



A business case for the Management Standards for stress

Prepared by the **University of London**
for the Health and Safety Executive 2006

RESEARCH REPORT 431



A business case for the Management Standards for stress

Frank W Bond BSc (Hons), PG Diploma, MSc, PhD, CPsychol
Paul E Flaxman BSc (Hons), MSc
Sharon Loivette BSc (Hons), MSc

Goldsmiths College
University of London
New Cross
London
E14 6NW

The aim of this report is to review the extant literature, in order to determine the extent to which effectively managing some or all of the six key sources of occupational stress, specified in the Management Standards, is associated with beneficial business outcomes. These six stressors, or working conditions, are demands, control, support, relationships, role, and change. The results of meta-analyses and literature reviews lead to the conclusion that there is at least some high quality evidence of a business case for each stressor area, although the case is stronger for some working conditions. Evidence is greatest for control, where even intervention studies show that targeted low-impact change programmes, which essentially applied the Management Standard of control, have significant, and very meaningful, effects on business outcomes. The business case appears weakest for demands. In particular, high demands only have meaningful and consistent deleterious effects on business outcomes in laboratory experiments. In actual work organisations, high demands are not a good predictor of any business outcome, except when they are accompanied by lower levels of control.

This report and the work it describes were co-funded by the Health and Safety Executive (HSE). Its contents, including any opinions and/or conclusions expressed, are those of the authors alone and do not necessarily reflect HSE policy.

© Crown copyright 2006

First published 2006

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means (electronic, mechanical, photocopying, recording or otherwise) without the prior written permission of the copyright owner.

Applications for reproduction should be made in writing to:
Licensing Division, Her Majesty's Stationery Office,
St Clements House, 2-16 Colegate, Norwich NR3 1BQ
or by e-mail to hmsolicensing@cabnet-office.x.gsi.gov.uk

CONTENTS

EXECUTIVE SUMMARY	IV
1. BACKGROUND AND RESEARCH OBJECTIVES	1
2. METHOD	3
2.1 CONDUCTING THE LITERATURE SEARCH	3
2.2 CHOOSING THE UNIT OF ANALYSIS AND OBTAINING THE EFFECT SIZE INDEX	5
2.3 STATISTICALLY ANALYSING THE EFFECT SIZE DISTRIBUTION	6
3. RESULTS	7
3.1 CONTROL	7
3.2 SUPPORT	12
3.3 RELATIONSHIPS	14
3.4 ROLE	17
3.5 DEMANDS	19
3.6 CHANGE	22
4. DISCUSSION	24
5. IMPLICATIONS AND RECOMMENDATIONS	28
5.1 THE NEED FOR MORE QUASI-EXPERIMENTAL OUTCOME STUDIES	28
5.2 THE MANAGEMENT STANDARDS APPROACH MAY LEAD ORGANISATIONS TO REDUCE SEVERAL STRESSORS AT ONCE: WILL THIS WORK AND, IF SO, HOW?	28
5.3 WHAT TYPE OF RESEARCH PROGRAMME IS NOW NEEDED?	29
6. REFERENCES	31
7. APPENDIX 1: EXCLUSION CRITERIA	37

EXECUTIVE SUMMARY

The Health and Safety Executive's Management Standards advocate a preventive, population-based approach to reducing work-related stress. This approach involves targeting six main working conditions (i.e., **demands, control, support, relationships, role, and change**) and specifying management practices that will help to ensure that these potential sources of stress do not actually act as stressors for employees. In this way, it is hoped that the Management Standards will promote better mental health (or less stress) and business, or productivity outcomes (defined herein as decreased absenteeism, lower turnover, and better performance). Whilst sufficient evidence suggests that successfully managing these six working conditions will improve mental health, it is far less clear as to whether business benefits may accrue from such effective management. The aim of this report is to review the extant literature, in order to determine the extent to which effectively managing some or all of the six potential stressors is associated with beneficial business outcomes.

To fulfil this aim, we conducted a number of meta-analyses on quantitative studies that examined the effect that the six working conditions have on business outcomes. In addition, we have summarised and discussed this research literature, in order to provide a more comprehensive understanding of it. Table 1 (overleaf) summarises the major findings.

