BRIEF REPORT
Journal of Behavioral Addictions 5(4), pp. 708–714 (2016)
DOI: 10.1556/2006.5.2016.076
First published online November 14, 2016

The relationship between study addiction and work addiction: A cross-cultural longitudinal study

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(Received: May 7, 2016; revised manuscript received: September 14, 2016; accepted: October 1, 2016)

Aims: Recent empirical studies investigating "study addiction" have conceptualized it as a behavioral addiction, defined within the framework of work addiction. This study is the first attempt to examine the longitudinal relationship between study addiction and work addiction. *Methods:* The Bergen Study Addiction Scale (BStAS), the Bergen Work Addiction Scale (BWAS), and the Ten-Item Personality Inventory were administered online together with questions concerning demographics and study-related variables in two waves. In Wave 1, a total of 2,559 students in Norway and 2,177 students in Poland participated. A year later, in Wave 2, 379 Norwegians and 401 Polish who began to work professionally completed the survey. *Results:* The intraclass correlation between BStAS and BWAS revealed that the scores were somewhat related; however, the relationship was slightly weaker than the temporal stability of both constructs. In the Norwegian sample, scoring higher on neuroticism and lower on learning time outside educational classes in Wave 1 was positively related to work addiction in Wave 2, whereas gender was unrelated to work addiction in Wave 2 when controlling for other studied variables in either samples. *Conclusion:* Study addiction and work addiction appear to be closely related suggesting that the former may be a precursor for (or an early form of) the latter.

Keywords: longitudinal study, personality, study addiction, workaholism, work addiction

INTRODUCTION

Recent empirical studies have investigated and conceptualized "study addiction" as a new type of behavioral addiction (Atroszko, Andreassen, Griffiths, & Pallesen, 2015, 2016). More specifically, study addiction was conceptualized within contemporary theories of (and research into) "work addiction" (i.e., workaholism) and defined as "being overly concerned with studying, driven by an uncontrollable motivation to study, and investing so much time and effort into studying that it impairs private relationships, spare-time activities, and/or health" (see Andreassen, Hetland, & Pallesen, 2014, p. 8). While being cautious with overpathologizing excessive behaviors (Billieux, Schimmenti, Khazaal, Maurage, & Heeren, 2015; Maraz, Király, & Demetrovics, 2015), the authors argued that study addiction deserved focus as a potential behavioral addiction and a possible precursor for work addiction (Atroszko et al., 2015, 2016). From an addiction perspective, both behaviors appear to incorporate seven core addiction symptoms: salience, mood modification, tolerance, withdrawal, conflict, relapse, and problems (Andreassen et al., 2013; Atroszko et al., 2015; Brown, 1993; Griffiths, 2005). Furthermore, both behaviors show similar associations with other constructs, such as learning engagement/work engagement, longer time devoted to studying/working, lower academic/work performance, key personality traits (higher neuroticism and conscientiousness), and reduced psychological well-being (Andreassen, 2014; Andreassen & Pallesen, 2016; Atroszko et al., 2015), and appear to display comparable prevalence rates (Andreassen et al., 2014; Atroszko, 2015). Like work addiction, empirical investigations into study addiction have demonstrated high temporal stability (Andreassen et al., 2014; Atroszko, 2012).

To date, the longitudinal association between study addiction and work addiction has not been subjected to empirical testing. Consequently, the main aim of this study was to investigate whether study addiction is a precursor of work addiction. Even though it is assumed that there is a common addictive process underlying both study addiction and work addiction (Atroszko et al., 2015, 2016), situational factors weakening the association between the two behaviors have to be taken into account when investigating the relationship. For example, previous studies have found evidence for an interaction between person characteristics and work culture in predicting work addiction (Mazzetti, Schaufeli, & Guglielmi, 2014). In a broader perspective,

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seminal findings related to heroin addiction among U.S. Army soldiers during and after the Vietnam War clearly demonstrated how important environmental factors are in understanding addiction (Satel & Lilienfeld, 2013). Taking these factors into account, it seems that assessing work addiction at the beginning of the career of workers, following assessment of study addiction when they were students, is meaningful as it will provide data both on the strength of the relationship between study addiction and work addiction over time, and the role of environmental factors, in comparison with individual predispositions (e.g., personality), in the development of work addiction.

