

## A LONGITUDINAL STUDY OF THE RELATIONSHIP BETWEEN THE FIVE-FACTOR MODEL OF PERSONALITY AND WORKAHOLISM

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The present study comprised 1267 nurses who took part in the 2012, 2013, and 2014 waves of the longitudinal study “Survey of Shiftwork, Sleep and Health.” Besides answering questions about work schedules in all waves, the nurses completed the Bergen Work Addiction Scale (BWAS), assessing workaholism, both in the 2012 and the 2014 waves. In the 2012 wave, personality was measured by the Mini-International Personality Item Pool (Mini-IPIP). Intraclass correlation analysis showed a high stability of workaholism across the 24-month follow-up period, although a small but significant increase over time was found. A hierarchical regression analysis was conducted in order to identify factors that could explain change in workaholism across the follow-up period. The results showed that Neuroticism was positively associated with an increase in workaholism. Starting to have at least one child in the household during the same period was negatively associated with an increase in workaholism. Those categorized as stable non-workaholics had lower scores on Neuroticism compared to all other nurses. Stable workaholics had higher scores on Intellect/Imagination than stable non-workaholics.

**Key words:** Five-factor model of personality; Longitudinal; Nurses; Workaholism; Behavioral addiction.

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Workaholism is typically described as a chronic pattern of high work investment, long working hours, working beyond organizational expectations, and an uncontrollable obsession with work (Griffiths, 2011; Ng, Sorensen, & Feldman, 2007). Today, workaholism is mainly perceived as a negative entity (Quinones & Griffiths, 2015). Accordingly, ample evidence links workaholism with a wide range of negative outcomes, such as impaired health (Shimazu, Schaufeli, Kamiyama, & Kawakami, 2015), low job and life satisfaction (Shimazu, Schaufeli, Kubota, & Kawakami, 2012), work-family conflicts (Hakanen & Peeters, 2015), impaired job performance (Shimazu & Schaufeli, 2009), as well as sickness absence (Falco et al., 2013). Due to methodological limitations, both related to operationalization and samples, prevalence estimates of workaholism seem uncertain. However, in a recent study based on a representative sample of Norwegian employees, a prevalence of 8.3% was reported (Andreassen, Griffiths, et al., 2014). Since workaholism has been consistently associated with negative outcomes and since the prevalence of workaholism seems to be of some magnitude, it is important, in terms of prevention and treatment, to identify its antecedents.

One line of research has, in this regard, focused on demographic and dispositional factors. In terms of demographic variables, studies have shown a quite consistent negative relationship between age and workaholism (Andreassen, Griffiths, et al., 2014; Andreassen, Hetland, & Pallesen, 2010; Taris, van Beek, & Schaufeli, 2012). Workaholism, seems however, to be unrelated to gender (Andreassen, Griffiths, et al., 2014; Andreassen et al., 2010; Burke, 1999; Taris et al., 2012). Previous studies have further shown that workaholism seems to be unrelated to childcare responsibility (Adkduman, Hatipoglu, & Yüksesbilgili, 2015; Andreassen, Griffiths, et al., 2014) as well as marital status (Andreassen, Griffiths, et al., 2014; Clark, Michel, Zhdanova, Pui, & Baltes, in press).

Regarding dispositional factors, several studies have linked personality traits — such as narcissism (Clark, Lelchhook, & Taylor, 2010), perfectionism (Stroeber, Davis, & Townley, 2013), and type-A behavioral pattern (Robinson, 1996) — to workaholism. One of the most influential contemporary personality theories is however the five-factor model of personality. This model differentiates between five main personality dimensions: 1) Neuroticism (e.g., being nervous and anxiety prone), 2) Extroversion (e.g., being talkative and outgoing), 3) Openness to Experience (e.g., being imaginative and intellectually oriented), 4) Agreeableness (e.g., being sympathetic and warm), and 5) Conscientiousness (e.g., being organized and prompt) (Wiggins, 1996). According to evolutionary perspectives, the five dimensions are closely linked to solving adaptive problems related to the following fundamental questions about human nature: “Who will burden me with their problems and fail to cope well with adversity?” (Neuroticism); “Who will gain high status in the social hierarchy?” (Extroversion); “Who will be able to provide good advice?” (Openness); “Who will be a good cooperater and reciprocator?” (Agreeableness); “Who will work industriously and dependably?” (Conscientiousness) (Buss, 1991).