The most convincing evidence for a business case was seen for **control**. Nineteen longitudinal studies or laboratory experiments consistently showed that higher levels of this working condition led to better business outcomes. Impressively, eight of these studies showed a (very desirable) small-to-moderate statistical impact on objectively measured performance.

There is clear evidence that higher levels of **support** lead to better business outcomes, particularly for objectively measured performance. However, the number of studies that have examined such relationships, and the consistency of their findings, make the business case for support, whilst good, not as strong as it is for control.

Relationship problems appear to have their greatest effect by reducing team performance and increasing withdrawal behaviours, which are productivity-related outcomes including absenteeism, tardiness, neglecting work tasks, and producing poor quality work. In contrast, **role** problems seem to have their greatest impact by increasing turnover intention and undermining how people perceive they perform their job, but not on how other people perceive they do their job; nor do such problems appear to impact upon people's performance, as measured by objective outcomes.

There is a small, but promising, evidence base that suggests that detailed and accurate communication about organisational **change** processes reduce turnover intention. There is also one study that links such detailed and accurate communication to better performance ratings and lower absence levels.

The business case appears weakest for **demands**. In particular, high demands only have meaningful and consistent deleterious effects on business outcomes in laboratory experiments. In actual work organisations, high demands are not a good predictor of any business outcome, except when they are accompanied by lower levels of control.

Four out of five rigorous studies clearly demonstrated that increasing job control paid off considerably in terms of improving absenteeism, turnover, or performance (objectively

measured and as rated by others). In many ways, these findings from the intervention studies speak more directly to the potential business benefits that may accrue from an organisation implementing the Management Standards. They show that targeted low-impact interventions, which essentially applied the Management Standard of **control**, have significant, and very meaningful, effects on business outcomes.

Finally, four studies demonstrated that businesses can make significant financial savings, and reduce absence rates, by increasing levels of job **control**.

More longitudinal studies are needed to examine relationships between the six working conditions and business outcomes; however, for the purposes of validating and promoting the Management Standards, what would be more useful are quasi-experimental outcome studies that investigate the effects that the Management Standards approach has on business outcomes (as well as, of course, on mental health and attitudinal outcomes).

Table 1 Working conditions and their impact on business outcomes

Greater control	<i>Leads to →</i>	Better performance, objectively measured Better performance ratings Less absenteeism Less turnover intention
Better support	<i>Leads to →</i>	Better performance, objectively measured Better performance ratings Less absenteeism Less turnover intention
Better work relationships	<i>Lead to →</i>	Less withdrawal behaviours Better team performance Less absenteeism Less turnover intention
Well-designed roles	<i>Lead to →</i>	Less work withdrawal Better self-rated performance Less turnover intention
Greater demands	<i>Lead to →</i>	Better performance, objectively measured (<i>in lab studies</i>) Better performance ratings (<i>in lab studies</i>) Less absenteeism (<i>when demands are accompanied by low levels of control</i>)
More effective change management and communication	<i>Lead to →</i>	Better performance ratings Less absenteeism Less turnover intention

1. BACKGROUND AND RESEARCH OBJECTIVES

The Health and Safety Executive (HSE) define stress as the adverse reaction (i.e., mental, physical, or behavioural) that people have to excessive pressure, or other types of demands placed on them. The HSE are particularly concerned with stress associated with working conditions, and justifiably so; survey research (Jones, Huxtable, Hodgson, & Price, 2003) indicates that up to 5 million people in the United Kingdom (UK) feel ‘very’ or ‘extremely’ stressed by their work, with approximately half a million experiencing this type of stress at a level that they believe is making them ill. Furthermore, this survey indicates that work-related stress costs British society about £3.7 billion every year (at 1995/6 prices). Consistent with this finding, research shows that people who are less stressed are also more productive at work (Cropanzano & Wright, 2001). The question that emerges from this literature is, what can be done to address this predicament?

