

## WELLBEING AT WORK: THEORY, MEASUREMENT AND FINDINGS

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### Abstract

This chapter describes the development of the “Wellbeing Process” model which is based on the Demands-Resources-Individual Effects (DRIVE) approach developed in stress and fatigue research. This model requires measurement of many variables, and this is often not practical with established questionnaires due to their length. In order to remove this problem, a short questionnaire (the Wellbeing Process Questionnaire, WPQ) was developed and validated. This enabled the wellbeing process to be evaluated and established predictors of positive and negative appraisals and outcomes defined. Results using this measuring instrument in a range of samples from different sectors will be described. More recent surveys have used the Smith Wellbeing questionnaire (SWELL), which includes more occupational variables, or the short version of this (Short SWELL). Results from studies using SWELL will be described and results from a sample from the manufacturing sector will be reported. There is little literature on the wellbeing of those in the manufacturing sector and the study reported here fills a gap in wellbeing at work literature. In conclusion, this article reports an approach which can progress our knowledge of wellbeing at work because it involves a strong theoretical base, validated measures and is in a form which reduces logistic issues often found in data collection.

### 1. Introduction

The first part of this chapter describes the development of a “Wellbeing Process” model and the methodology associated with it. The second part describes a study which investigated

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wellbeing in workers from the manufacturing industry. The model was based on approaches to stress at work, and the next section describes recent research in this area.

## 2. Stress at Work

The section aims to review some of the research on stress and wellbeing at work that has been carried out in the last 10-15 years. The general approach adopted here is described in more detail in Smith (2011a, b). The starting point for this is the development of a case definition of work-related stress (Cox et al., 2006). This research considered the feasibility and possible nature of a case definition of work-related stress that is suitable for application in a variety of stakeholder domains. A case definition is needed in occupational health research as the basis for surveillance and for monitoring the effectiveness of interventions. Cox et al. (2006) examined definitions already applied in studies of work-related stress. They then identified major stakeholders and collected information on (i) the case definitions employed in their various fields and (ii) their views on the feasibility of developing a single case definition that could cover all areas but remain consistent with epidemiological case definitions.

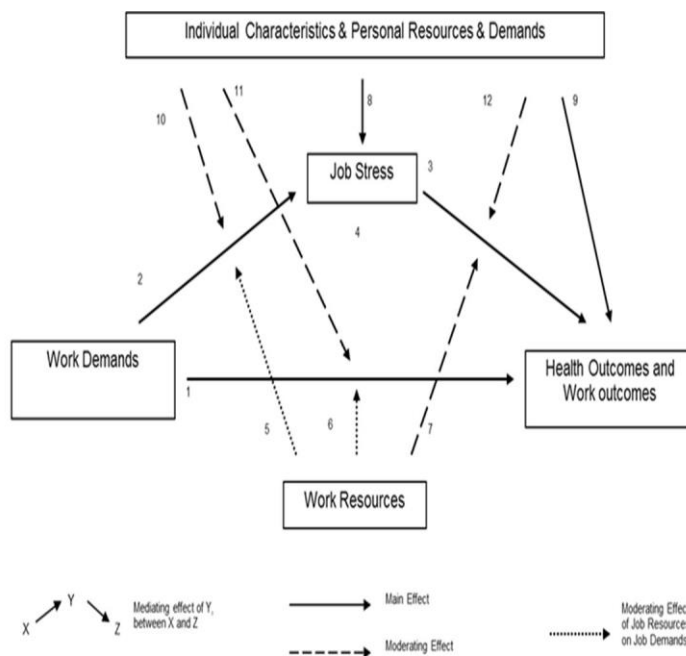
A case definition was arrived at by consensus across stakeholder groups and this case definition required the person to report:

- High levels of stress
- Unreasonable job characteristics
- Mental health problems
- Work-related problems (e.g. high sick-leave)
- The above to be work-related and not due to confounding factors

