

Workaholism in the Netherlands: Measurement and Implications for Job Strain and Work–Nonwork Conflict

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Cette recherche traite de la mesure et des conséquences du travail comme conduite addictive aux Pays-Bas. La première étude décrit le développement et la validation d'une version hollandaise de la Work Addiction Risk Scale (WART) de Robinson (1999). Une analyse factorielle portant sur les réponses de 356 sujets a montré que la structure factorielle de la WART hollandaise était analogue à celle de la version américaine. La deuxième étude ($N = 232$) avait pour objectif de décider si la sous-échelle «tendances compulsives» (CT) de la WART pouvait être utilisée comme mesure abrégée du travail addictif. Le recouvrement entre l'échelle complète de 25 items et la sous-échelle CT était large et la répartition des corrélations avec les autres concepts très proche. La troisième étude ($N = 199$) mit à l'épreuve un modèle des effets du travail addictif (CT) sur l'épuisement et le conflit travail—hors-travail, montrant que le travail addictif affectait ces deux variables dépendantes à la fois directement et indirectement (par l'intermédiaire des exigences perçues du travail). On conclut 1) que la version hollandaise de la WART

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est très proche de la version américaine d'origine; 2) que la WART et la sous-échelle CT sont toutes deux des mesures valides du travail addictif; 3) que le travail addictif est un concept virtuellement majeur pour l'étude du travail et du stress.

This research deals with the measurement and consequences of workaholism in the Netherlands. Study 1 describes the development and validation of a Dutch version of Robinson's (1999) Work Addiction Risk Scale (WART). Confirmatory factor analysis (total $N = 356$) revealed that the factorial structure of the Dutch WART was similar to that of the US original. Study 2 ($N = 232$) examined whether the Compulsive Tendencies (CT) subscale of the WART could be used as a short measure of workaholism. The overlap between the full 25-item WART and the CT subscale was high, whereas the patterns of correlations with other concepts were very similar. Study 3 ($N = 199$) tested a process model for the effects of workaholism (i.e., CT) on exhaustion and work–nonwork conflict, showing that workaholism affected these two outcome variables both directly and indirectly (via perceived job demands). It is concluded that: (i) the Dutch version of the WART is very similar to the US original; (ii) the WART and the CT subscale are both valid measures of workaholism; and (iii) workaholism is a potentially important concept in the study of work and stress.

INTRODUCTION

The term *workaholism* has been part of our everyday vocabulary since it was coined by Oates (1971). Given the widespread use of this term among lay people, it is remarkable that our scientific understanding of workaholism is still quite limited (McMillan, O'Driscoll, & Burke, 2003). According to Burke (2001a), "much of the writing [on workaholism] has not been guided by a clear definition of the concept or by well-developed measures" (p. 65). For example, whereas many writers consider workaholism as a negative condition that has adverse effects on health, personal relationships and general well-being (e.g. Oates, 1971; Porter, 2001), others construe workaholism as a state with positive consequences for both workaholics and the organizations they work for (Machlowitz, 1980; Peiperl & Jones, 2001), or distinguish positive forms of workaholism ("enthusiastic workaholics") besides negative forms (Spence & Robbins, 1992).

Fortunately, as Burke (2001a) observes, the conceptual fog regarding the definition and measurement of workaholism is beginning to clear, and several measures of workaholism have emerged. The present paper reports the results of three interrelated studies on the development and validation of the Dutch version of one of these, namely Robinson's (1999) Work Addiction Risk Test (WART). Study 1 addresses the internal validity of the Dutch version of the WART, aiming to replicate the factor structure of the original US version (Flowers & Robinson, 2002). Evidence on the cross-cultural generalizability of previous findings on workaholism is important, as no less

than 75 percent of the research on workaholism employed US samples (McMillan, O’Driscoll, Marsh, & Brady, 2001). Consequently, our understanding of workaholism runs the risk of becoming culturally biased. For instance, Kanai, Wakabayashi, and Fling (1996) examined a US workaholism scale (Spence & Robbins, 1992, Workaholism Battery) among Japanese employees and concluded that this scale needs to be re-examined because of “. . . workaholic behaviors unique to the Japanese people and their work organizations” (p. 202). Study 2 examines whether workaholism (as measured by the WART) should be considered a multi-dimensional phenomenon, or whether a simpler conceptualization in terms of one of its subscales suffices. By examining the patterns of the correlations between two measures of workaholism and other concepts Study 2 also contributes to the external validation of the WART and its shorter derivative. Finally, Study 3 proposes and tests a model for the effects of workaholism on burnout and work–nonwork conflict in a sample of middle managers. By examining workaholism in the context of a process model that specifies the relationships between workaholism on the one hand and poor health and work–nonwork conflict on the other, our understanding of work addiction can be furthered.

Workaholism: Conceptualization and Findings

Various conceptualizations and definitions of workaholism have been proposed. At the heart of these definitions lies the idea that workaholics are people who work excessively hard, which agrees with the popular definition of workaholism (Burke, 2001a). However, the motivation for working long and hard may differ across persons; it might result from a strong inner drive—which is considered the root cause of workaholism—but also from external, contextual factors such as financial problems, a poor marriage, the organizational culture, or a strong desire for career advancement. Thus, simple measures of workaholism in terms of the number of hours people spend on their work are conceptually flawed. Current conceptualizations therefore also include the motivation for working excessively hard and long.

In their synthesis of earlier theory and research, Scott, Moore, and Miceli (1997) mentioned three features of workaholism. The first of these is that workaholics “. . . spend a great deal of time in work activities when given the discretion to do so, which results in their giving up important social, family or recreational activities because of work” (p. 292). This is consistent with earlier definitions that define workaholism as “the compulsion or the uncontrollable need to work incessantly” (Oates, 1971, p. 1), and with notions that workaholics tend to allocate as much time as possible to work (e.g. Machlowitz, 1980). The second feature of their conceptualization is that workaholics persistently and frequently think about work when they are not at work. Workaholism is a “. . . reluctance to disengage from work that is

evidenced by the tendency to [. . .] think about work in any circumstances” (McMillan et al., 2001, p. 89), suggesting that workaholics are to some degree obsessed with their work (Oates, 1971). The third element in Scott et al.’s (1997) definition is that workaholics work beyond what is reasonably expected to meet organizational or economic requirements. This is a specification of the first feature, in that it deals with the motivation for spending an excessive amount of time on work. Workaholics work harder than is required out of an inner compulsion, and not because of external factors.