Several previous studies have investigated the relationship between workaholism and the five-factor model. Using the Workaholism Battery (WorkBAT; Spence & Robbins, 1992) for assessing workaholism, Burke, Matthiesen, and Pallesen (2006) found in a study of nursing home personnel that Extroversion was positively associated with the Work Involvement dimension of workaholism and that Neuroticism and Conscientiousness both were positively associated with the Drive dimension of workaholism. They also found that Openness was inversely associated with the Drive dimension of workaholism. In a study on working students assessing workaholism with the Work

Addiction Risk Test (WART; Robinson, 1999) the authors reported that Neuroticism was positively associated with workaholism (Clark et al., 2010). In a cross-occupational sample where the WorkBAT was administered, it was found that Neuroticism, Extroversion, and Conscientiousness were all positively associated with both Work Involvement and Drive, whereas Agreeableness was negatively associated with Work Involvement and Drive (Andreassen et al., 2010). In a later study of a cross-occupational sample assessing workaholism with the WorkBAT, it was found that Conscientiousness was positively associated with Work Involvement and that both Conscientiousness and Openness were positively associated with Drive (Aziz & Tronzo, 2011). When investigating the relationship between workaholism and the five-factor model in a national representative sample of employees using the Bergen Work Addiction Scale (BWAS; Andreassen, Griffiths, Hetland, & Pallesen, 2012) it was reported that Agreeableness, Neuroticism, and Openness were all positively associated with workaholism (Andreassen, Griffiths, et al., 2014). A recent meta-analysis concluded however that Extroversion was the only dimension of the five-factor model of personality that was significantly (positive) associated with workaholism (Clark et al., in press).

Overall, results from previous studies do not seem to present a clear and consistent picture of the relationship between workaholism and the five-factor model of personality. In addition, a major limitation of previous studies on the association between workaholism and the five-factor model of personality is the lack of longitudinal studies. This puts serious restrictions on identification of the directionality of relationships between study variables which is a pre-requirement for, for example, prevention. Against this backdrop, we investigated the relationship between changes in continuous workaholism scores over a two-year time period (2012 and 2014) and the five-factor model of personality in a sample of nurses, controlling for demographic variables such as age, gender, marital status, and childcare responsibilities. We also investigated whether changes in a dichotomized categorization of workaholism over the two-year time period were related to the five-factor model of personality.

## METHOD

### Design and Procedure

The present study comprised nurses who took part in three waves (over the course of two years) of the Survey of Shiftwork, Sleep, and Health (SUSSH), which is an ongoing longitudinal study with annual surveys among Norwegian nurses. The SUSSH was initiated in 2008 when 6000 nurses, all members of the Norwegian Nurses Organization, were invited to participate. The invited nurses were randomly selected from five different strata based on how long it was since they had completed their nursing education. Specifically, 1200 nurses from each of the following five strata were invited: 0-1.0 years since completion of degree, 1.1-3 years, 3.1-6 years, 6.1-9 years, and 9.1-12 years. Six hundred invitations were returned due to wrong addresses. A total of 2059 nurses responded, which amounts to a response rate of 38.1%. One year later (2009), 2741 newly graduated nurses were invited to participate, of which 905 agreed, yielding a response rate of 33.0%. These two groups together formed the baseline cohort of the SUSSH. The present study is based on data from the 2012, 2013, and 2014 surveys (also referred to as waves) of this cohort, which had re-

response rates (based on those who originally agreed to participate) of 75.1%, 69.2%, and 67.5%, respectively. Variables assessed in the 2012 wave comprised basic demographics (age, gender, marital status, and childcare responsibilities), work schedule, personality (five-factor traits), and workaholism. In the 2013 wave, work schedule status (change in work/workplace since the 2012 wave) was re-assessed. In the 2014 wave demographics (marital and childcare status), work schedule status, and workaholism were re-assessed. Hence, the 2012 wave was the only wave where all the present study variables were assessed simultaneously. The SUSSH study was approved by the Regional Committee for Medical and Health Research Ethics, Health Region West, Norway in 2008 (case number 088.08) and by the Norwegian Data Inspectorate.

