

## **Workaholism Components and Occupational Safety among Norwegian Oil Rig Workers**

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# Workaholism Components and Occupational Safety among Norwegian Oil Rig Workers

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## Abstract:

*Purpose* -This research examined the relationship of workaholism components identified by Spence and Robbins (1992) and perceptions of risk at work, occupational health and safety values and practices, accidents and "near miss" accidents at work. Three workaholism components were considered: work involvement, feeling driven to work because of inner pressures, and work enjoyment.

*Design/methodology/approach* -Data were collected from 1017 Norwegian workers on oil rigs in the North Sea using questionnaires, a 59% response rate.

*Findings* - Oil rig workers scoring higher on feeling driven to work indicated higher levels of perceived risk, rated the safety climate less favorably and reported more "near miss" accidents. Oil rig workers scoring higher on work enjoyment reported lower risk perceptions and a more favorable occupation safety and health climate. Finally, oil rig workers scoring higher on work involvement indicated less positive perceptions of health and safety values and practices but fewer "near miss" accidents at work.

*Research limitations/implications* -All data were collected using worker self-reports at one point in time making an examination of causality difficult.

*Practical implications* - These findings are consistent with recent evidence highlighting the role of individual factors in predicting accidents at work.

*Originality/value*- Extends our understanding of workplace accidents by incorporating new stable individual characteristics.

**Keywords:** Workaholism components, safety climate, risks, accidents

Employee accidents at work represent a large financial cost to individuals, organizations and society at large. It has been estimated that accidents alone cost the American economy, \$156 billion in 2003 in direct and indirect costs. Those figures do not include the pain and suffering experienced by injured workers and their families. Some accidents obviously result in the deaths of accident victims (National Safety Council, 2004). In the UK, 39 million working days were lost in 2003-2004, 30 million due to work-related ill health and 9 million due to workplace injury at a cost to employers of 4-8 billion pounds per year (Health and Safety Executive, 2004a, 2004b, cited in Clarke & Robertson, 2007).

The research on accidents in the workplace has examined both individual and workplace characteristics (Clarke & Robertson, 2005; Mearns, Flin, Gordon & Fleming, 2001; Mearns, Rundmo, Flin, Gordon & Fleming, 2004; Neal, Griffin, & Hart, 2000). Individuals with particular characteristics are more likely to experience accidents or near misses; in addition, workplaces (or occupations) having particular characteristics are more likely to have accidents (Zohar & Luria, 2005). Much of the recent writing on workplace accidents has focused on organizational and environmental factors even though human factors are involved in 80% to 90% of workplace accidents (Guldenmund, 2000; Hale & Glendon, 1987; Clarke & Robertson, 2007).

For example, Gauchard, Mur, Tauron, Benamghar, Dehoene, Perrin and Chau (2006) studied 2610 French railway workers and found that 27% of the sample had more frequent than usual accidents with injuries. Younger workers, workers with less job experience, workers scoring higher on job dissatisfaction, those having no safety training, and those reporting poor sleep patterns, who smoked, and who got little exercise had more injuries.

The early writing on accidents, as far back as the early 1900s (Greenwood & Woods, 1919), noted that some individuals were involved

in a disproportionate number of accidents, termed "accident prone" individuals (Haddon, Suchman & Klein, 1964; Shaw & Sichel, 1971). Later research failed to consistently identify characteristics of "accident prone" individuals so interest in these individual difference factors waned. More recently, however, accident research has returned to studies of personal characteristics in understand accident and near misses (Dunn, 2002).

There has been a resurgence of interest in the role of personality factors in explaining work place accidents (Selgado, 1998; Chen, 2006; Jin, Araki, Wu, Zhang & Yokoyama, 1991; Marusic, Musek & Gudjonsson, 2001). It has been observed that some individuals are involved in a disproportionate number of accidents. Trying to identify characteristics of such individuals opens possibilities for selection, training job placement and individual counseling.

