

Personality and Social Psychology

Development of a work addiction scale

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Research into excessive work has gained increasing attention over the last 20 years. Terms such as “workaholism,” “work addiction” and “excessive work” have been used interchangeably. Given the increase in empirical research, this study presents the development of the Bergen Work Addiction Scale (BWAS), a new psychometrically validated scale for the assessment of work addiction. A pool of 14 items, with two reflecting each of seven core elements of addiction (i.e., salience, mood modification, tolerance, withdrawal, conflict, relapse, and problems) was initially constructed. The items were then administered to two samples, one recruited by a web survey following a television broadcast about workaholism ($n = 11,769$) and one comprising participants in the second wave of a longitudinal internet-based survey about working life ($n = 368$). The items with the highest corrected item-total correlation from within each of the seven addiction elements were retained in the final scale. The assumed one-factor solution of the refined seven-item scale was acceptable (root mean square error of approximation = 0.077, Comparative Fit Index = 0.96, Tucker-Lewis Index = 0.95) and the internal reliability of the two samples were 0.84 and 0.80, respectively. The scores of the BWAS converged with scores on other workaholism scales, except for a Work Enjoyment subscale. A suggested cut-off for categorization of workaholics showed good discriminative ability in terms of working hours, leadership position, and subjective health complaints. It is concluded that the BWAS has good psychometric properties.

Key words: Assessment, psychometrics, scale, work addiction, workaholism.

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INTRODUCTION

Originally, the expression “workaholism” stemmed from “alcoholism,” and was first introduced in academic literature as an “addiction to work, the compulsion or uncontrollable need to work incessantly” (Oates, 1971). Over the years further definitions of workaholism have been suggested, and terms such as “workaholism,” “work addiction” and “excessive work” have been used interchangeably. Most of the definitions describe workaholism as a chronic pattern of overindulgence in work, long working hours, working more than is demanded by implicit and explicit norms as well as self-absorption in work (e.g., Griffiths, 2011; Ng, Sorensen & Feldman, 2007; Porter, 1996; Robinson, 1998; Scott, Moore & Miceli, 1997; Spence & Robbins, 1992). However, certain differences in opinion do seem to exist concerning the construct of workaholism (Griffiths, 2005a). Some argue that workaholism is first and foremost a positive attribute or behavior tendency, encompassing high work motivation (Machlowitz, 1980; Scott *et al.*, 1997) whereas other researchers mainly emphasize the negative aspects of workaholism, such as compulsiveness and rigidity (Griffiths, 2011; Oates, 1971; Robinson, 1998; Schaufeli, Shimazu & Taris, 2009).

More recently, most researchers in the field have come to view workaholism primarily as a negative entity. For example, although both workaholics and engaged workers are heavily involved in work and work hard, work for the latter group is primarily fun, whereas workaholics are mainly motivated by a compulsive drive that is characteristic of almost any addiction (Taris, Schaufeli & Shimazu, 2010). Accordingly, Shimazu and Schaufeli (2009) regard workaholism as a “bad type” of working hard and work engagement as a “good type” of working hard. A more contem-

porary definition of workaholism is “the tendency to work excessively hard and being obsessed with work, which manifests itself in working compulsively” (Schaufeli *et al.*, 2009, p. 322). From an addiction perspective, workaholism can be defined as being overly concerned about work, being driven by an uncontrollable work motivation, and spending so much energy and effort on work that it impairs private relationships, spare-time activities and/or health.

To date, few measures of workaholism have been developed. Spence and Robbins (1992) developed the most frequently used measure of workaholism (i.e., the Workaholism Battery; Work-BAT). They argued that the typical workaholic is heavily involved in work, feels motivated to work by an inner drive, and has low enjoyment of work. In line with these ideas, they created three self-report scales assessing (1) work involvement; (2) drive; and (3) enjoyment of work. Potential items were first administered to students. Items showing poor psychometric properties were dropped or rewritten before the scale was administered to an adult sample. The WorkBAT comprises 25 items answered on a 5-point Likert scale ranging from “strongly disagree” to “strongly agree”. Although the WorkBAT is currently the most used measure of Workaholism, the Work Involvement subscale has in several studies failed to display appropriate psychometric properties (Kanai, Wakabayashi & Fling, 1996; McMillan, Brady, O’Driscoll & Marsh, 2002). The concept of the Enjoyment of Work subscale has been criticized by many researchers because it is not regarded as defining the characteristics of workaholism (Mudrack, 2006).

Although the first qualitative measure of workaholism was published by Machlowitz (1980), the first quantitative measure of work addiction or workaholism was the Work Addiction Risk

Test (WART), developed by Robinson (1989). Items were based on symptoms reported by clinicians working with both clients and families experiencing work addiction problems. Several studies by Robinson and his colleagues have attested to the psychometric properties of the WART (Robinson, 1996; Robinson & Phillips, 1995; Robinson & Post, 1994, 1995; Robinson, Post & Khakee, 1992). The total composite scores of the WART have been shown to be positively associated with scores on measures of anxiety and Type A behavior (Robinson, 1999).