### Participants

The sample ( $N = 1267$  nurses; 1142 females and 125 males) in the present study consisted of those who participated and who provided valid answers to the relevant questions/items in all three surveys: 2012, 2013, and 2014. The female preponderance in the current sample fits well with the overall female-male ratio among Norwegian nurses which is about 10:1 (Flo, 2013). The mean age of the sample in 2012 was 35.71 years ( $SD = 8.46$ ). Most of the nurses were married/partners/cohabitating in 2012 (76.4%) as well as in 2014 (77.9%). In 2012 a total of 57.1% of the sample reported that they had at least one child in their household, whereas the corresponding proportion in 2014 was 63.1%. In the 2013 and 2014 surveys, the nurses were asked whether they had changed work or work place during the last year, and a total of 53.5% reported to have changed work/workplace between 2012 and 2014.

### Instruments

*Bergen Work Addiction Scale* (BWAS). Workaholism was assessed (in the 2012 and 2014 waves) by the BWAS comprising seven items all reflecting general addiction criteria (i.e., salience, tolerance, mood modification, relapse, withdrawal, conflict, and problems) experienced during the past year (e.g., “How often during the last year have you become stressed if you have been prohibited from working?”). Each item is answered on a 5-point Likert scale ranging from 1 (*never*) to 5 (*always*). Higher scores reflect higher levels of workaholism. In addition, a cut-off score for the BWAS categorizes those who score higher than 3 on at least four items as workaholics. Hence, the BWAS provides both continuous scores and categorization of workaholism (Andreassen et al., 2012). Cronbach’s alpha of the BWAS in 2012 and 2014 was .84 and .83, respectively.

*Mini-International Personality Item Pool* (Mini-IPIP). Personality was assessed (in the 2012 wave) by the Mini-IPIP (Donnellan, Oswald, Baird, & Lucas, 2006), which comprises 20 items and is based on the five-factor model of personality (Wiggins, 1996). Four items reflect each of the personality traits: Extroversion (e.g., “Am the life of the party”), Agreeableness (e.g., “Sympathize with others’ feelings”), Conscientiousness (e.g., “Get chores done right away”), Neuroticism (e.g., “Have frequent mood swings”), and Intellect/Imagination (e.g., “Have a vivid imagination”), the latter being equal to the Openness dimension (Wiggins, 1996). All items are an-

swered on a 5-point scale ranging from 1 (*very inaccurate*) to 5 (*very accurate*). Cronbach's alphas for the five aforementioned subscales in the present study were .78, .67, .66, .73, and .67, respectively.

### Statistical Analyses

Statistical analyses were performed in SPSS, version 23.0. Univariate descriptive analyses of each study variable were conducted and results were calculated in terms of means and standard deviations or as percentages. In order to investigate the stability/change in workaholism from 2012 to the 2014 an intraclass correlation coefficient based on model ICC 2, 2 (two-way random, absolute agreement, average measures) was calculated (Shrout & Fleiss, 1979). Also a paired *t*-test was used in order to investigate whether the mean score on the BWAS had changed significantly from 2012 to 2014. A McNemar test was conducted in order to investigate whether the proportion of nurses categorized as workaholics differed between 2012 and 2014. In addition, bivariate correlation coefficients between all study variables were calculated. Finally, a hierarchical linear regression analysis was conducted where the workaholism score in 2014 comprised the dependent variable. In the first step, the workaholism score in 2012 was entered. In the second step, basic demographic variables in terms of gender, age, marital status, having at least one child in the household, and change of work (no/yes) between 2012 and 2014 were entered. Marital status was dummy coded (so that being in a relationship both in 2012 and 2014 comprised the reference category). Also, having at least one child in the household was dummy coded (so that having at least one child in the household both in 2012 and 2014 comprised the reference category). In the third and final step of the analysis, the composite score on the five personality dimensions was entered. Preliminary analyses were conducted to ensure no violation of the assumption of normality, linearity, multicollinearity, and homoscedasticity. In terms of the workaholics categorization, we investigated how many of the nurses belonged to the following four categories: non-workaholic both in 2012 and 2014, workaholic in 2012/non-workaholic in 2014, non-workaholic in 2012/workaholic in 2014, and workaholic both in 2012 and 2014, respectively. Analyses of variance (ANOVA), with Bonferroni correction, were then conducted in order to compare these four groups on the five personality dimensions. ANOVA is especially sensitive to deviations from non-normality in terms of platykurtosis (Stevens, 2002), however all tests for the presence of platykurtosis were not significant.