Cox et al. (2006) suggested that this definition could be used for research purposes and it is supported by recent models of occupational stress such as the Demands-Resources-Individual Effects (DRIVE) model (Mark & Smith, 2008) which is described in the next section. The DRIVE model is shown in Figure 1. It has many of the features of earlier models of stress but puts a greater emphasis on individual characteristics and personal resources. The basic model included factors from the Demand-Control-Support model (DCS) model, the Effort-Reward Imbalance (ERI) model, coping behaviours, and attributional explanatory styles as well as outcomes including anxiety, depression, and job satisfaction. These variables were categorised as work demands, work resources (e.g. control, support), individual differences (e.g. coping style, attributional style), and outcomes, although the model has a framework into which any

relevant variables can be added (Mark & Smith, 2008). The simple DRIVE model proposed direct effects on outcomes by each of the other variable groups, as well as a moderating effect of individual differences and resources on demands. A more detailed version (the enhanced DRIVE model) was also developed to acknowledge a subjective element and included perceived stress as well as further interactive effects. Research using the DRIVE model has supported the direct effects of these variable groups on outcomes, although little support has been found for interactions (Mark & Smith, 2011; Mark & Smith, 2012). Stronger support of direct effects compared to interactions has also been found in research on other models such as the DCS model, where reviews have shown that the buffering effect of control and support are less frequently obtained compared to direct effects of these variables on outcomes. Research has also shown that many of the effects of job characteristics are mediated through perceived stress (Galvin, 2016; Nelson, 2017). The research has also been extended internationally to determine which effects are general and which may be culture-specific (Capasso, Zurlo & Smith, 2016a, 2016b, 2018; Zurlo, Vallone & Smith, 2018).

Figure 1: The Demands-Resources-Individual Effects Model (Mark & Smith, 2008)



### Combined Effects of Occupational Health Hazards

The presence of independent effects of risk factors has led to another methodological feature of stress research, the combined effects approach. There has been much previous research on a large number of workplace hazards, and usually, the nature and effects of such factors have been considered in isolation. Such an approach is not likely to be representative of the real-

life workplace where employees are often exposed to multiple hazards. For example, individuals are very unlikely to work in a noisy environment that does not also expose them to other stressors that have considerable potential to harm. There is limited information on the combined effects of these hazards on health and safety. Indeed, there have been no systematic literature reviews, no attempt to produce a coherent framework for studying these factors, and a dearth of studies using a variety of methods to investigate the topic. The combined effects approach (see Smith, McNamara & Wellens, 2004, 2011) involved summing the number of negative job characteristics (or absence of positive job characteristics) to which a person is exposed. This “Total Negative Score” was then sub-divided into quartiles and logistic regressions used to examine associations between this score and the outcomes. Table 1 shows the associations between the total negative score and high stress at work. The lowest quartile was set as the comparison group, and the odds ratios show that the likelihood of being in the high-stress group increases as one goes from quartile 2 to quartile 4. The results show a linear relationship between total negative job characteristics and perceived stress at work. Mental health outcomes and accidents at work can also be examined in this way. Other results showed that a measure of exposure to combinations of workplace factors (the Negative Occupational Factors Score) was associated with several health and safety outcomes, many of which were consistent across different industry sectors. Some of the associations were due to perceived stress at work whereas others were direct effects. The combined effects approach has also been shown to be important in assessing specific problems in certain occupations such as seafarers’ fatigue. It also has strong implications for the development of stress management standards. Similarly, one can use the approach to examine wellbeing at work and address the question of what is a good job (or what factors are associated with better wellbeing and the absence of negative outcomes) and research on this topic is described in the next section.