The WART comprises 25 items, all rated on a 4-point Likert scale ranging from 1 (never true) to 4 (always true). Initially, the 25 items appeared to be distributed between five factors/subscales: (1) compulsive tendencies; (2) control; (3) impaired communication/self-absorption; (4) inability to delegate; and (5) self-worth. However, further investigation revealed that only 15 items, distributed across the three initial factors, were useful for correctly discriminating between workaholics and a control group. The authors concluded that the Compulsive Tendencies subscale was the most important in making this distinction, and suggested using the revised scale in future studies (Flowers & Robinson, 2002). However, the WART has been criticized for overlapping little with more contemporary and widely accepted views on workaholism (Mudrack, 2006).

More recently Schaufeli *et al.* (2009) developed a new workaholism scale. From a theoretical perspective, they argued that workaholics typically spend a great deal of time on work activities, and that additionally they are obsessed with their work. On this basis, they constructed the Dutch Workaholism Scale (DUWAS). The scale reflected these two dimensions, using five items from the Compulsive Tendencies Scale of the WART which they renamed Working Excessively, and five items from the Drive scale of the WorkBAT, which were denoted as Working Compulsively. The DUWAS has shown good psychometric properties in several studies (del Libano, Llorens, Salanova, & Schaufeli 2010; Schaufeli *et al.*, 2009).

However, because the concept of workaholism stems from the field of addiction, measures of workaholism or work addiction should be expected to be closely linked to the core elements of addictions (Griffiths, 2011). This stance is also emphasized by others such as Taris *et al.* (2010) who argue that the core feature of workaholism is a compulsive drive, which they regard as characteristic of any addiction. Critically, when reviewing the construction processes of the three aforementioned workaholism instruments, few of them have specifically been developed with the addiction perspective in mind and could be argued to lack face validity. According to Griffiths (1996, 2005b) all addictions, chemical as well as non-chemical, appear to comprise six core components: (1) salience (the activity dominates thinking and behavior); (2) mood modification (the activity modifies/improves mood); (3) tolerance (increasing amounts of the activity are required to achieve initial effects); (4) withdrawal (occurrence of unpleasant feelings when the activity is discontinued or suddenly reduced); (5) conflict (the activity causes conflicts in social relationships and other activities); and (6) relapse (tendency for reversion to earlier patterns of the activity after abstinence or control) (Griffiths, 1996, 2005b). In addition it has been argued that the addictive behavior normally represents some kind of health and/or other problem for the addict (Griffiths, 2005b; Leshner, 1997).

These seven elements of addiction are also closely in line with criteria for addiction and dependence to behaviors such as pathological gambling that can be found in formal diagnostic manuals (APA, 1994; WHO, 1992).

Given that etiology of the other scales was not grounded in the addiction field, a new scale for the assessment of workaholism or work addiction, named the Bergen Work Addiction Scale (BWAS), was constructed. The aim of the study was to develop a 7-item scale comprising one item representing each of the core elements of addiction outlined above. It was hypothesized (Hypothesis 1) that the new scale would show good psychometric properties in terms of factor structure (all loadings > 0.50, root mean square error of approximation (RMSEA) < 0.080, Comparative Fit Index (CFI) > 0.95, Tucker-Lewis Index (TLI) > 0.90). It was also expected (Hypothesis 2) that the new scale would correlate highly ($r > 0.50$) with the Drive subscale of the WorkBAT (given that drive and compulsion are core features of addiction in general). Further, it was expected (Hypothesis 3) that the new scale would show a moderately high correlation ($0.50 < r > 0.30$) with the Work Involvement subscale of the WorkBAT (as workaholism implies heavy work investment), and lower correlation (< 0.30) with the Enjoyment of Work Scale of the WorkBAT (as this is not a defining aspect of workaholism). It was further hypothesized (Hypothesis 4) that the BWAS would correlate highly ($r > 0.50$) with the Compulsive Tendencies subscale of the WART (as compulsion is a core feature of any addiction), and (Hypothesis 5) show moderate ($0.50 < r > 0.30$) correlations with the Control and the Impaired Communication/Self-Absorption subscales of the WART (as these may reflect heavy work investment).

Another aim was for the new scale to provide cut-off scores for categorization of workaholism. The creation of criteria and appropriate cut-off scores may add value to work addiction in theory and practice, particularly with regard to facilitating treatment and estimating prevalence of workaholism. In clinical contexts, a diagnosis is usually made when the person fulfils a fixed number of preset criteria. A cut-off score was explored implying relatively high scores on at least 4 of 7 criteria/items (i.e., a polythetic approach). Such an approach is common within the psychiatric nosology, where a diagnosis is given provided that the person fulfils a certain proportion (normally more than the half) of the single/specific criteria (APA (American Psychiatric Association), 1994; WHO (World Health Organization), 1992).