In June 2000, the HSE proposed a method of tackling this work-related stress problem that focused on promoting good management practice within organisations. Essentially, they were advocating a preventive, population-based approach to dealing with this costly dilemma: a strategy that is advocated by leading researchers in the field of occupational health (e.g., Parker, Jackson, Sprigg, & Whybrow, 1998; Sauter, Murphy, & Hurrell, 1990). Over the following four years, the HSE engaged in widespread consultation that involved academics, practitioners, and employers. From this exercise, and related scientific research (e.g., Cox, 1993), six key sources of occupational stress, or ‘stressors’, were identified:

- *Demands* – aspects of work to which people have to respond, such as work load, work patterns, and the work environment
- *Control* – the extent to which people have a ‘say’ in the way they do their work
- *Support* – the encouragement, sponsorship, and resources provided by the organization, line management, and colleagues
- *Relationships* – promoting positive working to avoid conflict, and dealing with unacceptable (e.g., bullying) behaviour
- *Role* – the extent to which people understand their role within the organisation, and the degree to which people do not have conflicting roles.
- *Change* – the extent to which organisational change (large or small) is effectively managed and communicated within the organisation.

The Management Standards target these six main stressors, by specifying the management practices, or ‘states to be achieved’, that will help to ensure that these working conditions do not actually act as stressors for employees. In fact, it is hoped that the Management Standards will ensure that these states to be achieved will promote better mental health (or less stress) and business (or productivity) outcomes (e.g., decreased absenteeism, lower turnover, and better performance). Whilst sufficient evidence exists to suggest that successfully targeting these six sources of stress will improve mental health (see Mackay, Cousins, Kelly, Lee, & McCaig, 2004), it is far less clear as to whether business benefits may accrue from such effective targeting. The aim of this report was to examine existing research, in order to determine the extent to which effectively managing some or all of the six potential stressors is associated with beneficial business outcomes. To this end, the objectives of this project were to establish, where possible, the extent to which existing research shows that:

1. Each of the six HSE sources of stress (that the Management Standards address) predicts business outcomes.
2. Interventions can improve business outcomes by improving one or more working condition (typically through a work reorganisation intervention).

3. Businesses can make net financial savings, when improving working conditions (e.g., by increasing levels of control through a work reorganisation intervention).

2. METHOD

In order to meet these three objectives, we conducted a number of meta-analyses, and we also summarised the relevant research literature, in order to provide a more comprehensive understanding of it. In performing the meta-analyses, we based our procedure on recommendations by Durlak (1995). Thus, the first step in this process was to identify the methodological criteria that research studies must have met, in order to have been included in the meta-analysis, and there were two. The first was that studies needed to test whether a source of stress predicted a business outcome over time (e.g., whether control predicted absenteeism over a six month period). The second design characteristic was that a business outcome must have been measured at the first and all subsequent observation points. This allows researchers to ensure that any longitudinal relationship between a working condition (e.g., control) and a business outcome (e.g., job performance) is not due to a ‘third variable’. For example, workers who have a high IQ (the third variable) are clever and thus trusted by their managers who reward them with more control over how they do their work; these clever people are also better able to perform effectively. Given this scenario, control and performance will clearly correlate, but this association may not have anything to do with control causing better performance; rather, it is due merely to the fact that both are caused by IQ. This third variable problem can only be resolved when studies measure a business outcome at all observation points. (For the purposes of the present research, studies need only to measure a source of stress at the baseline.)

In this report, we refer to research that fulfils these two methodological criteria as having a *longitudinal design*. Studies that do not measure the same business outcome at a first (and subsequent) time point, or that measure both variables (i.e., the stressor and business outcome) at only one time point, are referred to here as having a *cross-sectional* design. Data from these types of studies do not provide convincing evidence that working conditions affect business outcomes. As a result, we shall present findings from, and base our conclusions on, cross-sectional research, only when longitudinal studies have not been used to examine a particular stressor-business outcome relationship. In such a case, though, we cannot speak at all to ‘cause and effect’, as we can, to some degree, with longitudinal research; instead, we can just conclude that two variables are related, to a specific degree.