Correlates of workaholism

Scott et al.’s (1997) conceptualization suggests that workaholism is an all-encompassing phenomenon that has implications for both the work and the nonwork domain. Consistent with this idea, previous research has examined workaholism in the context of both domains.

Workaholism and the Nonwork Domain. If workaholism is a phenomenon that leads people to spend excessively much time on their work at the cost of other activities, workaholics should differ from others regarding the quantity and quality of the relationships they maintain with intimate others as well as the degree to which they feel that the work and nonwork domain interfere with each other. Consistent with these notions, levels of marital estrangement are higher among workaholics than among non-workaholics (Robinson, Flowers, & Carroll, 2001), while workaholics experience more work–life conflict than others (Bonebright, Clay, & Ankenmann, 2000). According to Robinson and Post (1997), workaholics perceive their current families as having less effective problem-solving ability, worse communication, and fewer affective responses than non-workaholics. It comes as no surprise, then, that children of workaholic fathers have greater depression and anxiety compared to children of non-workaholic fathers (Robinson & Kelley, 1998). Although these results support the idea that workaholism has a negative impact upon family functioning, Burke (2000a) found in a study among male and female managers that workaholics did *not* differ from non-workaholics in terms of their marital status. Thus, whereas workaholism seems to have a negative impact upon workaholics’ functioning in the non-work domain, there is no evidence that this leads to higher divorce rates.

Workaholism at Work. Previous research has shown that workaholics spend more time on their work than others (McMillan, Brady, O’Driscoll, & Marsh, 2002; Scott et al., 1997). Workaholics may even create more work for themselves by making simple projects more complicated than necessary, or by causing crises for the fun of working on the problems resulting from these (Machlowitz, 1980). This suggests that workaholics work longer and

harder than others not because their jobs require them to do so, but because they tend to create high job demands for themselves.

Research is inconclusive regarding the outcomes of the hard work of workaholics. Whereas some authors maintain that workaholics are extremely productive and a valuable asset to any organization (Machlowitz, 1980; Peiperl & Jones, 2001), others depict workaholics as tragic figures who do not perform well and who create difficulties for their coworkers (Oates, 1971; Porter, 2001). A study by Burke (2001b) revealed no evidence that workaholics perform especially well, in that there was no relationship between salary increases and career satisfaction on the one hand and workaholic behaviors on the other hand. Thus, it appears that workaholics might be working harder than others without receiving more “rewards” for their efforts. This is contingent with the idea that workaholics are motivated by a strong inner drive rather than by external motivators.

Workaholism and Health. Another type of outcome concerns the health effects of workaholism. Research on the effects of overtime has shown that there is a negative association between overtime and health; people who work a great deal of overtime are more likely to report high levels of stress, strain, and ill-health (Sparks, Cooper, Fried, & Shirom, 1997, for a review), presumably because hard workers have insufficient opportunity to recover from their excessive effort. Consistent with these findings, workaholics report relatively high levels of job stress (Burke, 2000b; Kanai et al., 1996) and health complaints (McMillan et al., 2001; Spence & Robbins, 1992).

Workaholism, Type-A Behavior and Commitment. There has been some discussion in the past whether workaholism can theoretically and empirically be distinguished from other concepts, most notably Type-A behavior (McMillan et al., 2001, 2003). As Robinson (1999) shows, these concepts resemble each other strongly; hostility and anger are prominent among Type-A persons as well as among work addicts, as are health risks, time urgency, perfectionism, and truncated interpersonal skills. Despite these similarities, empirical research revealed only modest correlations between workaholism components and Type-A behavior (Robinson, 1999; McMillan et al., 2001, for a review), suggesting that Type A behavior and workaholism are empirically distinct concepts.

Other concepts that are linked to workaholism are job involvement and commitment. Conceptually, job involvement is an important part of workaholism, in that workaholism is often defined and measured in terms of excessive commitment to work. However, if workaholism is just an extreme form of commitment to work there is no need to examine workaholism in its own right (Scott et al., 1997). Although Scott et al. argue that job involvement, commitment and workaholism are distinct phenomena, the

line between these concepts is sometimes thin. For example, Peiperl and Jones (2001) define workaholics as people who work hard (i.e. who invest much in their work) while perceiving the rewards arising from their work as being in balance with these investments. This equity-based definition of workaholics strongly resembles that of Siegrist's (1996) overcommitted workers. In Siegrist's view, being overcommitted results in a distorted perception of own investments and rewards, such that over-investing workers perceive their investments and rewards as equal while they in fact invest much more than they receive in return. It may well be the case that Peiperl and Jones' (2001) workaholics would be classified as overcommitted workers using the Siegrist (1996) framework.

STUDY 1: DEVELOPMENT AND VALIDATION OF THE DUTCH VERSION OF THE WART

In a long-running research program, Bryan Robinson and his coworkers have developed and validated the US version of the WART. The items of the WART were drawn from a list of symptoms reported by clinicians who were involved in diagnosing workaholism as they worked with families and clients on work addiction (e.g. Oates, 1971). Studies on the validity and reliability of the WART revealed good psychometric properties (Robinson, 1999, for a review). Flowers and Robinson (2002) recently presented analyses of the factorial structure of the WART, showing that the WART covered 5 dimensions: (1) Compulsive tendencies (9 items, dealing with working hard and difficulties in relaxing after work); (2) Control (7 items, referring to annoyance when having to wait for something or someone or when things do not go one's way); (3) Impaired communication and self-absorption (5 items, dealing with putting more energy into one's work than into relationships with others); (4) Inability to delegate (1 item); and (5) Self-worth (2 items, concerned with the degree to which one is interested in the results of one's work rather than the work process itself). Table 1 presents the items of the WART, together with the factor to which they belong according to Flowers and Robinson (2002). Study 1 aims to validate this 5-factor structure for the Dutch version of the WART.