Table 1: Associations between the total negative factors score (split into quartiles) and being in the high -stress category (defined as being very or extremely stressed at work)

	OR	CI
1st Quartile	1.00	
2nd Quartile	1.60	1.32-1.93
3rd Quartile	2.08	1.72-2.53
4th Quartile	3.84	3.17-4.66

### 3. Wellbeing at Work: What is A Good Job?

There is a substantial amount of research on negative job characteristics, occupational stress and mental health problems of workers. However, positive and negative emotions are not just the opposite ends of a continuum, and the absence of negative emotion does not mean the presence of positive emotion. Recent approaches (e.g. Waddell & Burton, 2006) have suggested that “Work is good for you.” However, detailed consideration of the literature suggests that it is the absence of work that is bad. Indeed, work per se is not necessarily going to be good – but “good work is good for you” (Smith & Wadsworth, 2011). One then has to ask “what is a good job?” This question could be answered in many different ways (e.g. from an economic point of view). However, within the present context, the question is what psychosocial characteristics associated with work are correlated with positive outcomes. A literature review (Wadsworth et al., 2010a) showed that, compared to the negative effects of work, there is very little published evidence on its positive effects. Indeed, the literature on positive aspects has many problems, such as a lack of theory, lack of data to support views and weak methodology. Measures of wellbeing are mainly outcomes and do not reflect the ‘wellbeing process’, which is necessary to understand the topic.

Secondary analyses of large-scale surveys (Wadsworth et al., 2010b) compared the effects of the presence and absence of positive/negative job characteristics. For example, the analyses considered questions such as: ‘Is the presence of social support good, the absence of social support bad, or are both true?’ This was done by splitting the scores into tertiles (three equal parts), using the mid-value as the reference value, and examining whether equal and opposite changes occurred at opposite ends of the continuum. The results from these analyses showed that dose-response did not occur for all types of association. These results show that one must examine both ends of the continuum – the presence of positive features and the absence of negative features – rather than inferring the effects of one from the other. Additional survey data, including positive job characteristics, appraisals and outcomes were also collected (Smith et al., 2011). The first question addressed was “what predicts positive outcomes?” Again, a combined effects approach was used and the “good job score”, which best predicted positive outcomes (e.g. good health; wellbeing), was the sum of the presence positive job characteristics and appraisals and the absence of negative characteristics and appraisals. An example of this is shown in Table 2, where those with the highest good job score were nearly 23 times more likely to be in the high positive health group than those in the lowest good job category.

Table 2: Associations between the good job score (shown as quartiles) and positive mental health (a median split into high/low groups)

	Odds ratio
Low good job	1.00
Second quartile	2.89
Third quartile	5.24
High good job	22.83

The research described above showed that there is a need for a multi-dimensional model of wellbeing at work that measures a wide range of job characteristics, job attitudes, individual characteristics and outcomes. The area has been developed by using surveys involving short measures of a large number of concepts, and an example of this approach has been the development of the Wellbeing Process Questionnaire (WPQ) which has been used to address many of the above issues (Williams & Smith, 2012).

#### 4. Development of the Wellbeing Process Questionnaire (WPQ)

Research on the WPQ showed that single items are often highly correlated with longer scales. This means that it is possible to have a single question measuring perceived stress, single items measuring job characteristics, and single items measuring health outcomes. In addition, possible confounding factors (e.g. personality, life outside of work) can be measured by single items. The single questions provide examples of the concept being measured and responses are made using a scale of 1-10 which allows a greater potential range of responses.

An example is shown below:

“Job Demands: I feel that I do not have the time I need to get my work done (for example I am under constant time pressure, interrupted in my work, or overwhelmed by responsibility or work demands)”

Response: on a 10-point scale from Disagree strongly to Agree strongly

An initial study (Williams & Smith, 2016; Williams, Thomas & Smith, 2017) with a sample of University staff showed significant correlations between single items and full scales (average correlation for work characteristics: 0.7; average for personality: 0.66). The predictive validity of the new items was examined by testing the Job Demands-Control-Support and Effort-Reward

Imbalance models with full scales and single items. Very similar results were obtained (i.e. predictive validity of single items was comparable to full scales; at-risk groups based on the models were identified with single items). This approach also allows removal of overlapping constructs. Use of single items enables one to use many more concepts but these often overlap, and one can determine which variables remain in the model after all have been entered into the regression. Using this technique, the following constructs remained in the model: Negative job characteristics: Demands; Effort; Over-commitment. Positive job characteristics: Rewards; Control; Support; Consultation on change; Good supervisor relationship. Positive life circumstances: Uplifts; Flourishing; Social support. Negative life circumstances: Hassles. Positive personality: Optimism; Self-esteem; Self-efficacy; Emotional stability. Negative coping: Avoidance; Self-blame; Wishful thinking. These findings were confirmed in a second study with a sample of nurses (Williams, Pendlebury & Smith, 2017).