It has been shown that most personality dimensions can be subsumed within Big Five personality factors (Digman, 1990; Goldberg, 1992; Barrick, Mount & Judge, 2001). These factors are conscientiousness, agreeableness, openness, extraversion and neuroticism. These personality factors have been found to have relationships with a variety of individual behaviors in the workplace as well as with job performance (Barrick & Mount, 1991; Barrick, Mount & Judge, 2001; Mount, Barrick & Stewart, 1998; Salgado, 1998; Judge, Martocchio & Thoresen, 1997). There have also been examinations of the role of the Big Five in predicting workplace accidents but since fewer studies have included accidents as criterion variables, there is perhaps less consensus on the role played by the Big Five here. Thus Clarke and Robertson (2005; 2007), using meta-analysis, found that low agreeableness was a valid predictor of involvement in work accidents (Clarke & Robertson, 2007), and low conscientiousness and low agreeableness to be valid predictors of accident involvement. Selgado (2002) reported that none of the Big Five personality

factors were found to be predictors of accidents. It was noted that the context of the various studies acted as a moderator the personality-accident relationship. Thus in occupational settings, low agreeableness and high neuroticism were associated with accidents, while in non-occupational settings (e.g., traffic accidents), extraversion, low conscientiousness and low agreeableness were significant predictors. Loo (1979) found that extraversion and neuroticism were associated with frequency of driving accidents. Jin, Araki, Wu, Zhang and Yokoyama (1991) reported that accident-prone drivers, individuals having 3 or more accidents between 1980-1984, compared to drivers having no accidents during this period, scored higher on both neuroticism and extraversion. And Sumer (2003) found that all Big Five factors had indirect effects on accident risk through their effects on aberrant driving behaviors.

Sutherland and Cooper, in a series of studies (Sutherland & Cooper, 1986; 1991; Cooper & Sutherland, 1987) of workers on oil rigs in the North Sea, reported that Type A coronary prone behavior and neuroticism were both associated with increased accident involvement, job dissatisfaction, poorer mental health and higher levels of work and home stress.

Ely and Meyerson (2006), in a study of men working on oil platforms in the Gulf of Mexico, found that men's tendency to behave in masculine ways to impress male co-workers lead to accidents. Studies in coal mining have reported that men who act infallible to impress their co-workers also had more accidents. Ely and Meyerson (2006) observed that men who made themselves vulnerable performed their jobs more safely and productively.

Venkataraman (2002) observed a relationship of managers' scores on the Big Five and organizational injuries and accidents of their units, using objective accident and injury data provided by the organization.

The present study was carried out among

men and women in Norway working on oil rigs in the North Sea. There is considerable evidence that working on oil rigs is highly demanding and stressful (Cooper & Sutherland, 1987; Parkes, 1998; Ross, 1978; Rundmo, 1992a, 1992b; Sutherland & Cooper, 1989a, 1989 b; Sutherland & Cooper, 1996; Sutherland & Flin, 1989; Ulleberg & Rundmo, 1997). Stressors include adverse physical environment, rough seas, platform movement, the construction of the platform, the risk of travel by helicopter and ship, exposure to noise and accident hazards, heavy physical demands, monotony, living in a cramped space, and being away from one's family and community. In addition to affecting the worker's health, the health and well-being of family members can also be affected. Some research (Aiken & McCance, 1982) has raised concerns about the life-style behaviors of oil rig workers (e.g., smoking, alcohol consumption) and their emotional health (e.g., depression).

There has been considerable research attention devoted to the experience of working on oil rigs that has examined accidents (Mearns, Flin, Fleming & Gordon, 1998; Rundmo, 2000; Rundmo, Hestad & Ulleberg, 1998), job demands, stressors and strains (Chen, Wong, Yu, Lin & Cooper, 2003; Wong, Chen, Yu, Lin & Cooper, 2002), risk perceptions (Finn, Mearns, Gleming & Gordon, 1996; Fleming, Flin, Mearns & Gordon, 1998; Mearns & Flin, 1995; Rundmo, 1996; Rundmo & Sjoberg, 1998; Sjoberg, 1998; van Vuuren, 2000), risk management (O'Dea & Flin, 2001; Rundmo, 1994), safety climate (Cox & Cheyne, 2000; Flin, Mearns, O'Connor & Bryden, 2000; Glencon & Stanton, 2000; Mearns, Whitaker & Flin, 2001), and effects on the family and separation from the family and one's community (Clark, McCann, Morrice & Taylor, 1985; Collinson, 1998; Mikkelsen, Ringstad & Steineke, 2004; Morrice, Taylor, Clark & McCann, 1985; Parkes, Carnell & Farmer, 2005).