Method

Sample. Three samples were employed. Sample A included persons who responded to a call appearing in a newspaper that is distributed for free among train commuters. Employed persons who were interested in participating in a study on "work enjoyment" could contact the researchers. Those who did so ($N = 152$) received a structured questionnaire addressing work characteristics, workaholism, and health. The questionnaire could be returned

TABLE 1
Items of the Original WART and Standardized First- and Second-order Factor Loadings for Model 4

	<i>Factor loadings (Model 4)</i>	
	<i>1st-order loadings</i>	<i>2nd-order loadings</i>
<i>Compulsive tendencies (alpha = 0.90)^a</i>		
3. I seem to be in a hurry and racing against the clock.	0.76	0.96
5. I stay busy and keep many irons in the fire.	0.68	
6. I find myself doing two or three things at one time such as eating lunch and writing a memo, while talking on the phone.	0.72	
7. I overly commit myself by biting off more than I can chew.	0.77	
8. I feel guilty when I am not working on something.	0.76	
15. I find myself continuing to work after my coworkers have called it quits.	0.56	
18. I put myself under pressure with self-imposed deadlines when I work.	0.80	
19. It is hard for me to relax when I am not working.	0.30	
20. I spend more time working than on socializing with friends, on hobbies, or on leisure activities.	0.62	
<i>Control (alpha = 0.82)</i>		
2. I get impatient when I have to wait for someone else or when something takes too long, such as long, slow-moving lines.	0.74	0.95
4. I get irritated when I am interrupted while I am in the middle of something.	0.45	
11. Things do not seem to move fast enough or get done fast enough for me.	0.75	
12. I lose my temper when things don't go my way or work out to suit me.	0.72	
16. I get angry when people don't meet my standards of perfection.	0.56	
17. I get upset when I am in situations where I cannot be in control.	0.65	
22. I get upset with myself for making even the smallest mistake.	0.50	
<i>Impaired communication/Self-absorption (alpha = 0.62)</i>		
13. I ask the same question over again, without realizing it, after I've already been given the answer once.	0.55	0.88
21. I dive into projects to get a head start before all phases have been finalized.	0.65	
23. I put more thought, time, and energy into my work than I do into my relationships with friends and loved ones.	0.73	
24. I forget, ignore, or minimize birthdays, reunions, anniversaries, or holidays.	0.48	
25. I make important decisions before I have all the facts and have a chance to think them through thoroughly.	0.43	

TABLE 1
Continued

	Factor loadings (Model 4)	
	1st-order loadings	2nd-order loadings
<i>Inability to delegate</i>		
1. I prefer to do most things myself rather than ask for help.	0.59	0.85
<i>Self-worth</i> (alpha = 0.56)		
9. It is important that I see the concrete results of what I do.	0.65	0.87
10. I am more interested in the final result of my work than in the process.	0.60	
<i>Not used</i>		
14. I spend a lot of time mentally planning and thinking about future events while tuning out the here and now.	–	–

NB. p of all factor loadings < 0.001. Item numbers in first column correspond with Flowers and Robinson (2002). Overall alpha (excluding item 14) = 0.93; including item 14 alpha = 0.94.

^a Subscale reliability is 0.89 without item 19.

to the researchers in a pre-stamped and pre-addressed envelope. After three weeks, 130 questionnaires had been returned (85.6% response; 47.2% male; $M_{\text{age}} = 47.8$, $SD = 7.5$). The participants differed widely regarding their occupation, while the average level of education was high; 65.0 percent of the participants held at least a college degree. The participants had a contract for on average 34.6 hours per week ($SD = 6.2$); 5.1 percent worked less than the number of hours specified in their contract, whereas 63.6 percent of the sample worked more. Indeed, 35 percent of the sample worked for at least 7 hours a week more than specified in their contract.

Sample B consisted of 124 employees who participated in a quality-of-work survey among the white-collar personnel of two heavy-industry organizations and a nuclear power plant (response rate was 47.8%; 85% male; M_{age} was 45.5, $SD = 9.0$). A third (34.1%) of the participants held a college or university degree; 40.4 percent had attended higher vocational training. The participants worked for on average 37.8 hours per week ($SD = 5.6$), which is close to the Dutch standard full-time working week of 38 hours. No information about overtime was available.

Sample C was recruited from the files of a Dutch outpatient clinic specializing in psychotherapeutic treatment of severe work-related mental health problems. All participants had been diagnosed with burnout by an MD and a psychologist, based on the criteria for neurasthenia of the *International*

Classification of Diseases (ICD-10), supplemented with the requirement that the symptoms should be work related. All participants had resumed work after successfully completing a standardized burnout treatment program. On average they had completed this program 12.4 months ago ($SD = 6.4$). Information was collected for two time points (T1 and T2, respectively). At T2 the participants received a written structured questionnaire addressing mental health, work, and workaholism. After 6 weeks, 102 clients (36.2%) had returned a completed questionnaire ($M_{\text{age}} = 41.8$, $SD = 10.2$; 47% male; 35.0% held a college or university degree, 41.2% had completed higher vocational training).

Preliminary comparison of the variance-covariance matrixes for the 25 items of the WART did not reveal major differences among the three samples. Thus, samples A–C were pooled, yielding a total sample of 356 participants.

Questionnaire Development. The items of Robinson's (1999) 25-item WART were translated into Dutch by the first author and then back-translated by a lay person who was unaware of the subject of the questionnaire. They discussed differences in translation until agreement was reached. This version of the WART was completed by all participants in samples A–C.

Statistical Analysis. The factor structure of the WART was examined using confirmatory factor analysis (Jöreskog & Sörbom, 1993). Four competing models that could reasonably be expected to account for the relations among the items were specified and fitted to the data (MacCallum, Roznowski, & Necowitz, 1992). The fit of these models was compared, and the best-fitting model was accepted as the model that best approximated the latent structure that generated the data.