Previous research has shown that leaders as a group score higher on workaholism measures than do subordinates (Andreassen, Hetland & Pallesen, 2010). Furthermore, although number of hours of work is not an exclusive and/or defining aspect of workaholism, previous studies have shown positive relationships between workaholism and number of hours worked (Huang, Hu & Wu, 2010). Some of the earliest definitions of workaholism defined those who worked more than 50 hours a week as workaholics (Mosier, 1983). However, people can work excessive hours for many different reasons (e.g., marital problems, economic problems), without being addicted to it. In a recent paper, Griffiths (2011) specifically outlines the role of context in workaholism and shows through the use of case studies how someone could be working very long hours but not be classed as addicted because there are no negative consequences. Workaholism may also

involve thinking about work, even if not at work (i.e., preoccupation). Also, workaholism has previously been linked to subjective health complaints (Andreassen, Hetland, Molde & Pallesen, 2011). Against this background, it was expected (Hypothesis 6) that the proposed cut-off score would discriminate on a group level between respondents on the number of hours worked per week, leadership position, and subjective health complaints.

METHODS

Samples and procedures

Sample 1. The first sample was recruited to a web survey about workaholism following the broadcast of a feature about workaholism by a large nationwide television station in Norway. Workaholism was portrayed in a neutral and balanced way in the broadcast, in which the first author presented and commented. The program was broadcasted on a Saturday at 6.50 p.m. and typically viewed by approximately 400,000 viewers. Beside basic demographic variables, no further information about the sample is known. At the end of the feature, viewers were invited to participate in a web-based survey by accessing the television station's web pages (<http://www.tv2.no>), where a link to the web survey was provided. The survey was administered by SurveyXact (<http://www.surveyxact.no>). All responses to the survey were stored on a server administered by this company. After one month, the data were retrieved and SurveyXact sent an Excel file containing all the collected data to the research team. A total of 11,769 participants (7,596 men and 4,172 women) completed the survey. In terms of leadership position, 2,472 were top-level managers, 2,694 were mid-level managers, 2,966 performed other managerial functions, and 3,637 had no managerial duties at all. The mean age of the sample was 40.4 years ($SD = 11.6$ years). The mean total hours worked per week (including overtime, secondary jobs, and other paid and unpaid jobs but excluding domestic chores) for the whole sample was 46.8 hours ($SD = 18.5$ hours). Attaining informed consent was not regarded as necessary by the Regional Committee for Medical and Health Research Ethics in Western Norway as no intervention was conducted and because all data were collected anonymously. To optimize the response rate, the survey contained as few questions as possible, and far less than was given to the second sample (see below).

Sample 2. The second sample comprised 368 participants (175 men and 193 women) with a mean age of 46.4 years ($SD = 10.1$ years), who participated in the second wave of a longitudinal internet-based survey about working life (leadership, personality, basic work needs, workaholism, work-family spillover, health and well-being). The first wave was conducted in 2007–2008 with the second wave conducted about 24–30 months later. Before initiating the study, meetings were arranged at which the leaders of invited organizations were informed about the investigation. Information was given in advance to all potential respondents about the aims and objectives of the study (by the chief executive officers of the organizations by electronic mail). Questionnaires given in wave 1 and wave 2 were quite similar, although wave 2 contained more workaholism measures and fewer of the other measures involved in wave 1. In the first wave, a total of 661 people participated, yielding a response rate of 55.7% in the second wave. The respondents were invited to register their e-mail addresses so that the researchers could contact them for a second survey within the next 24–30 months. The datasets were merged so that responses to wave 1 could be aligned with responses from wave 2 for each single individual. The sample in wave 2 comprised leaders of a major pharmaceutical company ($n = 63$), and employees from a regional healthcare sector company ($n = 57$), a national television station ($n = 87$), two different human resources consultancy companies ($n = 41$), and two university faculties ($n = 120$). Out of the 368 participants, 46 were top-level managers, 93 were mid-level managers, 63 performed other managerial duties, and 163 had no mana-

gerial duties at all. The Regional Committee for Medical and Health Research Ethics in Western Norway approved the study.

Instruments

Demographics. Questions about age and gender were asked. Respondents were also asked to provide an estimate of the total number of hours worked every week including overtime, secondary jobs, and other paid and unpaid jobs except for domestic chores. Respondents were asked to categorize the level of their position within the organization where they worked as either (1) top-level manager; (2) mid-level manager; (3) other manager functions; or (4) no managerial duties. These questions were asked to both samples 1 and 2.