Previous research has shown that the amount of time devoted to studying outside educational classes predicts changes in study addiction 1 year later (Atroszko et al., 2016), which was consistent with the assumption that studying could be considered as a behavioral equivalent of "the drug of choice" for some individuals. Being female and scoring higher on neuroticism was related to an increase in study addiction over time in a Norwegian sample (Atroszko et al., 2016). The first finding was congruent with the "telescoping" effect (Greenfield, Back, Lawson, & Brady, 2010), and the second finding supported the notion that addictions (whether chemical or behavioral) initiate and then develop as a way of regulating mood (e.g., avoiding dysphoric moods) (Atroszko, 2015). These findings were also in line with studies suggesting that compared with men, women more often use specific substances or activities to self-medicate their depression and/or to reduce stress (Becker & Hu, 2008; Becker, Perry, & Westenbroek, 2012; Fattore, Melis, Fadda, & Fratta, 2014; Mitchell & Potenza, 2015). Lack of the relationship of gender and neuroticism with the escalation of study addiction in a Polish sample was attributed to the gender role differences related to labor market and attitudes to work between Norway and Poland (Fortin, 2005), as well as to a more direct relationship between overall academic performance and future job opportunities in Norway in comparison with Poland (Atroszko, 2013b; Atroszko & Atroszko, 2013; Atroszko et al., 2016). In general, there are worse professional options for graduates in Poland. A growing awareness of the difficulties in finding job congruent with education and competencies among students in their final years of studies may have caused them to partially withdraw their engagement from studying. This could have affected the relationship among gender, emotional stability, and work addiction.

In previous papers, the present authors described the theoretical and empirical basis for the relationships between study addiction and personality (see Atroszko et al., 2015, p. 76) and personality predictors of changes in study addiction (see Atroszko et al., 2016, p. 358 and p. 361). Based on this small literature base, and again using samples from countries where study addiction has been previously investigated (i.e., Norway and Poland), it was hypothesized that (a) study addiction and work addiction would be closely related, although the relationship would be somewhat weaker than the temporal stability of either of these constructs (H1); (b) time devoted to studying outside university classes would predict higher work addiction (H2); (c) neuroticism would predict higher work addiction in Norwegian but not Polish sample (H3); and (d) gender would predict work addiction (which would be higher in women) in Norwegian but not Polish sample (H4).

METHODS

Samples

Detailed information about the samples in Wave 1 and Wave 2 including the results of attrition analyses for both samples was published elsewhere (i.e., Atroszko et al. 2016).

Norwegian sample. The Norwegian sample comprised 2,559 students. In Wave 2, 1,560 students completed the survey (61% response rate). Among them were 379 participants (24.3%) whose main activity went from being educational study to a professional job. Of these, 69.4% were females and 30.6% were males, with a mean age of 30.15 years ($SD = 8.47$).

Polish sample. The Polish sample comprised 2,177 students. In Wave 2, 1,264 students completed the survey (58.1% response rate). Among them were 401 participants (31.7%) whose main activity went from being educational study to a professional job. This sample comprised 77.8% females and 22.2% males, with a mean age of 24.52 years ($SD = 3.82$).

Instruments

Demographics. At Wave 1, both samples were asked about their age and gender (coded as female = 0, male = 1), and to report the total number of hours they devoted weekly for studying at the college/university both in and outside of classes (e.g., at home or library) as well as information about whether they were working during their studies or not.

Work addiction. The Bergen Work Addiction Scale (BWAS) was used to assess work addiction in Wave 2 (Andreassen, Griffiths, Hetland, & Pallesen, 2012). It includes seven items that are based on core addiction components (Brown, 1993; Griffiths, 2005; Leshner, 1997). The questions concern symptoms experienced during the past 12 months. The responses are provided on a Likert scale ranging from *never* (1) to *always* (5). A one-factor solution has been found for the BWAS (Andreassen et al., 2012), and it has been translated into several languages and has demonstrated good reliability and validity across studies (Andreassen et al., 2012, 2013, 2014; Molino, 2012; Orosz et al., 2016). In Wave 2, the current Cronbach's α values were .85 and .84 in the Norwegian and Polish samples, respectively.

Study addiction. The Bergen Study Addiction Scale (BStAS) is an adaptation of the BWAS (Andreassen et al., 2012). The scale has demonstrated good construct validity (one-factor structure, content, concurrent and discriminant validity, and temporal stability) and reliability (internal consistency) in previous studies (Atroszko et al., 2015, 2016). In Wave 1, the current Cronbach's α values were .82 and .76 in the Norwegian and Polish samples, respectively. The initial study indicated measurement invariance for Norwegian and Polish versions of the scale (see Atroszko et al., 2015, p. 79).