The first model (M1) assumed that a single latent dimension accounted for the associations among the items of the WART, with all items loading on this dimension. This model corresponds with the idea that workaholism as measured with the WART is a unidimensional phenomenon. The second model (M2) distinguished among 5 latent factors, corresponding with the factors distinguished by Flowers and Robinson (2002). To test whether these factors are orthogonal, M2 assumed that these latent factors were uncorrelated, implying that workaholism is a multi-faceted phenomenon, while these facets are basically independent from each other. The third model (M3) resembled M2 strongly, in that this model distinguishes among 5 latent factors corresponding with the dimensions distinguished by Flowers and Robinson (2002). However, M3 assumed that these factors were correlated with each other. Thus, like M2, this model construed workaholism as a multi-dimensional phenomenon; however, in M3 these dimensions are related. Finally, the fourth model (M4) distinguished among 5 uncorrelated first-order factors (cf., M2). The associations among these factors were

TABLE 2
 Comparison of the Fit of Several Factor Models for the Relations among the Items
 of the WART ($N = 356$, excluding item 14)

	<i>Model description</i>	<i>chi-square</i>	<i>df</i>	<i>NNFI</i>	<i>AGFI</i>	<i>CFI</i>	<i>RMR</i>
M1	1-factor model	1327.0	252	0.98	0.97	0.98	0.07
M2	5-factor model, factors uncorrelated	9475.9	252	0.27	0.39	0.34	0.30
M3	5-factor model, factors correlated	1264.6	242	0.98	0.97	0.98	0.07
M4	5 first-order factors plus 1 second-order factor	1284.4	247	0.98	0.97	0.98	0.07

accounted for by a single second-order factor on which the 5 first-order factors were assumed to load. Thus, M4 construes workaholism as a multi-dimensional construct; at a higher level these first-order dimensions load on a single second-order dimension. M4 corresponds closely with Flowers and Robinson's (2002) stance that the WART consists of 5 dimensions that measure distinct aspects of workaholism.

Results

Table 2 shows that the uncorrelated 5-factor model (M2) did not fit the data well. The fit of the other models was acceptable; all NNFI, AGFI and CFI's .97 or better, all RMRs equal to .07. The fit of these models differed only with regard to their chi-square values. Although the fit of the 1-factor model M1 was quite acceptable (chi-square (252, $N = 356$) is 1327.0), the two 5-factor models resulted in considerably lower chi-square values (Δ_{M1-M3} is 276.9 with 10 df , $p < .001$; Δ_{M1-M4} is 273.4 with 5 df , $p < .001$). M3 and M4 fitted the data about equally well; as M4 had more degrees of freedom, it was accepted as the best model.

Table 1 presents the first- and second-order factor loadings of the 24 items of the WART for M4 (note that item 14 was not included in the analysis because this item did not load on any of the dimensions in Flowers and Robinson's (2002) analysis). As Table 2 reveals, all items show healthy loadings on their respective factors, with the notable exception of item 19 which fails to reach the .40 threshold used by Flowers and Robinson (2002). Inspection of the second-order loadings reveals that all dimensions load highly on the second-order factor, with Compulsive Tendencies, Control and Impaired communication/Self-absorption being somewhat more important than the other two dimensions. These results mesh well with Flowers and Robinson's (2002) finding that the items of the Compulsive tendencies, Control and Impaired communication/Self-absorption scales in particular discriminated well between workaholics and others.

The reliability of the full 25 (24)-item scale is good, $\alpha = .94$ (.93), exceeding reliabilities reported for the original US version of the WART. The reliability of Compulsive Tendencies and Control is acceptable as well (alphas are .90 and .82, respectively); the reliability of the other subscales is much lower (alpha is .62 for Impaired communication/Self-absorption and .56 for Self-worth). Thus, it appears that Compulsive Tendencies and Control may be assessed in their own right; the other subscales are too unreliable to be used separately.

Discussion

Our results strongly resemble the findings reported by Flowers and Robinson (2002). The Dutch version of the WART consists of 5 correlated dimensions, with a second-order factor accounting for the associations among these dimensions. Thus, workaholism as measured by the WART manifests itself in a number of empirically distinct, but interrelated domains. The reliability of the total scale is good; 2 subscales (Compulsive tendencies and Control) are reliable as well.

It is interesting to compare the subscales of the WART to the core elements in Scott et al.'s (1997) definition of workaholism. These were that (1) workaholics spend much time to work at the cost of other activities; (2) workaholics are more or less obsessed with their work; and (3) workaholics work beyond what can reasonably be expected from them. At least 3 of the subscales of the WART (Control; Inability to delegate; and Self-worth) tap dimensions that are *not* mentioned by Scott et al. (1997) as core features of workaholism. The fourth subscale, Impaired communication/Self-absorption, includes items referring to working hard at the cost of other activities (item 23 and 24) and may thus be presumed to measure a key aspect of workaholism. The fifth subscale, Compulsive tendencies, not only includes items referring to working hard, but also an item referring to working hard at the cost of other activities (item 20). Furthermore, one of the items of this subscale refers to working harder than one's colleagues (item 15), suggesting that workers with high scores on this subscale work harder than others feel is necessary. Thus, this subscale covers two of the three core dimensions of workaholism mentioned by Scott et al. (1997). This line of reasoning thus suggests that from a conceptual point of view it is not necessary to use the full WART to obtain a theoretically sound measure of workaholism; the Compulsive tendencies subscale may be sufficient. Study 2 deals more fully with this issue.

STUDY 2: TOWARDS A SHORT MEASURE OF WORKAHOLISM

Study 1 addressed the internal validity of the 25-item WART and its Compulsive Tendencies (CT) subscale. Study 2 focuses on the external validity

of the WART by computing correlations among the full WART and its CT subscale on the one hand, and theoretically related concepts (such as job demands, overtime, work–nonwork conflict, and health complaints) on the other. Inspection of the patterns of correlations provides an indication of (a) the external validity of the WART and the CT subscale, and (b) the degree to which the full WART and the CT subscale retain similar patterns of relationships with other concepts. If these relationships are similar, there is no need to include the full WART in research on workaholism.