### RESULTS

Table 1 shows descriptive statistics of all study variables. The vast majority (73.2%) was living with a partner both in 2012 and in 2014. The majority (55.0%) also had at least one child in their household in both 2012 and 2014, whereas 34.7% was living without children in the household at both time points. The intraclass correlation coefficient (ICC 2, 2) between the score on the BWAS in 2012 and 2014 was .72 ( $p < .01$ ). The *t*-test for dependent samples showed that the mean score of BWAS significantly increased from 2012 to 2014 (13.01 vs. 13.97;  $t = 7.78$ ,  $df = 1266$ ,  $p < .01$ ) with a small (Cohen's *d*) effect size of 0.22 (Cohen, 1988). In Table 2 the corre-

lation coefficients (Pearson product moment correlation, point-biserial correlation or Phi coefficients) between all study variables are shown. They varied between  $-.81$  (having at least one child in the household in 2012 and 2014 and not having children in the household in 2012 and 2014) and  $.57$  (the BWAS score in 2012 and the BWAS score in 2014). A hierarchical regression analysis was used to assess if the workaholism score in 2012, demographic variables, change in work/workplace, and the personality dimensions of the five-factor model of personality could predict the workaholism score in 2014 (see Table 3). The workaholism score in 2012 was entered in Step 1, explaining 33.0% of the variance in the workaholism score in 2014,  $\Delta F(1, 1265) = 622.88, p < .01$ . The demographic variables and change of work/workplace entered in Step 2 explained an additional 0.8% of the variance in the workaholism score in 2014,  $\Delta F(9, 1256) = 1.64, p > .05$ . The personality variables entered in Step 3 explained additionally 1.9% of the variance in the workaholism score in 2014,  $\Delta F(5, 1251) = 7.37, p < .01$ . The final model explained a total of 35.7% of the variance in the workaholism score in 2014,  $F(15, 1251) = 46.23, p < .01$ .

TABLE 1  
 Descriptive statistics in terms of percentages (%) or mean (*M*) and standard deviation (*SD*)  
 of the study variables (*N* = 1267)

Variable	%	<i>M</i> ( <i>SD</i> )
<i>Gender</i>		
Women	90.1	
Men	9.9	
<i>Age in 2012</i>		35.71 (8.46)
<i>Marital status</i>		
Living with partner in 2012 and 2014	73.2	
Living alone in 2012 and 2014	18.9	
Living with partner in 2012 but alone in 2014	3.2	
Living alone in 2012 but with partner in 2014	4.7	
<i>Child in household</i>		
At least one child in household both in 2012 and 2014	55.0	
No child in household in 2012 and 2014	34.7	
At least one child in household in 2012 but none in 2014	2.1	
No child in household in 2012 but at least one in 2014	8.1	
<i>Changed work/workplace during the last two years</i>		
Not changed	46.5	
Changed	53.5	
<i>Mini-IPIP (five-factor model of personality)</i>		
Extroversion		14.10 (3.20)
Agreeableness		17.67 (2.02)
Conscientiousness		16.78 (2.55)
Neuroticism		11.02 (3.42)
Intellect/Imagination		13.33 (2.92)
<i>Bergen Work Addiction Scale</i>		
2012		13.01 (4.74)
2014		13.97 (4.78)



TABLE 2  
Bivariate correlation coefficients between all study variables ( $N = 1267$ )