The Bergen Work Addiction Scale (BWAS). Potential items to be included in the BWAS were created by adhering to the 7 components of addiction referred to above. For each of these components, two items were constructed, yielding an initial pool of 14 potential items. Wording similar to the diagnostic criteria for addiction were used (APA (American Psychiatric Association), 1994; WHO (World Health Organization), 1992) as well as to that of scales measuring other forms of non-chemical addiction (Gerstein, Hoffman, Larison *et al.*, 1999; Lemmens, Valkenburg & Peter, 2009). Each item is rated on a 5-point Likert scale ("never", "rarely", "sometimes", "often" and "always") (e.g., "How often during the last year have you worked so much that it has negatively influenced your health?"). The items in the BWAS were administered to both samples 1 and 2.

The Work Addiction Risk Test (WART). A reduced version was used, as validated and recommended by its creators, of the original WART scale (Flowers & Robinson, 2002). The reduced scale comprised 15 items, each answered on a 4-point Likert scale. It comprised three subscales: Compulsive Tendencies (9 items; e.g., "I seem to be in a hurry and racing against the clock"), Control (4 items; e.g., "I lose my temper when things don't go my way or work out to suit me") and Impaired Communication/Self-Absorption (2 items; e.g., "I ask the same question over again, without realizing it, after I've already been given the answer once"). The reduced WART was only administered to sample 2. The Cronbach's alphas for the three subscales in the present study were 0.76, 0.69 and 0.54, respectively. The Control and Impaired Communication/Self-Absorption subscales had low alphas. However, it should be noted that these subscales only consisted of 4 and 2 items, and a high Cronbach's alpha could therefore not be expected.

The Workaholism Battery (WorkBAT). The WorkBAT comprises 25 items scoring on three subscales: Work Involvement (8 items; e.g., "I like to use my time constructively, both on and off the job"), Drive (7 items; e.g., "I feel guilty when I take time off work") and Enjoyment of Work (10 items; e.g., "I do more work than is expected of me strictly for the fun of it"). Each item is rated on a 5-point Likert scale (Spence & Robbins, 1992). The Cronbach's alphas for the three subscales in the present study were 0.65, 0.82 and 0.83, respectively. It should be noted that the Work Involvement subscale in its original form has also proven to have low reliability across studies, and therefore should be used with caution. WorkBAT was administered to sample 2 only.

Subjective Health Complaints (SHC). The SHC questionnaire comprises 22 items, distributed across the three most used subscales. Each item describes a specific health complaint, with the respondents instructed to estimate the extent to which they have been bothered by that complaint over the last 30 days, along a 4-point Likert scale ranging from "not bothered at all" to "seriously bothered" (Eriksen, Ihlebæk & Ursin, 1999). The three subscales were: Musculoskeletal Complaints (8 items), Pseudoneurological Complaints (7 items: tiredness, sleeplessness, depression, anxiety, hot flushes, palpitations, dizziness) and Gastrointestinal Complaints (7 items). The Cronbach's alphas for the three subscales in the present study were 0.79, 0.75 and 0.70, respectively. The SHC was only administered to sample 2.

Statistics

Item selection. Sample 1 was divided into two nearly equal-sized subsamples by a randomized selection procedure performed by the PASW, version 18.0. The first subsample ($n = 5,932$) was used to pick 7 out of the 14 BWAS items for inclusion in the final scale. One item within each pair of items was retained (one pair of items was constructed for each aspect of addiction) with the highest corrected item-total correlation with the other 13 items. This ensured that the final scale reflected all the 7 core aspects of addiction.

Factor analyses. The goodness of fit of this model was then investigated in a confirmatory factor analysis (CFA) using AMOS, version 18.0, based on the other half of the sample ($n = 5,837$). A one-factor solution was expected. The error terms of each indicator were assumed to be uncorrelated with each other. The RMSEA, the CFI and the TLI were used as fit indexes. As a rule of thumb, for a model with acceptable fit to the data these indexes should be < 0.08 , > 0.90 and > 0.90 respectively, whereas the corresponding values for a good fit would be < 0.06 , > 0.95 and 0.95 respectively (Hu & Bentler, 1999).

The final BWAS, comprising 7 items, was then subjected to a new CFA based on data collected for sample 2. Here, the correlation coefficients between the following latent factors were calculated (the BWAS, Work Involvement, Drive, Work Enjoyment, Compulsive Tendencies, Control and Impaired Communication/Self-Absorption) in order to investigate the convergent and discriminative validity of the BWAS. All error terms for the indicators were assumed to be unrelated to each other, but correlation paths were drawn between all the latent constructs.