The correlates included in Study 2 were drawn from both the work and the family domain. Predictions regarding the associations between workaholism and these correlates are based on the literature review presented in the introduction. Generally speaking, workaholics should obtain relatively high scores on measures of job-related effort (working overtime and perceived job demands), work-related strain (work–nonwork conflict and job burnout), and mental health complaints). Finally, associations with background variables (age, gender, relationship status) are examined.

Method

Sample. The samples included in this study are sample A (a convenience sample of 130 train commuters) and sample C (102 former burnout clients) employed in Study 1, where both samples were described in some detail. These samples will be analyzed separately as their nature is quite different; pooling them may result in biased correlation coefficients. Further, both samples partly include different correlates of workaholism.

Measures. *Workaholism* was measured using the full 25-item version of Robinson's (1999) WART as well as an 8-item Compulsive Tendencies scale (item 19 was omitted owing to a low factor loading for the overall sample employed in Study 1). The reliability of the 25-item scale was .89 for Sample A and .93 for Sample C; the reliability of the 8-item scale was lower, but still quite acceptable (.84 and .87, respectively).

Both samples employed in Study 2 included measures of job-related effort (i.e. overtime and job demands), job strain (i.e. work–nonwork conflict and burnout), and mental health. *Overtime* was measured by subtracting the number of hours one was required to work according to one's contract from the number of hours that one on average worked. *Perceived job demands* were measured using the 4-item scale developed by Karasek (1985), including items such as "My job requires that I work very fast", 1 = "never", 4 = "always" (alpha = .84 in Sample A and .85 in Sample C). *Work–nonwork conflict* was measured using 3 items of the Survey Work-Home Interference Scale employed by Van der Hulst and Geurts (2001). A typical item of this scale is "How often does it occur to you that you are irritable at home

because your work is demanding?" (0 = "never", 3 = "always", alpha = .63, sample A only).

Burnout was measured using the Maslach Burnout Inventory—General Survey (MBI–GS; Schaufeli, Leiter, Maslach, & Jackson, 1996). The MBI–GS consists of three scales. Five items tap *Exhaustion* (e.g. "I feel used up at the end of the work day", 0 = "never", 6 = "every day", alpha was .86 in sample A and .92 in sample C). *Cynicism* (a negative, cynical and callous orientation towards one's job) is measured by four items (e.g. "I doubt the significance of my job", response categories are the same as for Exhaustion, alphas were .83 and .87 for sample A and C, respectively). Six items represent the *Professional efficacy* dimension (a subjective judgment regarding one's own functioning at the job, e.g. "In my opinion, I do a good job", alphas were .80 and .77 for sample A and C). High scores on exhaustion and cynicism and low scores on professional efficacy are indicative of burnout. *Mental health* was measured using the Symptom Checklist-90 (Derogatis, Rickets, & Rock, 1976), tapping whether the participants suffered from complaints such as having headaches and feeling desperate about the future (alpha = .97, sample C only). Further, the participants indicated whether they had been *treated* by their MD or a psychologist for *work-related stress complaints* in the 5 years preceding the study (Sample A only).

Finally, workaholism was examined as a function of biographical background variables such as *Age*, *Gender* and *Relationship status* (married/unmarried cohabitation vs. other).

Results

Simple correlation coefficients were computed to examine the degree to which the full 25-item version of the WART and its 8-item CT subscale overlapped. For Sample A, a correlation of .89, $p < .001$, was found (i.e. both versions share 79.2% of their variance); for Sample C, this correlation was .93 ($p < .001$, 86.5% shared variance). Note that these correlations underestimate the strength of the association between both concepts as they are not corrected for unreliability; after correction, these correlations equal or exceed 1.00. Thus, the full WART and its CT subscale appear to measure the same concept. The question, then, is whether this finding is corroborated by the patterns of correlations that the full WART and the CT subscale retain with other concepts.

Table 3 shows that the variation in the patterns of correlations between workaholism and other concepts across samples is considerable, perhaps due to their specific nature. However, *within* each sample the pattern of correlations is very similar for the full WART and its CT subscale. The difference between both sets of correlation coefficients varies from .00 to .15 (median difference is .06), meaning that the differences between the results

TABLE 3
Correlates of the Short and Long Version of the WART in Two Samples

<i>Variables</i>	<i>Sample A (N = 130)</i>		<i>Sample C (N = 102)</i>	
	<i>25-item version</i>	<i>8-item version</i>	<i>25-item version</i>	<i>8-item version</i>
<i>Biographical background</i>				
Gender (0 = male, 1 = female)	-0.10	0.05	-0.00	-0.03
Age	-0.18*	-0.12	-0.12	-0.12
Relational status (0 = married/ cohabiting, 1 = other)	0.09	-0.01	-0.04	0.02
<i>Job stress</i>				
Job demands	0.19*	0.33***	0.48***	0.54***
Overtime	0.36***	0.39***	0.13	0.20
<i>Job strain</i>				
Work-nonwork conflict	0.64***	0.66**	not measured	
Exhaustion	0.43***	0.45***	0.57***	0.55***
Cynicism	0.06	0.16*	0.30**	0.20*
Professional efficacy	-0.08	-0.04	-0.01	-0.08
<i>Mental health</i>				
SCL-90	not measured	0.67***	0.61***	
Treated for stress-related complaints? (0 = no, 1 = yes)	0.17	0.20**	^a	
Scale reliability (Cronbach's alpha)	0.89	0.84	0.93	0.87
r_{25} item version - 8-item version	0.89***	0.93***		

* = $p < 0.05$, ** = $p < 0.01$, *** = $p < 0.001$.

^a All participants in this sample had been treated for burnout.

obtained for the full WART and the CT subscale are generally negligible. Interestingly, the full WART is *not* consistently more strongly related to other concepts than the CT subscale, as might be expected on the basis of the higher reliability of the full WART. Thus, the concepts underlying the 25-item WART and its CT subscale seem very similar indeed.