Using the above variables, selective effects were observed. Only certain variables predicted specific outcomes. For example, work characteristics were more important for job satisfaction and job stress, whereas personality is a better predictor of positive and negative affect. Other research has examined wellbeing using longitudinal methodology (Williams & Smith, 2018a) and developed the use of the WPQ as a diagnostic tool (Williams & Smith, 2018b). A practical tool, based on the WPQ, has also been developed to evaluate wellbeing at work using contact centre methods (Williams & Smith, 2018c).

A great deal of research is in progress using the approaches described here to address additional themes. First, research has investigated stress and wellbeing at work in different sectors (call centres; the police; offshore; healthcare professionals). An example of this is shown in the next part of this chapter where a study of the wellbeing of workers from the manufacturing industry is reported. Second, additional constructs (e.g. psychological contract fulfilment – Ahmad et al., 2018a, 2018b; resilience; work-life balance and burnout – Omosehin & Smith, 2019; attitudes to training – Nor & Smith, 2018) have been examined to see how these fit into the model. Third, different outcomes have been investigated to determine whether the approach is appropriate for them (musculoskeletal disorders; accidents and incidents; absenteeism and presenteeism). This last version of the questionnaire (The Smith Wellbeing Questionnaire – SWELL – Smith & Smith, 2017a, 2017b, 2017c; Fan & Smith, 2017a, 2017b, 2018) has been used with staff from different work sectors.

Future research will also include using the approach to evaluate interventions that change working practices and offer occupation support (Smith & Cowap, 2011). The general approach outlined here is that there are some generic models of stress and wellbeing that can be applied to a range of different occupations. Quite often the difficult part is knowing how a specific context translates into more generic concepts. Audit tools are now available and can be used to assess these factors over time. Longitudinal studies are important because they provide a clearer indication of causal links and such studies have been carried out successfully using the measuring instruments described in this paper. These measuring instruments should not only include surveys but diaries and objective measurement of cognitive performance and physiology. Indeed, the development of microbiological techniques suggests that a simple objective wellbeing test may be getting closer. Objective cognitive testing can now also be carried out in remote locations and this can be supported by other forms of mobile recording.

Developments in education and training will also help those who are working away from home. Use of appropriate working away strategies can improve quality of life and subsequent wellbeing (Smith, Smith & Jelley, 2018). This can now be developed into an educational programme that enables better coping with being away from home. Stress or fatigue training has also now become more sophisticated, and one successful approach (Smith et al., 2018) has the following format:

- Education – providing appropriate information about stress or fatigue.
- Personal relevance – getting the person to consider their stress and fatigue.
- Nudges to prevent or reduce these problems – consider small manageable changes rather than trying to change the job completely.
- Personal commitment – this is a crucial part of training which will lead to use of the approach at a later date.

The next section describes a study of the wellbeing of blue-collar workers from the manufacturing sector.

## 5. Stress and Wellbeing of Blue Collar Workers

Research on stress and wellbeing at work has often used white-collar, public sector staff (e.g. teachers and nurses). However, there are studies which have examined these issues in blue collar workers. For example, there has been research with samples of blue-collar workers on effects of job characteristics such as job demands, control and support (Mostert, 2011;



Nakamura & Otsuka, 2013; Nijhuis & Smulders, 1996; Rystedt, Devereux & Sverke, 2007). Often research on blue-collar workers has focused on the physical working environment and hours of work rather than psychosocial stressors (Sutherland & Cooper, 1995). Other research (Smith et al., 2000) has investigated the scale of occupational stress and shown that it is often greater in those with higher socioeconomic status (based on the type of job). The outcomes studied have also often been different for blue collar workers. Accidents, musculoskeletal injuries and productivity have often been investigated with less emphasis on outcomes such as mental health, life satisfaction and positive affect (Burki, 2018). Studies of the wellbeing of blue-collar workers have often focused on health-related behaviours (Du Plessis et al., 2013). Given the limited research on the wellbeing of blue-collar workers, it is not surprising that there have been few studies using the DRIVE model and measures of the wellbeing process. The study described in the next section was an initial attempt to fill this gap in the research.