Personality. The *Ten-Item Personality Inventory* (TIPI) was included in Wave 1 to assess the five-factor model of

personality (Gosling, Rentfrow, & Swann, 2003). The TIPI comprises 10 items that each is scored from *strongly disagree* (1) to *strongly agree* (7). Each dimension (Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Openness) is represented by two items. In this study, the Spearman–Brown coefficients for the five subscales were 78, .31, .53, .63, and .42 in the Norwegian sample and .70, .34, .69, .71, and .31 in the Polish sample. The scale also showed good reliability, and convergent and criterion validity in previous studies (Gosling et al., 2003).

Procedure

The procedure is described in more detail and has been published elsewhere (see Atroszko et al., 2016).

Statistical analysis

An intraclass correlation coefficient (ICC) using a two-factor mixed effects model and type consistency along with the 95% confidence interval (CI) was calculated as a measure of the relationship between study addiction and work addiction (McGraw & Wong, 1996). This coefficient follows the assumption that there is a common trait/entity underlying both study addiction and work addiction and in this case it is measured on different occasions and in reference to different circumstances, but with the same seven criteria for addiction. To examine the associations between the study-related variables, Pearson's product-moment correlation coefficients were calculated. Hierarchical multiple regression analyses were conducted with work addiction at Wave 2 as dependent variable for both samples. Gender, age, and study addiction at Wave 1 were entered as independent variables in Step 1 of the regressions. In Step 2, extroversion, agreeableness, conscientiousness, neuroticism, openness, and study time during classes and outside classes at Wave 1 were entered. Finally, working during studies at Wave 1 was entered in Step 3 to control its potential confounding effect on the relationship between study time and work addiction. All tests were two-tailed, and the significance level was set to $\alpha = .05$. For all linear regression analyses, preliminary analyses were conducted to ensure no violation of the assumptions of normality, linearity, multicollinearity, and homoscedasticity. All analyses were conducted using IBM SPSS.22.

Ethics

The study was carried out in accordance with the Declaration of Helsinki, and was approved by both the Norwegian Data Protection Official for Research and the Research Ethics Committee at the Institute of Psychology, University of Gdańsk in Poland. Completion of the questionnaires was regarded as providing consent.

RESULTS

Descriptive statistics

Table 1 presents mean scores and standard deviations for all study variables as well as their interrelationships in Norwegian and Polish samples.

Test–retest stability

The ICC was .50 (95% CI = .40–.60, $p < .001$) and .55 (95% CI = .46–.63, $p < .001$) for the Norwegian and Polish samples, respectively.

Predictors of work addiction

The regression analysis for work addiction in the Norwegian sample showed that the independent variables explained a total of 20% of the variance ($F_{11,365} = 8.30$, $p < .001$). Significant independent variables in Step 3 were study addiction at Wave 1 ($\beta = .34$), neuroticism ($\beta = .20$), study time outside classes at Wave 1 ($\beta = -.13$), and marginal study time ($p = .051$) during classes at Wave 1 ($\beta = -.10$) (see Table 2). The regression analysis for work addiction in the Polish sample showed that the independent variables explained a total of 18.7% of the variance ($F_{11,383} = 8.03$, $p < .001$). Only study addiction at Wave 1 ($\beta = .42$) was significant in Step 3 (see Table 2).

DISCUSSION

This study is the first to investigate the longitudinal relationship between study addiction and work addiction. Study addiction and work addiction were closely related, although the relationship was somewhat weaker than the temporal stability of either of these constructs (Andreassen et al., 2014; Atroszko et al., 2015). Therefore, Hypothesis 1 was supported. Since the study took place immediately after graduates had entered the labor market, there may be various factors related to situational characteristics abating the strength of relationship between study and work addiction scores, such as presence or absence of overwork climate in the workplace (Mazetti et al., 2014; cf. Satel & Lilienfeld, 2013). Likely, common method bias has to be taken into account. However, it cannot explain the whole relationship between study addiction and work addiction assessed over a 1-year interval. Furthermore, on the basis of previous studies into behavioral addictions (e.g., social media addiction, shopping addiction, exercise addiction, etc.) using scales based on 6–7 addiction criteria (based on seven core addiction symptoms: salience, mood modification, tolerance, withdrawal, conflict, relapse, and problems) (Brown, 1993; Griffiths, 2005) with similar wordings referring to different addictions, it is inferred that the common method bias does not fully explain the observed relationships. If that was the case, they should show similar – or at least moderately high – strength of associations, and clearly they do not correlate to that extent even when measured within the same cross-sectional survey. In addition, the correlations differ significantly depending on the particular addictions with some showing no correlations at all (e.g., Andreassen et al., 2013). Taking this into account (and within a broader framework of previous studies), the results provide some initial support for the general hypothesis that the study addiction may be a precursor for or an initial form of work addiction that might develop early in academic life while studying for important qualifications (Atroszko et al., 2015).