Table 3 shows that high scores on workaholism are associated with high perceived job demands in both samples, although the correlations are somewhat stronger in sample C (.48 and .54) than in sample A (.19 and .33). In addition, in both samples there are positive correlations between workaholism and overtime (albeit not significant in sample C). Further, workaholics report higher levels of work-nonwork conflict than non-workaholics (correlations of .64 and .66 for the full WART and the CT subscale, Sample A only). These findings support the idea that workaholics score high on concepts representing job-related effort, while spending much time on work may foster conflicts in the nonwork domain.

The results reported in Table 3 strongly support earlier findings that workaholics experience more stress and strain than others. The correlations between workaholism and exhaustion range from .43 to .57; for cynicism, correlations ranging from .06 (*ns*) to .30 ($p < .01$) are found; workaholics obtain high scores on the SCL-90 (correlations were .67 and .61, Sample C only); whereas there is some evidence that workaholics were somewhat more often treated for stress-related complaints over the last 5 years.

Finally, the associations between workaholism and gender, age and relational status were examined. We found no convincing evidence that gender or relational status was associated with workaholism; the correlations between age and workaholism were consistently negative (older participants reported lower levels of workaholism), but significant in only one out of four cases.

Discussion

Study 2 examined the overlap between the full WART and its CT subscale in two samples. The correlation between both scales was substantial in both samples (.89 and .93), suggesting that little information is lost by focusing on the CT subscale only. Further, comparison of the pattern of correlations between the two measures of workaholism and other concepts revealed that these were remarkably similar for both measures. Irrespective of the measure used, workaholics tended to invest much time and effort in their work at the cost of nonwork activities, while they also reported high levels of burnout and mental health complaints. Interestingly, all correlations between workaholism and professional efficacy were non-significant, indicating that workaholism does not impair the employee's perceived competence. Following Peiperl and Jones (2001), it can be speculated that putting much effort in one's job—at least partly—leads to the desired outcomes so that the employee's sense of competence remains intact. These results strongly suggest it is not necessary to employ the full WART to measure workaholism; the CT subscale provides a good indication of the degree to which participants suffer from workaholism.

One shortcoming of Study 2 is that the results were based on two small samples. As these samples were not pooled, the power of this study was low; only large correlations will be significant. Thus, the evidence on the correlates of workaholism is not definitive (although it should be noted that our results largely replicated previous findings). Another shortcoming is that the evidence presented was based exclusively on bivariate associations (as, it must be said, is the rule rather than the exception in workaholism research, McMillan et al., 2001). Although this approach provides good insight into the correlates of workaholism, little understanding is gained of the *process* that links workaholism to its presumed "effects": more comprehensive models that specify *how* workaholism affects particular outcome variables

are needed. Study 3 deals with both limitations by examining the consequences of workaholism using a process model for the effects of workaholism on job-related effort and job strain.

STUDY 3: THE EFFECTS OF WORKAHOLISM ON JOB STRAIN

The research discussed in the introduction demonstrated that workaholism is associated with high levels of job stress and work–nonwork conflict. Furthermore, it has been suggested that workaholism might lead to burnout because working excessively depletes one’s mental resources, resulting in a state of mental exhaustion known as burnout (Maslach, 1986). While it seems plausible that workaholism affects job stress and work–nonwork conflict through the excessive amount of time and energy devoted to work activities, and burnout through the depletion of mental resources, as yet this reasoning has not been tested empirically. Therefore, a study was conducted that tests the model presented in Figure 1.

The model presented in Figure 1 can be considered a set of theory-based hypotheses on the effects of workaholism on other, related concepts. As Figure 1 shows, the association between workaholism and job strain (i.e. exhaustion—the core element of burnout—and work–nonwork conflict) is assumed to be mediated by the amount of work-related effort, measured in terms of overtime and perceived job demands. In order to examine whether the effect of workaholism on the strain variables is *fully* mediated by these intermediary variables, this “full mediation model” (including only the solid arrows in Figure 1) is compared to a “partial mediation” model that includes direct effects of workaholism on the strain variables as well (i.e., the dotted arrows in Figure 1). Further, the effects of several background variables (gender, age, salary and tenure) are controlled. As these are not of substantive interest in the present study, no hypotheses concerning their effects are formulated.

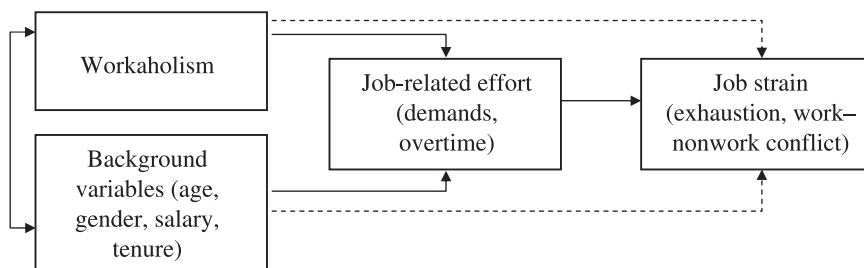


FIGURE 1. Conceptual model for the effects of workaholism and background variables on job stress and job strain.

Method

Sample. The sample consisted of higher staff of the head office of a large Dutch retail organization. All females and half of the males in the 6 highest salary scales of the organization (starting at about €45,000 a year) received a structured questionnaire addressing work characteristics, subjective well-being, and workaholism. After three weeks 199 completed questionnaires had been returned, yielding a response rate of 48.5% (58.8% male; M_{age} 39.6 years, $SD = 8.3$; 90.4% held at least a college degree; average number of years employed by the organization was 10.4 years, $SD = 8.8$; 96.5% of the sample supervised on average 6.3 others, $SD = 24.4$).