It should be noted that although this rese-



arch emphasizes individual characteristics, a more complete understanding of accidents and workplace injuries also must include social and organizational factors, what Reason terms "organizational accidents" (Reason, 1997). This involves a consideration of the safety climate and safety culture within workplaces-the policies, procedures and practices relevant to safety in the workplace.

The present study examines the relationships of particular workaholism components and work experiences, risk perceptions, safety practices and observed accidents and near-misses. These personal characteristics represent stable individual difference factors (McMillan, O'Driscoll, Brady & Marsh, 2001 ; Robinson, 1998; Scott, Moore & Miceli, 1997).

Spence and Robbins (1992), based on an extensive review of the workaholism literature, identified and developed measures of three workaholism components; work involvement, feeling driven to work because of internal pressures, and work enjoyment. Workaholics were hypothesized to experience more stress at work, to have more problematic relationships with colleagues, to have more negative work attitudes and be in poorer psychological health (see Burke, 2000; 2007; McMillan, O'Driscoll & Burke, 2003, for general reviews of the workaholism writing and research literature).

Focusing more specifically on the Spence and Robbins workaholism components, feeling driven to work has been shown to be related to lower levels of psychological well-being and higher levels of stress (Burke, 1999, 2000; Spence & Robbins, 1992; Buelens & Poelmans, 2004). Galperin and Burke (2006), in a study directly relevant to the present research, considered the relationship of the three Spence and Robbins' workaholism components and measures of both constructive deviance (e.g., developed creative solutions to problems, best to break the rules to better perform the job) and destructive deviance (e.g., making fun of someone, taking property from work without

permission). They found that the three workaholism components were differentially related to the workplace deviance measures. Employees scoring higher on work involvement were less likely to engage in destructive deviant acts toward the organization; feeling driven to work was positively correlated with interpersonal destructive deviance and less likely to engage in innovative constructive deviance: and work enjoyment was positively associated with constructive behaviors that helped the organization.

This exploratory study extends workaholism research in considering the relationship of the three workaholism components to include perceptions of safety risks, safety climate, accidents and near-misses. These three types of outcomes have been commonly considered in previous research on workers on oil rigs (Parkes, 1993). Workaholism components have not been considered as predictors of these work outcomes to our knowledge.

The following general hypotheses were considered:

**Hypothesis 1.** Respondents scoring higher on work involvement would perceive fewer safety risks, report a more favorable safety climate and fewer accidents and near misses.

**Hypothesis 2.** Respondents scoring higher on feeling driven to work would perceive more safety risks, a less favorable safety climate and more accidents and near misses.

**Hypothesis 3.** Respondents scoring higher on work enjoyment would perceive fewer safety risks, report a more favorable safety climate and fewer accidents and near misses.

## Method

### Procedure

Data were collected from oil rig workers in mid-2005 using a questionnaire. Questionnaires were distributed by mail to 1800 randomly selected offshore workers representing various companies and installations. All were members of either NOPEF (Norsk Olje-og Petrokjemisk Fagforbund) or

OFS (Oljearbeidernes Fellessammenslutning) – later renamed SAFE (Sammenslutningen Av Fagorganiserte: Energisektoren), the major unions for offshore workers in Norway. A total of 1017 individuals returned complete questionnaires to the research team in pre-stamped envelopes that were provided, a 59% response rate. Ethics approval was obtained from the University of Bergen before proceeding.

### *Measures*

Some of the measures used were developed in Norway; others were translated from English to Norwegian using the back translation method.

#### *Personal demographic*

These were measured by single items and included age and gender.

#### *Work situation characteristics*

These were also measured by single items and included job function, offshore and platform tenure, organizational level and employer (see Table 1 for a complete listing of these).

#### *Workaholism Components*

Three workaholism components proposed by Spence and Robbins (1992) were measured by scales they developed.

Work involvement was measured by seven items ( $\alpha = .56$ ). One item was “I like to use my time constructively, both on and off the job”.

Feeling driven to work was assessed by an eight item scale ( $\alpha = .82$ ). An item was “I seem to have an inner compulsion to work hard, a feeling that it’s something I have to do whether I want to or not”.