The second objective of this research (i.e., determining whether interventions can improve business outcomes by improving a working condition) can only be convincingly achieved by reviewing studies that use a special type of longitudinal design, which is called quasi-experimental. Here, the effects of an intervention (e.g., increasing levels of job control) are compared against findings from a similar group of workers who do not receive the intervention (i.e., the control group). In order to fulfil this objective, we only analysed intervention studies that used this type of design.

Further, specific details of the exclusion criteria that we used are noted in Appendix I.

2.1 CONDUCTING THE LITERATURE SEARCH

In this second step of conducting the meta-analyses, we sought to obtain a representative and non-biased sample of relevant studies, in the context of having six weeks to do so. We accomplished this aim through three major techniques: computer-driven database searches, manual searches (or trawls) through particularly relevant journals, and examining the reference lists of each identified study (Durlak, 1995). In addition, we emailed a number of experts in the field, in order to ask them whether they knew of, or possessed, any published or unpublished studies/data that might inform any of our three objectives. We now provide further details of these four literature search techniques.

2.1.1 Computer-driven database searches

We searched the following databases, over the years 1989- August 2004, for relevant research articles that have been published in the English language: PsycINFO, BIDS and Web of Science. These were chosen, due to their coverage of psychology, sociology, management, and organisational studies. In Table 2.1.1, we list the search terms that were entered into these three databases, in order to identify relevant studies relating to the six sources of stress.

2.1.2 Manual searches

In order to ensure that we found as much pertinent research as possible, we hand trawled particularly relevant journals (over the years 1999-2004) that have been identified as the top ones in the field (Daniels, Jones, Ferguson, Perryman, & Rick, 2004). These were:

- Academy of Management Journal
- Journal of Applied Psychology
- Journal of Organizational Behavior
- Journal of Occupational Health Psychology
- Journal of Occupational and Organizational Psychology
- Organizational Behaviour and Human Decision Processes
- Work & Stress

Table 2.1.1 Search terms used for the computer-driven database searches

<i>Management Standard area</i>	<i>Sources of stress (search terms)¹</i>	<i>Business outcomes (search terms)</i>
<i>Control²</i>	Job control; work* control; task control; auton*; participati*	Absen*; sick*; turn*; leave*; quit*;withdraw*;performance; productivity; profit*
<i>Demands</i>	Demand*; work load; See note below ³	Same as above
<i>Support</i>	Work* support; super* support; mang* support; organi* support	Same as above
<i>Change</i>	Organ* change AND information/ communication/ involvement/ consultation	Same as above
<i>Role</i>	Role clarity/ conflict/ overload/ ambiguity/ stress/ strain/ stressor	Same as above
<i>Relationships</i>	Bullying; mobbing; harassment; interpersonal conflict; workplace relationships; workplace mistreatment; workplace victimization; workplace incivility	All of the above, plus grievance; litigation

¹Note. ¹When an asterisk (*) is at the end of a term, a computer search captures any study that uses that term, regardless of its suffix (e.g., participati* locates studies that use the term participating, participation, participative, or participatory).² The terms 'skill discretion' and 'discretion' were not used as search terms for control as research demonstrates, and it is now widely accepted, that they refer to skill variety and not control (e.g., see Smith, Tisak, Hahn, & Schmieder (1997) for details).³As discussed in Section 3.6, demands is an over-generalised concept that is difficult to isolate from other work design constructs (e.g., role overload). As a result, we additionally identified studies examining Demands, through our searches for the other five working conditions (which proved much more successful).

2.1.3 Examining the reference lists

For each germane study identified, we inspected the reference lists, as another strategy for ensuring that we were identifying as much relevant research as possible, in the time available.

2.1.4 Contacting experts in the field

We emailed 8 experts in the field, asking them if they knew of any relevant studies/data, published or unpublished. Four of these people replied, and they provided us with no relevant unpublished studies, or published ones that we had not already identified.