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. Gender (1 = ♂, 2 = ♀)																	
2. Age	-.03																
3. With partner in 2012 and 2014	.00	.06*															
4. Without partner in 2012 and 2014	.04	-.02	-.80**														
5. With partner in 2012, without in 2014	-.05	.01	-.30**	-.09**													
6. Without partner in 2012, with in 2014	-.04	-.09**	-.37**	-.11**	-.04												
7. With children in 2012 and 2014	.06*	.09**	.37**	-.32**	-.02	-.17**											
8. Without children in 2012 and 2014	-.02	-.04	-.44**	.42**	.01	.13**	-.81**										
9. With children in 2012, without in 2014	-.01	.18**	-.02	-.02	.13**	-.03	-.16**	-.11**									
10. Without children in 2012, with in 2014	-.08**	-.19**	.10**	-.14**	-.05	.10**	-.33**	-.22**	-.04								
11. Work/workplace change (1 = no, 2 = yes)	-.00	-.12**	-.01	-.03	.03	.06*	-.01	.01	-.05	.03							
12. Extroversion	.07*	-.04	-.05	.03	.00	.05	-.03	.03	.01	-.02	.02						
13. Agreeableness	.24**	.02	.04	-.03	.01	-.04	-.01	-.00	.03	.00	-.03	.29**					
14. Conscientiousness	.14**	.06	-.00	.02	-.03	-.02	.02	-.03	.04	-.00	-.07*	.14**	.20**				
15. Neuroticism	.08**	-.09**	-.02	.01	.03	-.00	.02	.02	-.08**	-.03	.07**	-.16**	-.08**	-.24**			
16. Intellect/Imagination	-.13**	.04	-.06	.04	.00	.03	-.08**	.07*	.03	.02	.05	.22**	.17**	-.03	.00		
17. Bergen Work Addiction Scale 2012	-.06*	-.04	-.14**	.10**	.07**	.04	-.11**	.11**	.02	.01	.07*	.03	-.01	-.12**	.30**	.08**	
18. Bergen Work Addiction Scale 2014	-.01	-.03	-.12**	.09**	.06*	.03	-.04	.08**	.01	-.07*	.06*	.03	-.02	-.12**	.30**	.06	.57**

\*  $p < .05$ . \*\*  $p < .01$ .

TABLE 3  
Regression analysis summary for workaholism score in 2012, demographics, work change,  
and personality variables predicting workaholism score in 2014 ( $N = 1267$ )

Predictor	<i>B</i>	<i>SE</i>	$\beta$	<i>t</i>	$\Delta R^2$
<i>Step 1</i>					.330**
Bergen Work Addiction Scale 2012	0.580	0.023	.574	24.96**	
<i>Step 2</i>					.008
Bergen Work Addiction Scale 2012	0.576	0.024	.570	24.43**	
Gender (1 = ♂, 2 = ♀)	0.251	0.372	.016	0.68	
Age	-0.008	0.014	-.015	-0.61	
<sup>a</sup> Without partner in 2012 and 2014	0.323	0.318	.026	1.02	
<sup>a</sup> With partner in 2012, without in 2014	0.451	0.642	.016	0.70	
<sup>a</sup> Without partner in 2012, with in 2014	0.485	0.542	.021	0.90	
<sup>b</sup> Without children in 2012 and 2014	-0.118	0.268	-.012	-0.44	
<sup>b</sup> With children in 2012, without in 2014	0.073	0.787	.002	0.09	
<sup>b</sup> Without children in 2012, with in 2014	-1.364	0.426	-.078	-3.20**	
Work/workplace change (1 = no, 2 = yes)	0.211	0.223	.022	0.95	
<i>Step 3</i>					.019**
Bergen Work Addiction Scale 2012	0.529	0.025	.524	21.57**	
Gender (1 = ♂, 2 = ♀)	0.104	0.390	.006	0.27	
Age	-0.001	0.014	-.002	-0.09	
<sup>a</sup> Without partner in 2012 and 2014	0.358	0.315	.029	1.14	
<sup>a</sup> With partner in 2012, without in 2014	0.402	0.635	.015	0.63	
<sup>a</sup> Without partner in 2012, with in 2014	0.494	0.536	.022	0.92	
<sup>b</sup> Without children in 2012 and 2014	-0.099	0.265	-.010	-0.37	
<sup>b</sup> With children in 2012, without in 2014	0.432	0.780	.013	0.55	
<sup>b</sup> Without children in 2012, with in 2014	-1.229	0.422	-.070	-2.91**	
Work/workplace change (1 = no, 2 = yes)	0.134	0.221	.014	0.61	
Extroversion	0.055	0.037	.037	1.49	
Agreeableness	-0.034	0.059	-.014	-0.57	
Conscientiousness	-0.036	0.045	-.019	-0.80	
Neuroticism	0.197	0.035	.141	5.61**	
Intellect/Imagination	0.010	0.039	.006	0.25	