Cut-off score analyses. With regard to setting a cut-off score for categorization of workaholics, the use of a criterion requiring a score of at least four ("often" or "always") on at least 4 out of 7 BWAS items was explored by investigating with a t-test for independent samples whether participants scoring below or above this cut-off reported a significantly different number of working hours per week. Due to the number of working hours previously being linked to workaholism, it was also investigated whether scoring "often" or "always" on a given number of the BWAS items (0–7) was related to a difference in total working hours by use of a one-way ANOVA (with a Bonferroni-corrected post hoc test). Using chi-square analysis, it was further investigated whether leadership position was related to a score above or below the abovementioned cut-off point for workaholism. All these cut-off-related analyses were conducted using data from sample 1. In addition, it was investigated whether a score above or below the suggested cut-off (scoring "often" or "always" on at least 4 of 7 BWAS items) was related to different levels of subjective health complaints, by conducting a one-way ANOVA with gender as a covariate. The latter analysis was conducted using data from sample 2. Finally the correlation coefficient between the total BWAS score and the total working hours in both samples 1 and 2 was investigated, as this was measured in both samples.

RESULTS

Factor analyses

The 7-item BWAS model investigated in half of sample 1 ($n = 5,837$) had an acceptable fit (Minimum value of the discrepancy function divided by degrees of freedom (CMIN/DF) = 35.6, RMSEA = 0.077 (90% confidence interval (CI) = 0.071–0.083), CFI = 0.96, TLI = 0.95). The standardized regression weights ranged from 0.50 to 0.73. Figure 1 shows the model, errors and standardized regression weights for each of the 7 items. The Cronbach's alphas for the BWAS in samples 1 and 2 were 0.84 and 0.80 respectively.

The CFA investigating the correlations between the different latent workaholism subscales showed only a mediocre fit (CMIN/

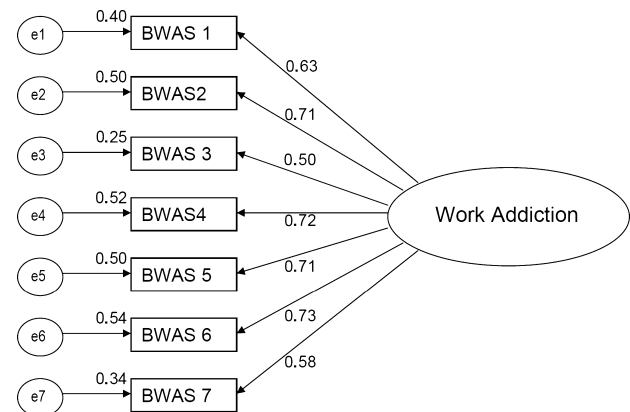


Fig. 1. The factor structure and the standardized loadings of the items on the Bergen Work Addiction Scale.

DF = 2.51, RMSEA = 0.066 (95% CI = 0.063–0.070) CFI = 0.71, TLI = 0.69), as the measurement model for the three single workaholism scales did not provide very good fit indexes: the BWAS, WorkBAT and WART had CFI-values of 0.89, 0.73 and 0.83, respectively. The latent BWAS variable had the following correlations with the other latent workaholism subscales: $r = 0.13$ (Enjoyment of Work), 0.35 (Work Involvement), 0.65 (Drive), 0.84 (Compulsive Tendencies), 0.50 (Control) and 0.70 (Impaired Communication/Self-Absorption). Table 1 shows the correlation coefficients between all the 7 latent workaholism subscales.

The one-way ANOVA showed (see Table 2) an almost linear relationship between the number of items (0–7) endorsed (responding with "often" or "always") and mean number of total hours worked per week ($F_{7,11756} = 173.4$, $p < 0.01$). The post hoc test revealed significant differences ($p < 0.05$) between all groups categorized by number of items endorsed and mean number of total working hours, except between the groups endorsing 3 and 4 items ($p > 0.05$) and those endorsing 5 and 6 items ($p > 0.05$). When investigating the suggested specific cut-off (endorsing at least 4 items) in particular, a total of 30.1% of the participants in sample 1 were categorized as workaholics. Those categorized as workaholics reported total weekly work hours to be 53.0 (SD = 19.6 hours) whereas those not categorized as workaholics reported total weekly work hours to be 44.1 (SD = 17.4 hours) ($t = 24.7$, $df = 11,762$, $p < 0.01$). Furthermore, results (see Table 3) showed the frequency of workaholics to be positively related to leadership position ($\chi^2 = 444.9$, $df = 3$, $p < 0.01$).

Out of sample 2, a total of 7.4% were categorized as workaholics. Those categorized as workaholics had significantly higher scores on all subjective health complaints (all $p < 0.01$), as compared to those not categorized as workaholics. For Musculoskeletal Complaints ($F_{1,338} = 30.5$) the scores were 7.87 vs. 3.74, for Pseudoneurological Complaints ($F_{1,338} = 18.3$) the scores were 5.15 vs. 2.71, and for Gastrointestinal Complaints ($F_{1,337} = 12.4$) the scores were 3.83 vs. 2.05, respectively.

The correlation coefficients between the total BWAS score and the total working hours per week were 0.32 ($p < 0.01$) in sample 1 and 0.31 ($p < 0.01$) in sample 2.