2.2 CHOOSING THE UNIT OF ANALYSIS AND OBTAINING THE EFFECT SIZE INDEX

2.2.1 Unit of analysis

As noted above, the overall purpose of this report is to examine and summarise existing research, so as to determine the extent to which business benefits may accrue from managing working conditions that lead to stress. This focus provides a fairly clear direction as to the basis upon which we should average findings from relevant studies. For each of the six sources of stress, we summarised data from different studies, along business outcome constructs that are typically investigated by researchers. Specifically, for each of the six sources of stress, we describe our findings along the following dimensions:

- Objective measures of performance (e.g., sales targets achieved, error rates acquired, system downtime)
- Performance ratings (e.g., supervisor or customer ratings)
- Absenteeism rates
- Turnover (usually measured by people rating their intention to leave their job)

The implication of this categorisation scheme is that different measures of, for example, objective performance (e.g., sales targets, processing targets, and input errors) are all grouped together and then summarised. This has the advantage of providing readers with a concise, usable summary of research that may better influence their compliance with the Management Standards. Nevertheless, we also discuss individual studies, so as to show what type of performance outcome (e.g., sales targets, supervisor performance ratings) each examined.

2.2.2 Effect size

This is the key index in a meta-analysis. It serves as the common metric into which we change information from disparate studies: in this way, studies that vary in terms of statistics, sample sizes, and other important features, can be integrated (along the four business outcome dimensions just noted), and their individual findings summarised in a quantitatively meaningful manner. In meta-analyses such as the present ones, an effect size indicates the magnitude, or strength, of a relationship between two variables; for example, the degree to which job control impacts upon objective measures of performance, across a number of studies.

The *size*, or magnitude, of an effect should be distinguished from whether or not an effect is statistically *significant*. If a finding is significant, all we can say is that 'A is related to B' (e.g., control is related to absenteeism). We cannot use the significance level to interpret the *degree* to which the variables are related (Cohen, 1994); that is, an association that is significant at $p < .001$ is not necessarily stronger than one that is significant at $p = .05$. To understand the magnitude of a significant relationship, we need to obtain its effect size. As an illustrative example, consider this: significance level speaks only to *whether or not* a specific drug treats a certain disease; whilst, the effect size tells us the *degree* to which it does so, and the degree to which it does so can range from 'statistically significant yet clinically meaningless' (i.e., the

patient won't really notice a change) to 'statistically significant and extremely effectively' (i.e., the patient is cured).

Clearly, effect size information is very important when taking decisions on the best medical treatment available, but it is also important for taking business decisions. That is, just because a particular business strategy might result in a statistically significant improvement in savings, it does not mean that it is actually saving the organisation a meaningful amount of money. Due to this limitation of significance testing, researchers and academic journal editors emphasise the need to convey not just significance levels but an effect size index, as well, when reporting research findings (American Psychological Association, 2001; Cohen, 1994). In this report, we do note whether findings are significant; but, consistent with best practice guidelines (e.g., Cohen, 1994), we also base our conclusions on an effect size index. Given the nature of our research objectives, discussed above, we use the *correlation coefficient* as this indicator.

2.3 STATISTICALLY ANALYSING THE EFFECT SIZE DISTRIBUTION

To aggregate correlation coefficients for this piece of research, we used the statistical program, Meta-Analysis Mark IX (Steel, <http://www.ucalgary.ca/~steel/procrastinus/meta/meta.html>). In using this program, we summarised effect sizes, using procedures specified by Hunter and Schmidt (1990) and Rosenthal and DiMatteo (2001); specifically, we:

1. used inverse variance weights, so as to give more influence to studies with larger sample sizes. We did this because an effect size based on 100 participants, for example, is assumed to be a more 'precise' estimate of the population effect size than is one based on 10 participants.
2. performed a Fisher's Z to r transformation for the correlation coefficients, as this is standard practice in meta-analyses.
3. accounted for measurement error, because it is rare that many variables (especially self-report ones) are assessed perfectly (in terms of reliability). This means that the scores observed on the measures of these constructs differ from their 'true' scores. To account for this error, we used a formula consistent with that described by Hunter, Schmidt, and Jackson (1982).
4. calculated *confidence intervals* for each correlation coefficient, using Hunter and Schmidt's (1990) formula. These indicate the range that a coefficient is 95% likely to fall within, in the 'real world' (or population). If a confidence interval includes the value '0', then there is no significant correlation between the variables being assessed.

Together, these meta-analytic procedures help to produce more accurate effect size estimates, than merely obtaining means of correlation coefficients across individual studies. In the following section, we present and discuss the meta-analytic findings for each of the six sources of stress, in turn.