Note. *B* = unstandardized regression coefficient, *SE* = unstandardized standard error,  $\beta$  = standardized regression coefficient, *t* = *t*-test value,  $\Delta R^2$  = change in  $R^2$  between steps, <sup>a</sup>living with partner in 2012 and 2014 comprises the reference category, <sup>b</sup>having at least one child in household in 2012 and 2014 comprises the reference category.

\*\*  $p < .01$ .

Significant predictors in the final step were the workaholism score in 2012 ( $\beta = .524, p < .01$ ), not having children in the household in 2012 but having at least one child in the household in 2014 ( $\beta = -.070, p < .01$ ), and Neuroticism ( $\beta = .141, p < .01$ ). In terms of categorization of the nurses into non-workaholics and workaholics, in all 4.0% were workaholics in 2012 compared to 4.3% in 2014. This change was not significant ( $p > .05$ , McNemar's test). In all, 1181 nurses were non-workaholics both in 2012 and 2014 (stable non-workaholics), 32 nurses were workaholics in 2012 and non-workaholics in 2014, 35 nurses were non-workaholics in 2012 and workaholics in 2014, and 19 nurses were workaholics both in 2012 and 2014 (stable workaholics). Comparisons between these groups on the five personality traits are shown in Table 4. Those who were non-workaholics in 2012 and 2014 had lower scores on Neuroticism compared to the three other

groups and lower scores on Intellect/Imagination compared to those who were workaholics both in 2012 and 2014.

TABLE 4  
Means (*M*) and standard deviations (*SD*) of the four groups of workaholics

Personality dimension	Group 1	Group 2	Group 3	Group 4	Variance analysis <i>F</i> (3, 1263)
	Non-workaholic 2012/2014	Workaholic 2012, non-workaholic 2014	Non-workaholic 2012, workaholic 2014	Workaholic 2012/2014	
	( <i>n</i> = 1181)	( <i>n</i> = 32)	( <i>n</i> = 35)	( <i>n</i> = 19)	
	<i>M</i> ( <i>SD</i> )	<i>M</i> ( <i>SD</i> )	<i>M</i> ( <i>SD</i> )	<i>M</i> ( <i>SD</i> )	
Extroversion	14.05 (3.23)	14.91 (2.41)	14.09 (2.69)	15.53 (3.19)	<i>F</i> = 2.65, † <i>p</i> > .05
Agreeableness	17.67 (2.02)	17.19 (2.44)	17.89 (1.64)	18.05 (1.99)	<i>F</i> = 0.97, <i>p</i> > .05
Conscientiousness	16.81 (2.55)	16.63 (2.11)	16.34 (2.66)	15.95 (2.84)	<i>F</i> = 1.10, <i>p</i> > .05
Neuroticism	10.84 (3.37) <sup>2,3,4</sup>	12.88 (2.88) <sup>1</sup>	13.03 (3.37) <sup>1</sup>	15.31 (2.87) <sup>1</sup>	<i>F</i> = 19.04, <i>p</i> < .01
Intellect/ Imagination	13.29 (2.92) <sup>4</sup>	13.28 (3.03)	13.57 (2.65)	15.26 (2.94) <sup>1</sup>	<i>F</i> = 2.94, <i>p</i> < .05

Note. † Brown-Forsythe corrected. The numbers in superscripts show which groups differ from each other.