Work enjoyment was measured by seven items ( $\alpha = .81$ ). One item was “Most of the time my work is very pleasurable”. Respondents indicated their agreement on a five point scale (1 = Strongly disagree, 3 = Neither agree nor disagree, 5 = Strongly agree).

### *Perception of Risks at Work*

Perceptions of risk at work was measured by a 22 item scale ( $\alpha = .94$ ) developed by Hellesoy (1985) to specifically address safety on oil rigs. Respondents indicated how safe they perceived each item (qualities of the platform or vessel, adequacy of supply instructions and precautions, chance of explosion, fire or terrorism) on a five point scale (5 = very safe, 3 = neutral, 1 = very unsafe).

### *Safety Climate*

Safety climate was assessed by the Safety Climate Questionnaire developed by Zohar and Luria (2005). This measure consists of 32 items divided into two sections of 16 items each. One section assesses top management’s commitment and priority to safety ( $\alpha = .95$ ); the other section examined the safety values, practices and priorities of one’s supervisor ( $\alpha = .96$ ). These two measures were combined into a single scale because of their high correlation ( $r = .73$ ,  $p < .001$ ).

### *Exposure to Accidents and Near Misses*

Two single items measured exposure of respondents to work accidents requiring medical attention during the past 12 months (yes/no) and to “near miss” work accidents during the past 12 months (yes/no).

### *Analysis plan*

Hierarchical regression analyses were undertaken in which the various criterion variables (e.g., perception or risk, near-miss accidents) were separately regressed on three blocks of predictors entered in a specified order. The first block of predictors, personal demographic characteristics ( $n = 2$ ) included personal demographics (age, sex). The second block of predictors ( $n = 6$ ) consisted of work situation characteristics (e.g., organizational level, job and platform tenure). The third block of predictors ( $n = 3$ ) consisted of the workaholism components. When a block of predictors accounted for a significant amount or increment in explained variance ( $p < .05$ ), individual measures within

these blocks having independent and significant relationships with those criterion variables were then identified ( $p < .05$ ). This analysis controls for both personal demographic factors and work situation characteristics before considering the relationship of the workaholism components with the health and safety outcomes of central interest.

## Results

### *Respondents*

Table 1 shows the demographic characteristics of the sample. Most respondents were male (86%), between 35 and 55 years of age (70%), were about equally represented by the two unions, were employed by the installation operator (54%), had non-supervisory jobs (71%), had long offshore and platform tenure (66% had 11 or more years of offshore tenure and 52% had 6 or more years of platform tenure), most worked 100% offshore (95%), were permanent employees (86%), worked the same work schedule 2 weeks on and 3-4 weeks off (93%), and worked in Maintenance, Drilling or Catering (26%, 19% and 16%, respectively).

### *Intercorrelation of workaholism components*

The three workaholism components were significantly and positively inter-correlated ( $p < .001$ ), reflecting, to a great extent, the large sample size. These were: work involvement and feeling driven to work,  $r = .15$ ; work involvement and work enjoyment,  $r = .18$ ; and feeling driven to work and work enjoyment,  $r = .20$ . The average inter-correlation was .18 indicating only modest relationships between the three workaholism components.

### *Inter-correlation among perceptions of risk, safety climate and accidents*

The correlations among the four health and safety outcomes were also modest: lower risk perceptions were positively and significantly correlated with more favorable health and safety values and practices ( $r = .43$ ,

$p < .001$ ); both of these were weakly correlated with "near misses" ( $r = -.12$  and  $-.09$ ,  $P < .01$ , respectively); and with accidents ( $r = -.06$  and  $-.07$ ,  $p < .05$ , respectively).

### *Perceptions of risk*

Table 2 presents results of the blocks of predictors and perception of risk in the workplace. Two blocks of predictors (work situation characteristics, workaholism components) accounted for significant increments in explained variance on this outcome.

Oil rig workers holding temporary jobs ( $B = -.12$ ), at lower organizational levels ( $B = -.09$ ), scoring higher on feeling driven ( $B = .16$ ), and oil rig workers scoring lower on work enjoyment ( $B = -.17$ ) reported higher levels of perceived risk.