Table 1. Mean scores and standard deviations (*SDs*), percentages, and correlations (Pearson product-moment/point-biserial) between study variables in Norwegian ($n = 379$) and Polish ($n = 401$) samples

S. No.	Variable	Mean (*SD*)/ Percentage of Norwegian sample	Mean (*SD*)/ Percentage of Polish sample	1	2	3	4	5	6	7	8	9	10	11	12
1	Gender (0 = female, 1 = male)	69.4% females	77.8% females		–.02	–.25**	–.13*	–.08	–.22**	–.17**	–.26**	.05	.02	–.14**	.08
2	Age	28.99 (8.26)	23.55 (3.81)	.07		.05	–.06	.01	.05	.08	–.11*	.16**	–.30**	–.03	.23**
3	BStAS at Wave 1	16.1 (5.18)	16.53 (4.67)	–.13*	–.03		.34**	.03	–.08	.04	.28**	–.01	.18**	.34**	–.08
4	BWAS at Wave 2	14.6 (5.19)	16.43 (5.54)	–.03	.01	.39**		.01	–.13*	–.10*	.31**	–.02	–.02	.01	–.03
5	Extroversion	9.77 (2.89)	9.37 (2.84)	–.12*	.01	–.09**	.05		–.01	.03	–.14**	.26**	–.01	.01	–.01
6	Agreeableness	10.08 (1.96)	9.70 (2.27)	–.04	–.06	.11*	.01	–.02		.15**	–.16**	.14**	.10	.05	–.10
7	Conscientiousness	10.95 (2.09)	10.26 (2.51)	–.02	.08	–.03	–.07	.12*	.15**		–.18**	.01	.07	.10*	–.02
8	Neuroticism	6.30 (2.58)	7.80 (2.75)	–.14**	–.12*	.11**	.05	–.07	–.37**	–.29**		–.18**	–.02	.06	–.07
9	Openness	10.21 (2.06)	10.36 (2.08)	–.09	.03	–.02	.07	.38**	–.04	.18**	–.04		.06	–.06	.03
10	Study time at the university classes	18.47 (12.35)	17.64 (11.85)	–.05	.07*	.16**	–.05	–.04	–.04	.03	.10*	.05		–.08	–.29**
11	Study time at outside classes	10.05 (8.59)	10.05 (9.10)	–.01	–.04	.28**	.01	–.05	–.03	.12*	.02	.04	.37**		–.04
12	Work during studies[a]	46.4% working	62.3% working	–.03	.14**	–.02	.10*	.20**	.04	.05	–.20**	.06	–.24**	–.25**	

Note. Above diagonal are results for Norwegian sample and below diagonal are results for Polish sample. All variables except BWAS were assessed at Wave 1.
[a]0 = not working during studies, 1 = working.
*$p < .05$, **$p < .01$.

Table 2. Results of hierarchical multiple regression analyses, where demographic, study addiction, personality traits, and study-related variables at Wave 1 were regressed upon the work addiction score at Wave 2 across Norwegian ($n = 379$) and Polish ($n = 401$) samples

		Work addiction Wave 2 (Norway)		Work addiction Wave 2 (Poland)	
Step	Predictor	β	ΔR^2	β	ΔR^2
1	Gender (0 = female, 1 = male)	–.045	.123**	.024	.150**
	Age	–.073		.023	
	Study addiction at Wave 1	.333**		.389**	
2	Gender (0 = female, 1 = male)	–.029	.077**	.022	.033*
	Age	–.084		.020	
	Study addiction at Wave 1	.342**		.430**	
	Extroversion	.013		.058	
	Agreeableness	–.054		–.029	
	Conscientiousness	–.058		–.060	
	Neuroticism	.198**		–.008	
	Openness	.036		.082	
	Study time during classes at Wave 1	–.100		–.091	
	Study time outside classes at Wave 1	–.127		–.068	
3	Gender (0 = female, 1 = male)	–.028	.000	.025	.005
	Age	–.081		.011	
	Study addiction at Wave 1	.341**		.422**	
	Extroversion	.012		.047	
	Agreeableness	–.056		–.024	
	Conscientiousness	–.058		–.060	
	Neuroticism	.197**		.007	
	Openness	.036		.081	
	Study time during classes at Wave 1	–.105		–.080	
	Study time outside classes at Wave 1	–.128*		–.052	
	Work during studies[a]	–.020		.075	
	Total R^2		.200**		.187**

[a]0 = not working during studies, 1 = working.
*$p < .05$, **$p < .01$.