Table 1. Correlation coefficients between the seven latent workaholism (sub)scales (n = 342)

	WorkBat Work Enjoyment	WorkBat Work Involvement	WorkBat Drive	WART Compulsive Tendencies	WART Control	WART Impaired Communication/Self-Absorption
The Bergen Work Addiction Scale	0.13*	0.35**	0.65**	0.84**	0.50**	0.70**
WorkBat		0.19**	0.01	0.21**	0.04	0.27**
Work Enjoyment						
WorkBat			0.42**	0.53**	0.06	0.12*
Work Involvement						
WorkBat				0.72**	0.48**	0.52**
Drive						
WART					0.70**	0.73**
Compulsive Tendencies						
WART						0.63**
Control						

Notes: * p < 0.05; ** p < 0.01.

Table 2. Number of items of the Bergen Work Addiction Scale endorsed, mean and standard deviations of total hours of work per week and comparisons of working hours across groups endorsing 0 to 7 criteria

Number of items endorsed	N	Total weekly working hours mean (SD)	Significant differences with number of items given in the first column
0	2,892	38.8 (15.6)	< 1–7 items endorsed ^a
1	1,891	43.7 (17.4)	> 0 < 2–7 items endorsed ^a
2	1,790	47.7 (17.5)	> 0–1 < 3–7 items endorsed ^a
3	1,649	50.0 (17.6)	> 0–2 < 5–7 items endorsed ^a
4	1,422	50.5 (18.1)	> 0–2 < 5–7 items endorsed ^a
5	1,114	53.6 (19.1)	> 0–4 < 7 items endorsed ^a
6	671	54.5 (20.7)	> 0–4 < 7 items endorsed ^a
7	335	58.6 (23.0)	> 0–6 items endorsed ^a

^a Bonferroni corrected post hoc tests.

DISCUSSION

This discussion begins by commenting on the content validity of the BWAS. This form of validity is based on comparing the content of the measures with the universe of content defining the construct (Cozby, 2009). As the BWAS was constructed specifically for each of the 7 core elements of addiction to be represented (see Table 4), it can be argued as having relatively high content validity in terms of the addiction field. Ng *et al.* (2007) further

Table 3. The relationship between leadership position and categorization as workaholic or not workaholic (n = 11,769)

Leadership position	N	Percentage categorized as workaholic	Percentage categorized as not workaholic
No manager functions	3,637	20.3	79.7
Other manager functions	2,966	26.9	73.1
Mid-level manager	2,694	33.4	66.6
Top-level manager	2,472	44.7	55.3

argue that workaholism covers three dimensions: affects, cognitions and behavior. Consequently, an instrument measuring workaholism should include each of these aspects as well. When inspecting the items of BWAS, at least two items (“worked in order to reduce feelings of guilt, anxiety, helplessness and depression” and “become stressed if prohibited from working”) reflect the affective domain. Such items are in line with the notion that some workaholics overindulge in work in order to escape from personal problems, for example a troubled marriage (Mackenzie, 1997). The cognitive element of workaholism is probably best reflected by item 1 (“thought of how you could free up more time to work”), in line with the suggestion that workaholism involves persistently thinking about work (Scott *et al.*, 1997). The behav-

Table 4. The Bergen Work Addiction Scale (BWAS)

Instructions: Below you find seven questions related to your work/job. Answer each of the seven questions by selecting the one response alternative (ranging from “never” to “always”) for each question that best describes you. How often during the last year have you ...

Item	Wording	Addiction component
BWAS1	Thought of how you could free up more time to work?	Saliency
BWAS2	Spent much more time working than initially intended?	Tolerance
BWAS3	Worked in order to reduce feelings of guilt, anxiety, helplessness and depression?	Mood modification
BWAS4	Been told by others to cut down on work without listening to them?	Relapse
BWAS5	Become stressed if you have been prohibited from working?	Withdrawal
BWAS6	Deprioritized hobbies, leisure activities, and exercise because of your work?	Conflict
BWAS7	Worked so much that it has negatively influenced your health?	Problems

Notes: All items are scored along the following scale: “never” = 1, “rarely” = 2, “sometimes” = 3, “often” = 4, “always” = 5.

ioral domain constitutes, according to Ng *et al.* (2007), long working hours as well as the intrusion of work into personal life. Both these aspects are covered by the BWAS (“spent much more time working than initially intended” and “deprioritized hobbies, leisure activities, and exercise because of your work”). Hence, the BWAS seems to have high content validity, both in terms of the addiction construct and in accordance with the affective, cognitive and behavioral dimensions of workaholism. However, it might be the case that some other items could have better reflected the workaholism universe/construct.