## DISCUSSION

The findings showed a high stability of workaholism over time, although a small and significant increase in the mean workaholism score from 2012 to 2014 was found. A regression analysis showed that this increase was positively related to the Neuroticism score in 2012 and inversely related to starting to have at least one child in the household in the period between 2012 and 2014. Those who were stable non-workaholics scored lower on Neuroticism compared to all other workaholism groups. The stable non-workaholics also scored lower than the stable workaholics on Intellect/Imagination.

We start this discussion by commenting on the stability and change in workaholism over time. The intraclass correlation coefficient between the workaholism measures 24 months apart was .72 which suggests a relatively high stability over time, both in terms of mean value and consistency. The results are in line with a previous study showing high test-retest reliability between different workaholism measures administered 24-30 months apart (Andreassen, Hetland, & Pallesen, 2014). The high intraclass correlation reported here is comparable to stability coefficients for a wide range of personality scales for the same test-retest interval (Costa & McCrae, 1994). This suggests that workaholism seems to be a relative stable entity and it has accordingly been regarded as a personality trait by some (McMillan, O'Driscoll, & Burke, 2003).

Still, some change in workaholism was noted. A significant increase in the continuous workaholism score over the 24-month period was found, albeit with a small effect size. This finding is at odds with studies showing an inverse relationship between age and workaholism (Andreassen, Griffiths, et al., 2014; Andreassen et al., 2010; Taris et al., 2012). The results from previous cross-sectional studies and the findings from the present study are thus indicative of a cohort effect concerning workaholism. This cohort effect might reflect a higher societal emphasis on work (Reiss, 2002), which assumingly will impact the most recent generations most. Another explanation is that workaholism develops as the nurses gain experience and mastery as well as get more responsibility at work (Machlowitz, 1980). It should still be noted that no significant change in the proportion of nurses categorized as workaholics was found during the two-year follow-up period. Only longitudinal studies with long time span and preferably with more than two waves can elucidate how workaholism develops with time.

In terms of how the five-factor model of personality was related to the change in the continuous workaholism scores over a two-year period, the results showed that the only dimension related to this change was Neuroticism. Specifically, Neuroticism was positively related to a subsequent increase in workaholism. This finding is in line with the findings of some previous cross-sectional studies on the relationship between the five-factor model of personality and workaholism (Andreassen, Griffiths, et al., 2014; Andreassen et al., 2010; Burke et al., 2006; Clark et al., 2010), but at odds with others (Aziz & Tronzo, 2011) including a recent meta-analysis on the topic (Clark et al., in press). The discrepancy between findings across studies may result from several factors. In this regard, it should be noted that the present study is the first, to our knowledge, to investigate how the five-factor model relates to changes in workaholism over time, whereas previous studies on this topic have all relied on cross-sectional designs (Andreassen, Griffiths, et al., 2014; Andreassen et al., 2010; Aziz & Tronzo, 2011; Burke et al., 2006; Clark et al., 2010). Another factor relates to the different measures of workaholism that have been employed across studies. The instrument used in the present study (Andreassen et al., 2012) is the only workaholism measure that is conceptually aligned with the core criteria for addiction (Quinones & Griffiths, 2015). This may have influenced how its scores relate to the dimensions of the five-factor model of personality.

Regarding more theoretically oriented explanations for the relationship between Neuroticism and subsequent increases in workaholism, it should be noted that workaholism has been associated with a wide range of psychiatric symptoms (Andreassen, Griffiths, Shinha, Hetland, & Pallesen, 2016), a finding that underlines the more recent pathological view on workaholism. As workaholism has been consistently linked with several negative outcomes and psychopathology (Quinones & Griffiths, 2015), this may also explain the link between workaholism and Neuroticism. Moreover, studies on several other behavioral addictions, such as video game addiction (Braun, Stopfer, Muller, Beutel, & Egloff, 2016), Internet addiction (Wu, Lee, Liao, & Chang, 2015), shopping addiction (Otero-López & Pol, 2013), and pathological gambling (Miller et al., 2013), have shown these to be related to Neuroticism. These findings and the finding from the present study can be understood in line with the escape hypothesis, whereby people are assumed to become excessively involved with certain behaviors in order to refocus on less aversive states (Richards, 1999). Regarding categorization of workaholism, we did find that those who were stable non-workaholics had lower scores on Neuroticism than all the other groups. Hence, those who stopped being workaholics, those who became workaholics, and those who were stable workahol-