Measures. *Workaholism* was measured using the 8-item CT scale of Robinson's (1999) WART (item 19 was omitted as the loading of this item did not reach the .35 threshold in Study 1). The reliability of this scale (alpha) was .78. *Overtime* was measured by subtracting the number of hours one was required to work according to one's contract from the number of hours that one on average worked. *Perceived job demands* were measured using the 4-item scale employed in Study 2 (alpha = .84). *Exhaustion* was measured using the 5-item scale employed in Study 2 (alpha = .83). *Work–nonwork conflict* was measured using the full 6-item scale employed by Van der Hulst and Geurts (2001); Study 2 employed a 3-item version of the same instrument (alpha = .85). Finally, *Age*, *Gender* and *Salary level* (a 6-level proxy of job complexity/job status) were included as background variables. Table 4 presents descriptive information for the variables in Study 3.

Procedure. Structural equation modeling (Jöreskog & Sörbom, 1993) was used to compare the fit of various models. The model presented in Figure 1 was extended with effects of age, gender and salary level on all dependent variables. In order to examine whether workaholism affected job strain (i.e. exhaustion and work–nonwork conflict) directly or indirectly (i.e. via job-related effort), two versions of the model were tested. The first model (M1) linked workaholism to exhaustion and work–nonwork conflict via perceived job demands and overtime. No direct effects of workaholism on exhaustion/work–nonwork conflict were included. This model was compared with a model (M2) that was identical to M1, except that it included direct effects of workaholism on exhaustion and work–nonwork conflict (i.e. the dotted arrows in Figure 1).

Results

Model 1 did not fit the data very well, chi-square (2, $N = 199$) was 51.67, NNFI = .68, CFI = .91, AGFI = .16, RMR = .06. As Model 2 had no degrees

TABLE 4
Correlations, Means and Standard Deviations for the Variables in Study 3 ($N = 199$)

<i>Variables</i>	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) Exhaustion	1.00								
(2) Work–nonwork conflict	0.61	1.00							
(3) Perceived job demands	0.37	0.54	1.00						
(4) Overtime	0.05	0.32	0.35	1.00					
(5) Workaholism	0.44	0.65	0.59	0.38	1.00				
(6) Age	–0.08	0.03	–0.03	0.04	–0.12	1.00			
(7) Gender (0 = male, 1 = female)	–0.01	–0.02	0.00	–0.16	0.07	–0.40	1.00		
(8) Tenure	–0.12	–0.03	–0.05	–0.08	–0.17	0.68	–0.34	1.00	
(9) Salary	–0.06	0.22	0.14	0.33	0.15	0.30	–0.13	0.05	1.00
<i>M</i>	1.38	1.90	2.61	8.18	2.45	39.64	1.38	10.21	2.77
<i>SD</i>	1.07	0.49	0.56	5.69	0.51	8.44	0.49	8.66	1.49

NB. Correlations of 0.14 or better are significant at $p < 0.05$.

of freedom no model test was possible, chi-square (0, $N = 199$) = 0.00. The difference in fit between M1 and M2 was statistically significant, delta chi-square (2, $N = 199$) was 51.67, $p < .001$. Thus, M2 (including direct effects of workaholism on exhaustion and work–nonwork conflict) was accepted as the best model. However, inspection of the separate parameter estimates revealed that several path coefficients were not significant. These were subsequently omitted. The fit of the resulting revised model did not deteriorate significantly, chi-square (14, $N = 199$) = 17.30, $p > .05$, NNFI = .98, CFI = .99, AGFI = .94, RMR = .03.

Figure 2 presents the standardized parameter estimates for the revised version of M2 (i.e. the model including only statistically significant parameter estimates). Workaholism strongly affected both exhaustion and work–nonwork conflict. Participants reporting much work–nonwork conflict experienced high job demands (an effect of .22, $p < .001$) and were likely to report high levels of workaholism (an effect of .51, $p < .001$). As workaholism affected perceived job demands as well (an effect of .60, $p < .001$), workaholism affected work–nonwork conflict both directly and indirectly. The amount of variance explained in work–nonwork conflict was quite satisfactory (48%).

Similar findings were obtained for exhaustion. Elevated levels of exhaustion were reported by participants experiencing high job demands (an effect of .17, $p < .01$), suggesting that workaholism affected exhaustion indirectly. Further, workaholism affected exhaustion directly (an effect of .37, $p < .001$).

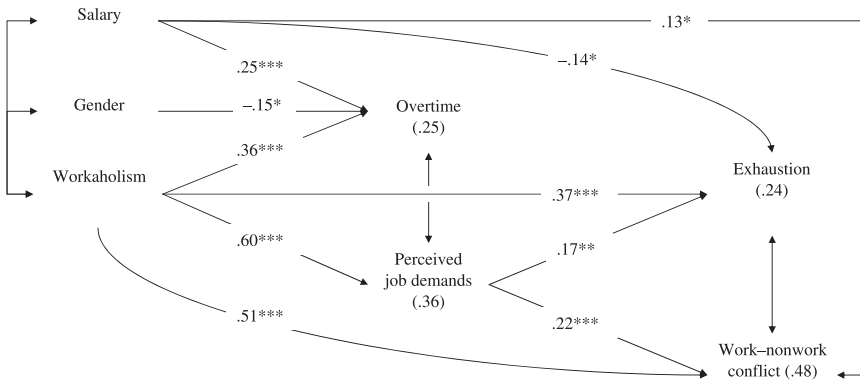


FIGURE 2. Standardized parameter estimates for the final model (significant effects only, R-squares in brackets, $N = 199$).
 * = $p < .05$, ** = $p < .01$, *** = $p < .001$.

These effects were in line with our expectations. This did not apply, however, to the effects of overtime on exhaustion. Although workaholics reported more overtime than non-workaholics (an effect of .36, $p < .001$), no effect of overtime on exhaustion was found. Again, the total amount of variance explained in exhaustion was satisfactory (24%).

Some of the background variables were also significantly associated with exhaustion and/or work–nonwork conflict. Participants in high salary brackets were more likely to report high levels of overtime (an effect of .25, $p < .001$), low levels of exhaustion (an effect of $-.14$, $p < .05$) and high levels of work–nonwork conflict (.13, $p < .05$) compared to others. Further, men reported more overtime than women (a standardized effect of $-.15$, $p < .05$).