## 6. A Survey of the Wellbeing of Manufacturing Staff

This study was carried out with the informed consent of the volunteers and approval from the ethics committee, School of Psychology, Cardiff University. Manufacturing staff from a South Wales factory were asked to complete an online survey presented using Qualtrics software. Demographic information was collected, as was information about the department in which they worked. The majority of the questions asked about wellbeing in life generally and specifically at work. The specific questions are shown in Appendix 1. They measured concepts such as positive personality and health, noise, job demands, control and support, job satisfaction, stress, presenteeism, absenteeism and fatigue. These questions were answered using a 10-point rating scale (1 - not at all to 10 – very much so) and two yes or no responses.

One hundred and two members of staff (age range 17-64 years; 67 male) completed the survey. High levels of perceived stress were reported by 11.0% of the sample. High noise exposure was reported by 66% of the sample and 38.2% reported high levels of physical fatigue. Initial analyses considered the predictors of job-related outcomes. Musculoskeletal problems correlated with conflict at work, noise and job demands. Perceived stress at work correlated with conflict at work, excessive hours of work and job demands. Job satisfaction correlated negatively with job demands, excessive hours of work and perceived conflict at work and positively with job control. Physical fatigue correlated with excessive hours of work, job demands and noise. Mental fatigue correlated with job demands and conflict at work. Illness made worse by work correlated negatively with job demands. Presenteeism correlated

negatively with perceived conflict. Efficiency at work correlated with job control. Work-life balance correlated with excessive working hours, job demands and perceived conflict at work and negatively with job control. Happiness at work correlated negatively with job demands and positively with job control. Anxious/depressed at work correlated with all the predictor variables. A further set of analyses examined outcomes relating to life in general. Job control correlated positively with life satisfaction and perceived conflict correlated with each predictor variable (positively with negative items and negatively with positive items).

Of particular interest to the present chapter were the multivariate analyses examining predictors of positive wellbeing and negative wellbeing. Factor analysis confirmed the distinction between positive and negative aspects of wellbeing. Negative outcomes (stress; mental health problems) were predicted by negative job characteristics (e.g. demands). Positive outcomes (happiness; job satisfaction) were predicted by positive job characteristics (control/support) and positive personality (self- efficacy; self-esteem; optimism). Overall, these results confirm that the wellbeing process model can be applied to blue-collar workers and that the established predictors of positive and negative wellbeing are also important in this sample. The use of additional predictor variables measuring the physical environment and working hours, and the inclusion of job-specific outcomes such as musculoskeletal problems, demonstrate that both generic aspects of wellbeing and features which are sample specific can be investigated using the present approach.

## 7. Conclusions

This chapter has described the “Wellbeing Process Model” which was developed from the Demands-Resources-Individual Effects (DRIVE) model used in stress and fatigue research. The Wellbeing Process Model requires measurement of many variables, and this is often not feasible with long questionnaires. One solution to this problem is to use a short questionnaire (the Wellbeing Process Questionnaire, WPQ) which has short items that correlate with longer scales and has been shown to replicate associations between established predictors and positive and negative appraisals and outcomes. Results using this measuring instrument in a range of samples from different sectors have been described. More recent research has used the Smith Wellbeing questionnaire (SWELL), which includes more occupational variables. A short 10-item version of this questionnaire (Short SWELL) has also been developed and validated. Findings from studies using the SWELL have been described in the chapter and results from a sample from the manufacturing sector reported. There is little literature on the wellbeing of

blue-collar workers and the study reported here fills a gap in the wellbeing at work literature. In conclusion, this chapter reports an approach which can progress our knowledge of wellbeing at work because it involves a strong theoretical base, validated measures and is in a form which reduces practical problems often found in data collection.