### *Assessment of Safety Climate*

Table 3 shows the regression analysis predicting perceptions of safety climate. Two blocks of predictors accounted for significant increments in explained variance on the composite measure: work situation characteristics and workaholism components. Oil rig workers having less platform tenure and those at lower organizational levels appraised the safety climate less favorably ( $B = -.17$  and  $-.08$ , respectively). Finally, oil rig workers scoring higher on work enjoyment, those scoring lower on feeling driven to work, and those scoring lower on work involvement, rated the safety climate more favorably ( $B = -.19$ ,  $.11$ , and  $.12$ , respectively).

### *Predictors of accidents and near-misses*

Table 4 presents the results of hierarchical regression analyses predicting co-workers exposure to accidents requiring medical help or to "near miss" accidents in the preceding year. No block of predictors accounted for a significant amount or increment in explained variance on accidents requiring medical attention. This likely resulted from there being few such accidents in that year. Only 38 respondents (.38%) reported accidents requiring medical attention. All three blocks



**Table 1**  
Demographic Characteristics Of Sample

	N	%		N	%
<b>Age</b>			<b>Gender</b>		
35 or younger	169	16.8	Male	874	85.9
36-40	179	17.8	Female	143	14.1
41-45	195	19.3	<b>Union</b>		
46-50	186	18.5	NOPEF	490	48.2
51-55	147	14.6	OFS	527	51.8
56 or older	131	13.0	<b>Offshore tenure</b>		
<b>Employer</b>			1 year or less	4	.4
Operator	544	54.1	1 – 5	99	9.9
Contracted	320	36.8	6 – 10	237	23.7
Skip company	92	9.1	11 or more	658	65.9
<b>Organizational level</b>			<b>Platform tenure</b>		
Non-supervisory	722	71.0	Less than 1 year	107	11.0
Supervisor	123	13.6	1 – 5	359	36.9
Group leader	60	6.6	6 – 10	206	21.2
Platform manager	1	.1	11 or more	300	30.9
<b>Function</b>			<b>Time offshore</b>		
Production	89	8.8	100%	949	94.9
Administration	31	3.1	Less than 100%	51	5.1
Drilling	197	19.4	<b>Work status</b>		
Maintenance	269	26.5	Permanent	860	86.3
Service	89	8.8	Temporary	137	13.7
Deck crew	82	8.1	<b>Work schedule</b>		
Construction	3	.3	2 weeks on; 3-4 weeks off	878	92.8
Catering	165	16.2	Other	68	7.2
Other	91	9.0			

**Table 2**  
**Predictors of Perception of Risk**

Risk Perception (N=782)	R	R2	ΔR2	P
<b>Personal demographics</b>	.04	.00	.00	NS
<b>Work situation characteristics</b>	.17	.03	.03	.01
Work status (-.12)				
Organizational level (-.09)				
<b>Workaholism components</b>	.26	.07	.04	.001
Work enjoyment (-.17)				
Feeling driven (.16)				

**Table 3**  
**Predictors of Safety Climate**

Safety Climate – Total (N=793)	R	R2	ΔR2	P
<b>Personal demographics</b>	.08	.00	.00	NS
<b>Work situation</b>	.20	.04	.04	.001
Platform tenure (-.17)				
Organizational level (-.08)				
<b>Workaholism components</b>	.30	.05	.04	.001
Work enjoyment (-.19)				
Work involvement (.12)				
Feeling driven (.11)				

**Table 4**  
**Predictors of Exposure to Accidents and Near Misses**

Exposure to Accidents (N=780)	R	R2	ΔR2	P
Personal demographics	.05	.00	.00	NS
Work situation characteristics	.09	.01	.01	NS
Workaholism components	.09	.01	.00	NS
<b>Exposure to Near Misses (N=782)</b>				
<u>Personal demographics</u>				
Gender (.10)	.12	.01	.01	.01
<u>Work situation characteristics</u>	.18	.03	.02	.05
Organizational level (.12)				
<u>Workaholism components</u>				
Feeling driven (.08)	.21	.04	.01	.05
Work involvement (-.07)				

of predictors accounted for a significant amount or increment in explained variance on exposure to "near misses" however. In this case, 170 oil rig workers reported "near miss" accidents (16.8%). Men reported more near misses ( $B=.10$ ). workers at lower organizational levels reported more "near misses" ( $B=.12$ ), oil rig workers scoring higher on feeling driven to work indicated more near misses" ( $B=.08$ ), and oil rig workers scoring lower on work involvement indicated more "near misses" ( $B=-.07$ ).