With regard to the factor structure of the BWAS, our hypothesis (Hypothesis 1) of a reasonably good fit with the data was supported as all standardized factor loadings were above 0.50, with an RMSEA of 0.077, a CFI of 0.96 and a TLI of 0.95. The fit indexes indicate that the BWAS scores reflected one dimension, workaholism, despite the scale being based on several theoretical sub-elements. The BWAS could, of course, have been expanded extensively in line with these, adding further items in order to yield subscales or sub-dimensions. However, the aim was to develop a short scale in order to facilitate its use in epidemiological as well as in clinical contexts. Researchers within the field of workaholism have also argued against the use of multidimensional workaholism scales (Mudrack, 2006) and to the best of the authors’ knowledge this article is the first to construct a unidimensional scale.

In order to investigate the convergent and discriminative validity of the BWAS, the correlation of its latent score with those of two other workaholism scales (i.e., the WorkBAT and the WART) was investigated. It was expected (Hypothesis 2) that the BWAS would correlate highly ($r > 0.50$) with the Drive subscale of the WorkBAT, to correlate moderately ($0.50 < r > 0.30$) with the Work Involvement subscale of the WorkBAT, and to show a low correlation with the Enjoyment of Work subscale of the WorkBAT. This hypothesis was supported by the data as the correlation coefficients were 0.65, 0.35 and 0.13, respectively. The Drive scale mainly reflects items in line with feeling driven to work. This finding resonates well with the BWAS being rooted in an addiction paradigm, given that most addictions have strong elements of drive and compulsion (Volkow & Fowler, 2000).

The moderate correlation of the scale with the Work Involvement subscale was expected as involvement in work is a core feature of workaholism (Ng *et al.*, 2007). The BWAS showed only a weak correlation with Enjoyment of Work. This was expected because the BWAS was not intended to distinguish between workaholics on the basis of enjoyment of work. Although this dimension is incorporated in the WorkBAT (Spence & Robbins, 1992), several authors have recently emphasized its irrelevance to the workaholism construct (Mudrack, 2006; Schaufeli *et al.*, 2009), and the BWAS appears to be in line with this perspective. It should also be mentioned that in previous studies, the Enjoyment of Work and Drive subscales of the WorkBAT have shown directly opposite relationships with other constructs such as life satisfaction and health (Andreassen *et al.*, 2011; Andreassen *et al.*, 2010), clearly suggesting that Enjoyment of Work and Drive do not reflect the same construct.

It was expected (Hypothesis 3) that the BWAS would correlate highly ($r > 0.50$) with the Compulsive Tendencies of the WART. The correlation coefficient was 0.84 and indicates, in line with the

association between the BWAS and the Drive subscale of the WorkBAT, that the BWAS to a large extent reflects the compulsive aspects of working excessively. It is also consistent with the finding of Flowers and Robinson (2002) that out of the subscales, Compulsive Tendencies is the most important in terms of discriminating between workaholics and controls. However, the high correlation coefficient between BWAS and WART Compulsive Tendencies could also indicate that the WART subscale and BWAS measure are not sufficiently distinct. However, the authors believe that the BWAS has an important and novel contribution to the field of workaholism, as it has measures strongly rooted in addiction theory. Concerning the high correlation coefficient between the BWAS and the Compulsive Tendencies subscale of the WART, it should also be noted that the constructs represent latent variables, and thus a somewhat high correlation coefficient should be expected.

The BWAS was expected (Hypothesis 4) to show a moderately ($0.50 < r > 0.30$) high correlation with the Impaired Communication/Self-Absorption subscale of the WART. Unexpectedly, this hypothesis was not supported as the correlation coefficient was much larger than expected, at $r = 0.70$. The Impaired Communication/Self-Absorption subscale comprises two items reflecting the use of more energy on work than on family, as well as forgetting about important family matters. These two items are clearly related to the core addiction element of conflict. This conceptual overlap may thus explain the high correlation reported here. The BWAS was expected (Hypothesis 5) also to show a moderately high correlation ($0.50 < r > 0.30$) with the control subscale of the WART. The correlation coefficient was 0.50 and the hypothesis was not directly supported. The Control subscale reflects impatience, irritability and experienced time pressure. The BWAS does not contain any items pertaining directly to these aspects. However, many workaholics are characterized by these features (Robinson, 1999) and the high correlation between the BWAS and the Control subscale of the WART probably reflects some underlying conceptual commonality between the two.

Overall, the data discussed here suggest that the BWAS has adequate convergent and discriminative validity.

Finally, it was expected (Hypothesis 6) that a tentative cut-off (scoring “often” or “always” on at least 4 of the 7 BWAS items) would differentiate between workaholics and non-workaholics. An almost linear relationship was found between the number of items on the BWAS with scores in this range and the total number of working hours. The suggested cut-off of 4 differentiated well between participants in terms of working hours. The continuous score of the BWAS also showed a moderately high correlation with self-reported number of hours worked per week.