3. RESULTS

3.1 CONTROL

The HSE define control as the amount of ‘say’ that people have in the way that they do their work. People can have control over many aspects of their work, including its pacing, timing, scheduling, and even its definition.

The research with regards to control is clear: higher levels of this work organisation characteristic predict better business outcomes. Specifically, as detailed in Table 3.1, higher levels of control longitudinally predict better objective measures of performance and performance ratings, as well as lower levels of absenteeism and turnover intention. These conclusions are based upon a relatively small number of longitudinal studies, so, as for each standard, more research is needed, in order to understand the organisational and individual employee characteristics that maximise the impact that higher levels of control have on these business outcomes. That said, there are considerably more longitudinal studies that examine the impact of control on business outcomes, than there are for any of the other Management Standards. As a result, we can be most confident of the accuracy and reliability of the control findings.

Table 3.1 Meta-analyses of the relationships between higher levels of control and various business outcomes

<i>Business outcome</i>	<i>Number of studies</i>	<i>Effect size</i>	<i>95% Confidence interval</i>	<i>Size and significance of effect</i>
Objective performance	8	.23	.19 – .27	Small-to-medium and significant
Performance ratings	3	.32	.28 – .37	Medium and significant
Absenteeism	4	-.11	-.15 – -.08	Small and significant
Turnover intention	4	-.21	-.26 – -.16	Small-to-medium and significant

As can be seen, a plurality of the studies summarised in Table 3.1 examined the relationship between job control and objective performance. Importantly for a business case, they showed that higher levels of control lead to better levels of objectively measured performance in both the laboratory (Dodd & Ganster, 1996; Jimmieson & Terry, 1997; Parkes et al., 1990; Searle et al., 1999; 2001) and organisational settings (Bond, in press; Bond & Bunce, 2003; Wall et al., 1992). Demonstrating such a relationship in a laboratory is important, because in that context, other potential determinants of objective performance can be rigorously accounted for (e.g., intelligence, time pressure, volume and difficulty of work); as a result, when we do find that control determines objectively measured performance under such stringent conditions, we can be as sure as is possible that this conclusion is accurate and not spurious. In the five relevant laboratory experiments that we found, higher levels of control led to better performance on the following objective indicators: identifying and correcting computer input errors (Dodd & Ganster, 1996); sorting through an ‘in-basket’ (Jimmieson & Terry, 1997); and, performing a simulated mail sorting task (Parkes et al., 1990; Searle et al., 1999; 2001).

Whilst longitudinal research conducted in organisations does not have the precision that laboratory experiments possess, such research has more ecological validity; that is (defined for the current discussion), it shows that control can affect objective measures of performance, even when other ‘real world’ factors (e.g., work volume and pace) are also influencing behavioural

effectiveness. In the three relevant studies conducted in organisational settings that we found, higher levels of control led to better performance on the following objective indicators: meeting work processing targets (Bond, in press); identifying and correcting computer input errors (Bond & Bunce, 2003); and system uptime (Wall et al., 1992). The first two studies were conducted in two different UK banks, and the third one occurred in a UK plant of a U.S. engineering company.

The longitudinal studies that have investigated the links between higher levels of job control and performance ratings, absenteeism rates, and turnover rates are listed in Table 3.1.1 (overleaf). They were conducted in a range of public and private sector organisations in the US, Europe, and Australia. As a result, the findings from these studies are not only consistent in showing various business benefits for control, but they also generalise to different countries and economic sectors.