Time devoted to studying outside university classes was a predictor of work addiction, but only in the Norwegian sample, and the direction of the relationship was opposite to that hypothesized. Furthermore, even when controlling for non-study working at Wave 1, study time at the university during classes was negatively related to work addiction both in Norway and Poland. However, the effect was marginally statistically insignificant. Hypothesis 2 was therefore not supported. The fact that time spent for studying did not predict work addiction may suggest that time devoted to an activity alone is not itself a good indicator of an addiction, as time spent also may indicate healthy enthusiasm, which, for example, has been described in terms of video game engagement (Charlton & Danforth, 2010; Griffiths, 2010) and work engagement (Taris, Schaufeli, & Shimazu, 2010).

In line with Hypothesis 3 and previous findings (Atroszko et al., 2016), neuroticism predicted higher work addiction in the Norwegian, but not in the Polish, sample. These results may be cautiously interpreted as an outcome of a more direct relationship between overall academic performance and future job opportunities in Norway than in Poland. Unfavorable interplay of socioeconomic factors, academic pressures, and educational standards may influence learning and working attitudes, beliefs, and behaviors of Polish students (Atroszko, 2013a, 2013b; Atroszko & Atroszko, 2013; Atroszko et al., 2016). After graduation from university, many hard working, highly engaged Polish students with low emotional stability may find themselves working in a job that prevents them from high work engagement. It appears likely that these individuals may develop helplessness and/or hopelessness, and consequently may develop other behavioral or substance addictions in response to such a situation (Carpenter & Hasin, 1999).

Hypothesis 4, which stated that work addiction would be relatively higher for females than males in the Norwegian sample, was not supported. This means that after controlling for initial levels of study addiction and other independent variables, women did not develop work addiction more frequently than men – at least not immediately after finishing their academic studies. These results were partially consistent with the previous studies showing no relationship between work addiction and gender (Andreassen et al., 2014).

Strengths and limitations

Neither the Norwegian nor the Polish sample was representative putting restrictions on the generalizability to other populations. Furthermore, all data were self-reported, which is in turn open to the usual weaknesses of such data (social desirability bias, recall biases, etc.). On the other hand, this study comprised relatively large sample sizes providing high statistical power. Samples included students from both Norway and Poland thus allowing some degree of cross-cultural comparison. Furthermore, valid and reliable

measures of study addiction, work addiction, and personality were used. Finally, this study is the first to investigate the relationship between the study addiction and work addiction over time, relying on a longitudinal design. Consequently, this study significantly adds to the existing literature on behavioral addictions and provides further insights into the nature of study addiction and work addiction.

Conclusions and future research directions

Based on the findings in the present investigation, study addiction and work addiction appear to be closely related, although the relationship was somewhat weaker than the temporal stability of either of these constructs. These results provide some initial support for the general hypothesis that the study addiction may be a precursor for or an early form of work addiction. Time devoted to studying outside university classes was negatively related to work addiction in the Norwegian sample. As expected, neuroticism was positively related to work addition only in Norway, and gender was not related to work addiction. Further studies examining potential cultural and socioeconomic factors related to both study addiction and work addiction are necessary as some differences in results appeared across countries. More detailed investigation of the processes occurring during transition from studying educationally to working professionally should be conducted with reference to the relationship between study addiction and work addiction, and longitudinal studies across a longer time span should also be undertaken.

Funding sources: This research was partially funded by "Yggdrasil – young guest and doctoral researchers' annual scholarships for investigation and learning" (219026/F11) from Research Council of Norway to Dr. Pallesen and Mr. Atroszko. On the basis of decision number DEC-2013/08/T/HS6/00403, Paweł Andrzej Atroszko received funds from National Science Centre Poland within doctoral scholarship for preparing PhD dissertation.

Authors' contribution: PAA assisted with obtaining funding, literature search, study design and concept, data collection, statistical analyses, data interpretation, generation of the initial draft of the manuscript, manuscript preparation and editing, and final editing; CSA and MDG assisted with literature search, data interpretation, manuscript preparation and editing, and final editing; SP assisted with obtaining funding, literature search, study design and concept, data collection, statistical analyses, data interpretation, manuscript preparation and editing, and final editing.

Conflict of interest: The authors declare no conflict of interest.

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