ics had higher scores on Neuroticism than the stable non-workaholics. This may suggest that also previous workaholics are characterized by a specific vulnerability. We also found that those who were stable workaholics scored higher on Intellect/Imagination than those who were stable non-workaholics. One explanation to why workaholism is related to Intellect/Imagination may be that people with high scores on this trait are likely to be intelligent and curious and, thus, more involved in work (Andreassen, Griffiths, et al., 2014).

Regarding the demographic variables, we found that the change in workaholism over time was unrelated to gender. This is in accordance with most previous studies (Andreassen, Griffiths, et al., 2014; Andreassen et al., 2010; Burke, 1999; Taris et al., 2012). Although, as discussed above, workaholism increased over time, it was still unrelated to age in the regression analysis, which suggests that the increase in workaholism over time was unrelated to age at baseline. Change in workaholism was further unrelated to marital status. This is in line with most cross-sectional studies (Andreassen, Griffiths, et al., 2014; Clark et al., in press). In the last step of the regression analysis it was shown that starting to have at least one child in the household in the follow-up period was inversely related to the increase in workaholism over time, compared to the contrast group who had at least one child in the household at both assessment points. This finding runs counter to previous cross-sectional studies reporting that workaholism is unrelated to childcare responsibility (Adkduman et al., 2015; Andreassen, Griffiths, et al., 2014). Cross-sectional studies are however precluded from identifying factors related to changes in workaholism. The current finding, thus, most likely reflects a reorientation toward family values when becoming a parent. This is in line with studies showing that men with an egalitarian perspective on fatherhood and women in general tend to work less when becoming parents (Kaufman & Uhlenberg, 2000).

### Strengths and Limitations

Some limitations of the present study deserve mention. The study sample had a large female preponderance, which limits the external validity in terms of gender. The relatively low response rate in the first wave of SUSSH should also be noted as a limitation. As all participants were nurses, the results cannot be generalized to other working populations without reservations. However, the fact that all were nurses also puts limits on the influence of several work specific confounders regarding the results. The demographic and personality variables explained only a small percentage of the variance in change of workaholism over time, which arguably may limit the practical implications of the findings. The relatively small amount of explained variance in Step 2 and Step 3 of the regression analysis may be due to the restricted range of scores on the BWAS. In this regard it should be noted that the prevalence of workaholism among the nurses was about half of what was found in a Norwegian representative sample of workers (Andreassen, Griffiths, et al., 2014). Restricted range of scores was also found on some dimensions of the five-factor model of personality (e.g., Agreeableness and Conscientiousness). When comparing the different workaholism groups it should be noted that the sample sizes vary, which makes the statistical power for the different comparisons unequal. The high temporal stability of workaholism also puts some limits on the ability to identify factors related to change in this variable.

In terms of strengths, the longitudinal design of the present study allowed us to investigate predictors of change in workaholism over time. As such, this represents a major advancement compared to previous studies investigating the relationship between personality and workaholism. The sample size was large and provided sufficient statistical power to the analyses. Another asset of the present study is the use of well-validated instruments. The fact that the BWAS, as one of very few workaholism measures, provides the opportunity for categorization of respondents into non-workaholics and workaholics, allowed for a comparison of the mean personality score of groups based on their change/stability of workaholism category.

### CONCLUSIONS

The workaholism score was quite consistent in this sample of nurses over the 24-month follow-up period, although a small but significant increase was registered. The increase in workaholism over time was positively related to Neuroticism and inversely related to starting to have at least one child in the household in the follow-up period. Stable non-workaholics had lower scores on Neuroticism compared to the other workaholism categories, whereas stable workaholics had higher scores on Intellect/Imagination than stable non-workaholics.

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