Overall, the findings presented here are all in line with suggestions of a strong link between the number of hours worked, and workaholism (Machlowitz, 1980; Porter, 1996). Using a cut-off of 4 (out of 7) yielded a large difference between sample 1 and sample 2 in terms of the percentage classified as workaholics (30.1% vs. 7.4%). This probably reflects the fact that sample 1 comprised a non-probability sample specifically recruited to a survey about workaholism, making it likely that self-selection bias inflated the sample’s prevalence of workaholics (Rea & Parker, 2005).

As previous studies on workaholism have shown a positive association between workaholism scores and leadership position

(Andreassen *et al.*, 2010), it was expected that the proposed cut-off would yield a higher prevalence in leaders than in subordinates. Data supported this hypothesis. As workaholism is assumed to be associated with poorer health than is non-workaholism (Andreassen *et al.*, 2011), it was also expected that participants classified as workaholics by the proposed cut-off would report higher levels of subjective health complaints. The data clearly supported this hypothesis. Overall, the suggested cut-off seems well founded from both clinical and empirical points of view, suggesting that the BWAS has good discriminative validity.

The evaluation of the psychometric properties of the BWAS was prohibited by the lack of a gold standard against which to evaluate the suggested cut-off value, from conducting more advanced analyses, for instance, based on receiver operating characteristics (Akobeng, 2007). Thus, the usefulness of our proposed cut-off value for categorization of workaholism should be further explored in future studies. It should also be pointed out that for most addictions, a diagnosis (or categorization) is made when the person fulfils a given number of criteria (e.g., 5 out of 10 for pathological gambling, 3 out of 7 for substance dependence) (APA (American Psychiatric Association), 1994), and our suggested cut-off of 4 out of 7 criteria is in line with this general approach. It is not suggested that more emphasis or weight should be put on certain items than others, which is also consistent with most formal diagnostic procedures (APA (American Psychiatric Association), 1994; WHO (World Health Organization), 1992). However, it should be emphasized that at present, workaholism is not an accepted diagnosis in psychiatric nosology. Thus, the categorization should not be equated with pathology according to psychiatric standards.

Overall, it is concluded that the BWAS is the first unidimensional scale for the assessment of workaholism/work addiction (given results from the CFA and high Cronbach's alpha). The scores derived from the BWAS may be used as a continuous variable or as a dichotomous variable for classifying individuals as workaholics or non-workaholics. Based on the work carried out to date, the scale appears to have relatively high content validity and an adequate factor structure, and shows high convergent and discriminative validity. However, this is only the first part of the psychometric construction process and further work is needed to confirm the adequacy of the psychometric properties.

LIMITATIONS

Due to the methodology, especially in terms of sampling and the lack of information about viewers and non-respondents, it is not known whether the samples are representative, and whether the data can be generalized to other populations. The fact that most of the respondents in the present study were recruited following a television feature about workaholism may have influenced the sample. Thus, the results from the present study cannot without reservations be generalized to other populations.

The fact that a far higher percentage of the respondents in sample 1 compared to sample 2 were categorized as workaholics further suggests that this may be the case. This study also relied on single-source self-report data, which always entails the possibility of common method bias. Also, the correlation coefficients between the measures, especially BWAS and WART Compulsive Tendencies, are of a magnitude which could suggest too large a

conceptual overlap. Furthermore, there are not enough data yet to substantiate workaholism as a "disorder" with equivalence to psychiatric diagnoses. Additionally, the cut-off score procedure and threshold may be problematic as it risks the high incidence of type I errors, and may represent a potential confound.

It should also be noted that there was a relatively long time period (two years plus) over which the data were collected. The global financial crisis that occurred during this period may have led to different working hour patterns by some participants in wave 2 (i.e., post-financial crisis). This may have possibly had some impact on the current validation data, and the generalizability to other samples.

From a psychometric design perspective, some authors (e.g., Anastasi & Urbina, 1997; Nunnally, 1978) argue that content validation is only adequately established when the content is cross-checked by independent means (e.g., multi-rater kappa coefficients using subject matter experts). Some approaches include a two-stage protocol, where a panel of content experts evaluate the instrument and rate item relevance to the domain of content. It should also be noted that having only one item per construct may have potentially negatively impacted on properties such as alpha values and distribution variance.

Future research direction

Given the brevity of the new scale, this will be of help in future studies that examine workaholism. Such studies should evaluate the scale in other populations (e.g., in other cultures and nations, and across different occupations). It also needs to be determined to what extent the BWAS is adequately distinguished from already existing measures (e.g., DUWAS). Furthermore, future studies should investigate whether workaholism should be considered as a continuous entity (including abuse and dependence) or as a dichotomized variable. Further investigation of criteria and development of appropriate cut-off scores based on, for example, normative data/samples may add value to workaholism in theory and practice, particularly with regard to facilitating treatment and estimating the prevalence of workaholism among different groups and populations.

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