Discussion

Study 3 extended and enhanced earlier research on the effects of workaholism on exhaustion and work–nonwork conflict by testing a preliminary model for the process relating work addiction to work outcomes. We proposed that workaholism would affect work–nonwork conflict and exhaustion indirectly, via job demands and overtime, because spending more time on one’s work implies that less time and energy are available for nonwork activities and recovery, respectively. While this reasoning is implicit in most studies examining the effects of workaholism on work–nonwork conflict and job strain, ours is the first study to subject this reasoning to an empirical test. Further, we examined to which degree the effects of workaholism on the outcome variables were mediated by job stress.

Our results indicated that the effects of workaholism on work–nonwork conflict and exhaustion were only partly mediated through job demands. Thus, whereas workaholics tend to experience high job demands, this is not the only mechanism that links workaholism to the strain variables in this study. Whereas it seems plausible that workaholic behaviors result in exhaustion, even if one's job is not overly demanding, the strong direct effect on work–nonwork conflict requires more explanation. It might be assumed that this is partly due to an artifact, namely that the CT subscale includes items that refer to work interfering with other activities (e.g. item 20 in Table 1). Although this is consistent with definitions of workaholism in terms of spending much time on work activities at the cost of other activities (Scott et al., 1997), this overlap might have caused a spuriously high correlation with work–nonwork conflict. However, the correlation between CT and work–nonwork conflict remained high after omitting his particular item from the CT scale (.61 instead of .65), suggesting that the strong association between these concepts cannot be construed as a statistical artifact.

Whereas we found that workaholics reported higher levels of overtime compared to non-workaholics, it was interesting to note that there were no effects of overwork on either exhaustion or work–nonwork conflict. Thus, as regards the strain variables included in this study, it appears largely irrelevant whether people work overtime or not: as Burke (1999) concisely summarized, it is not how hard you work (i.e. the number of hours one works) but how you work hard (i.e. how one perceives one's job demands).

Perhaps the most important limitation of Study 3 is the fact that a cross-sectional design was used. It is well known that such designs cannot provide conclusive evidence regarding the causal direction of effects, meaning that the model tested in this study should be regarded as a tentative proposal regarding the causal order of the concepts included in this model. Further testing, preferably using longitudinal data, is necessary before any firm conclusions on the effects of workaholism on other variables can be drawn. Be that as it may, we believe that Study 3 provides interesting insights into the possible effects of workaholism on other concepts. But perhaps more important is that the pattern of effects of workaholism on the other variables included in this study is consistent with the findings reported in Study 2 as well as those of earlier studies (cf., our literature review in the introduction). Thus, Study 3 underscores the validity of the CT scale as a measure of workaholism.

OVERALL DISCUSSION

The present research was designed in an attempt to validate the Dutch version of Robinson's (1999) Work Addiction Risk Test (WART). Three related studies were presented, each of which addressed a different aspect of

this validation process. The findings of the first study showed that the 25-item Dutch version of the WART is a reliable instrument. Moreover, the pattern of results of this study strongly resembled the factor structure reported by Flowers and Robinson (2002) for the original US version of the WART. The second study showed that the association between the 25-item WART and its 8-item Compulsive Tendencies (CT) subscale was high, whereas both scales retained highly similar relationships with other concepts. Thus, it appears that the CT subscale is as good a measure of workaholism as the full WART. Study 3 further examined the validity of the CT subscale as a measure of workaholism in a cross-sectional study of exhaustion and work–nonwork conflict among higher employees, showing that workaholism affects these strain variables both directly and indirectly (through job demands). The associations reported in Study 3 were consistent with those of earlier findings, again showing that the CT subscale is a valid measure of workaholism.

Study Limitations. Although the evidence presented in our three studies seems compelling, it should be noted that each of these has its limitations. The samples used in these studies were small (Study 2) or heterogeneous (Sample A in Study 1), whereas all samples were cross-sectional. Small sample size implies that results may be biased by outliers; uncontrolled heterogeneity may be responsible for spurious effects. The fact that the results converged across studies and that they were in line with results reported elsewhere suggests that the bias caused by such mechanisms was not large. Furthermore, the cross-sectional nature of the sample implies that it is impossible to draw conclusions on the causal direction of effects. Thus, replication of our results using a large longitudinal sample is desirable.

Another limitation of the present research is that only one measure of workaholism was used. Other measures of workaholism exist, and the degree to which the WART and these other measures converge is as yet unknown. Most notable in this respect is Spence and Robbins's (1992) Workaholism Battery. Their conceptualization of workaholism diverges considerably from that of Robinson (1999). Based on their notion of a "workaholic triad" that includes work involvement, drivenness and work enjoyment, Spence and Robbins identify 3 types of workaholics: *true workaholics*, scoring high on involvement and drive and low on enjoyment; *work enthusiasts*, scoring high on enjoyment and involvement and low on drive; and *enthusiastic workaholics*, scoring high on all three components. In contrast, neither the WART nor its Compulsive Tendencies subscale distinguishes between workaholics who enjoy their work and those who do not. Although this distinction is not a standard element in the definition of workaholism (Scott et al., 1997), it may be worthwhile to examine the differences among various types of workaholics.

Directions for Future Research. In spite of these shortcomings, we believe that the results presented here are promising enough to suggest that further research on the effects of workaholism will enhance our understanding in the causes of work-related stress and strain. For example, our results suggested that workaholism might play a crucial role in explaining the relationship between work characteristics, job-related effort, stress and strain. If workaholism is indeed a stable individual-difference variable (which is in itself an assumption that must be examined further), it would seem possible that job-related illness is largely a matter of personality rather than the result of an excessively high work load. Although as yet this reasoning is mere speculation, it is obvious that the concept of workaholism triggers new research questions, thus opening up new and interesting avenues in research on job stress and strain. To consummate this potential, follow-up research should go beyond the discussions of the “right” conceptualization of workaholism and the examinations of the correlates of workaholism that are currently published. Rather, we encourage the development and testing of process models that specify how workaholism influences (and is influenced by) other concepts. Study 3 presents a first step in this direction; we hope that other researchers interested in workaholism and related concepts will consider this study a challenge, rather than the last word on the effects of workaholism.

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