## Discussion

The results provided some support for the general hypotheses underlying the research. Oil rig workers scoring higher on feeling driven to work reported fewer perceived risks, lower health and safety values and practices, and experienced more "near miss" accidents. In addition, oil rig workers scoring higher on work enjoyment reported higher assessments of risk, and a more favorable health and safety climate. Finally, and opposite to our preliminary expectations, oil rig workers scoring higher on work involvement indicated a less favorable health and safety climate and fewer "near miss" accidents.

Why might workaholism components be related to safety perceptions and accidents? Why might oil rig workers scoring higher on feeling driven to work report less positive health and safety views and more "near miss" accidents? Some speculations can be offered. Feeling driven has previously been found to be associated with higher levels of negative affect in a study of Norwegian journalists (Burke & Matthiesen, 2004); negative affect reflected in more negative feelings and experiences. Iverson and Erwin (1997) found that negative moods assessed by a measure of negative affect increased the likelihood of workplace accidents. Feeling driven has also been linked with engaging in more destructive organizational deviance (Galperin & Burke, 2006), higher levels of negative acts such as bullying (Burke, Matthiesen, Einersen, Fiksenbaum & Soiland,

2008a), and more negative evaluations of the leadership styles of one's supervisor (Burke, Matthiesen, Einersen, Fiksenbaum & Soiland, 2008b). Oil rig workers scoring higher on feeling driven then are more likely to also indicate a higher workload and greater workplace stress, to be less job satisfied, experience more negative moods, and report higher levels of psychological distress, these states are likely to increase the risk of accidents and near misses.

Oil rig workers scoring higher on work enjoyment are more likely to view their environment in optimistic and positive ways. Work enjoyment has been associated with higher levels of work satisfaction and flow at work (see Burke, 2007, for a review).

### *A caveat*

This study focused on individual difference characteristics and the role they might play in the incidence of accidents and injuries in the workplace. It is important to note that a consideration of the individual complements the potentially more important causes of accidents and workplace injuries that result from social and organizational factors (e.g., Neal & Griffin, 2006; Reason, 1997; Wallace, Popp & Mondore, 2006; Zacharatos, Barling & Iverson, 2005) These authors show how leadership, organizational support, human resource management practices associated with a high performance work system, and senior management decision making play a significant role in accounting for accidents in the workplace.

### *Limitations of the research.*

Some limitations of the research should be noted to put the results into a larger context. First, all data were collected from oil rig workers self-reports raising the possibility of common method variance and response set tendencies. Second, a few of the measures had levels of internal consistency reliability below the generally accepted level of .70. Third it is not clear the extent that our results would generalize to other occupations or to oil rig workers working in other countries.

Fourth, it was not possible to undertake multi-level analyses to examine the effects of organizational level and platform on our findings.

#### *Future research directions*

A few research directions follow from this study. First it would be worthwhile to include some objective measures of accidents and "near misses" using data obtained from company site records. Second, incorporating measures of work behaviors that are potentially unsafe would add to our understanding of ways in which stable individual difference characteristics lead to accidents or "near misses". The best predictor of accidents and near misses is unsafe job behavior (Mearns, Flin, Gordon & Fleming, 2001) Third, comparing the experiences of employees working in potentially higher risk areas (e.g., drilling) with those working in less risky areas (e.g., catering) would add some validity to the data. Fourth, adding indicators of both work and extra-work demands would complement the use of the workaholism measures and permit an examination of the ways that these demands and workaholism components may interact to impact health and safety practices and outcomes. . That is oil rig workers scoring higher on feeling driven to work because of inner pressures who also experience high work and/or extra-work demands might indicate more near misses and accidents. Fifth, more attention needs to be devoted to understand the paths (e.g., attitudes and behaviors) linking stable individual differences such as feeling driven to work and health and safety outcomes. Finally, future research should be designed so that multi-level analyses are possible.

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