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#### Appendix:

##### Wellbeing at Work Survey

1. Age (years):  
16-24 25-34 35-44 45-54 55-64 Over 65
2. Gender (M/F):
3. Department:
4. Section (If Applicable):
5. Health-related behaviours



A healthy lifestyle involves taking exercise, eating a balanced diet, not smoking, not drinking excessive amounts of alcohol, and not being overweight. To what extent do you have a healthy life style?

Not at all Very much so  
1 2 3 4 5 6 7 8 9 10

#### 6. Personality

People often describe themselves as being positive (“seeing” the glass as half full) or negative (“seeing the glass as half empty”). How would you describe yourself?

Very negative Very positive  
1 2 3 4 5 6 7 8 9 10

Thinking about the last 6 months:

#### 7. Life satisfaction

How satisfied are you with life in general?

Not at all Very much so  
1 2 3 4 5 6 7 8 9 10

#### 8. Life stress

How much stress have you had in your life in general?

Very little A great deal  
1 2 3 4 5 6 7 8 9 10

#### 9. Happiness

Would you say you are generally happy?

Not at all Very much so  
1 2 3 4 5 6 7 8 9 10

10. Anxious/Depressed

Would you say that you generally feel anxious or depressed?

Not at all

Very much so

1 2 3 4 5 6 7 8 9 10

11. Musculo-skeletal problems

Do you suffer from musculo-skeletal disorders (e.g. arthritis; back pain; sciatica; repetitive strain injury)?

Not at all

Very much so

1 2 3 4 5 6 7 8 9 10

12. Noise

Are you exposed to distracting noise at work? (Please think about noise within your work area – including the office environment)

Not at all

Very much so

1 2 3 4 5 6 7 8 9 10

13. Hours of Work

Do you consider the hours you work to be excessive (please include any work you carry out at home)

Not at all

Very much so

1 2 3 4 5 6 7 8 9 10

14. Job demands

How demanding do you find your job (e.g. do you have constant pressure, have to work fast, have to put in great effort)?

Not at all demanding

Very demanding

1 2 3 4 5 6 7 8 9 10

15. Job control and support

Do you feel you have control over your job and support from fellow workers?

Not at all

Very much so

1 2 3 4 5 6 7 8 9 10

16. Perceived stress at work

How much stress do you have at work?

Very little

A great deal

1 2 3 4 5 6 7 8 9 10

17. Jobsatisfaction

Are you satisfied with your job?

Not at all

Very much so

1 2 3 4 5 6 7 8 9 10

18. Physical fatigue

How physically tired do you get at work?

Not at all tired

Very tired

1 2 3 4 5 6 7 8 9 10

19. Mental fatigue

How mentally tired do you get at work?

Not at all tired										Very tired
1	2	3	4	5	6	7	8	9	10	

20. Illness caused or made worse by work

Have you had an illness (either physical or mental) caused or made worse by work?

Yes/No

21. Presenteeism

Do you ever come to work when you are feeling ill and knowing you can't do your job as well as you would like to?

Yes/No

22. Efficiency at work

How efficiently do you carry out your work?

Not very efficiently										Very efficiently
1	2	3	4	5	6	7	8	9	10	

23. Work-life balance

Do you find your job interferes with your life outside work or your life outside of work interferes with your job?

Never										Very often
1	2	3	4	5	6	7	8	9	10	

24. Happy at Work

Are you happy at work?

Never									Very often
1	2	3	4	5	6	7	8	9	10

25. Anxious/Depressed because of work

Are you anxious or depressed because of work?

Never									Very often
1	2	3	4	5	6	7	8	9	10

26. Perceived Conflict

Do you experience conflict with colleagues at work?

Never									Very often
1	2	3	4	5	6	7	8	9	10

27. Absenteeism

Approximately how many days sick leave have you had in the last 12 months? \_\_\_\_\_