Table 3.1.1 Longitudinal studies that investigate the links between job control and performance ratings, absenteeism, and/or turnover

<i>Business outcome</i>	<i>Study author(s)</i>
Performance ratings	Bond & Bunce, 2001; Greenberger, Strasser, Cummings, & Dunham, 1989; Griffin, 1991
Absenteeism	Bond & Bunce, 2001; Bond, Flaxman, & Bunce, submitted; Griffin, 1991; Wahlstedt & Edling, 1997
Turnover/Turnover intention	Bond et al., submitted; Griffin, 1991; Landsbergis & Vivona-Vaughan, 1995; McFadden & Demetriou, 1993

It is important to note that the relationship between low levels of job control and increased absenteeism, shown in Table 3.1, is further supported by several large-scale prospective cohort studies that have been conducted with British civil servants (the Whitehall II study; e.g., North et al., 1996); Finnish municipal workers and hospital physicians (e.g., Ala-Mursula et al., 2004; Kivimäki et al., 1997; 2001; Vahtera et al., 2000); employees of the French national electricity and gas company (the GAZEL cohort; e.g., Melchior et al., 2003; Niedhammer et al., 1998); and various occupational groups in The Netherlands (e.g., Ariens et al., 2002; Smulders & Nijhuis, 1999). As the results of these studies are reported in the form of rate (or odds) ratios, they do not contain sufficient statistical information for inclusion in our meta-analyses for the control standard (summarised in Table 3.1); despite this, we very briefly note their findings, as these well designed studies were conducted over several years, and they obtained reliable sickness absence data from company records. Taken together, the results of these studies suggest that employees who report low levels of job control have between 20% and 50% higher rates of sickness absence, than those who report high levels of job control. Importantly, this relationship between job control and subsequent absenteeism is evident even after controlling for demographic characteristics (e.g., age, occupational status, grade), and lifestyle factors (e.g., health-related behaviours).

3.1.1 Can a work redesign intervention improve business outcomes by increasing job control? A review of the evidence

In order to establish that a work reorganisation intervention can improve business outcomes, as a result of increasing job control, it is necessary to conduct a study that uses a quasi-experimental design. This type of study employs two groups: one that receives a job control enhancement intervention, and the other which serves as a control group, receiving no such intervention. Only by comparing the changes in the intervention group, against those that may

have occurred in the control group, can one determine the extent to which the job control intervention, itself, was responsible for any identified changes.

The interventions themselves typically involve the implementation of ‘participative’ initiatives, which are designed to provide employees with a greater say over how they complete and manage their work tasks. Only five quasi-experiments examined the ability of this type of job control-enhancing intervention to improve business outcomes. As we now outline, all but one of these five rigorous studies clearly demonstrate that efforts to increase job control pay off considerably in terms of improving absenteeism, turnover, and performance ratings.

- *Bond and Bunce (2001)*: This quasi-experiment showed that a work reorganisation intervention was significantly able to improve self-rated performance, almost to a large degree ($\eta^2 = 0.22$); and, it significantly reduced absenteeism to a medium extent ($\eta^2 = 0.09$), over a one year period. (According to Cohen (1977), effect sizes, measured using partial eta-squared (η^2), are small at 0.01, medium at 0.09, and large at 0.25.) In addition, these researchers demonstrated, statistically, that these two improvements occurred as a direct result of the increases that were seen in people’s levels of control. The control group experienced none of these improvements. This study was conducted in a UK central government department.
- *Bond, Flaxman, and Bunce (submitted)*: This quasi-experiment showed that a work reorganisation intervention was able significantly to reduce absenteeism and turnover, over a one-year period; and, it was able to impact both of these outcomes, to a medium extent ($\eta^2 = 0.13$ and 0.10 respectively). As with the previous study, Bond et al. showed statistically that these two improvements resulted directly from the increase in control that employees in the intervention group experienced, during the year of the study. This study was conducted in a UK financial institution.
- *Griffin (1991)*: This study showed that a work reorganisation intervention, designed to increase job control (specifically responsibility, authority, and accountability), improved, over a four-year post-intervention period, performance to a medium extent ($\eta^2 = 0.19$), and turnover propensity to a small-to-medium extent ($\eta^2 = .08$). This study occurred in a financial institution in the US.
- *Landsbergis and Vivona-Vaughan (1995)*: In this quasi-experimental study, which was conducted in a US public health agency, a participative work reorganisation intervention did not increase job control or reduce turnover intention. These researchers discussed a number of obstacles that interfered with the implementation of their intervention, including a lack of management commitment, and the negative impact of organisational changes that were unrelated to the participative intervention.
- *McFadden and Demetriou (1993)*. This quasi-experiment was conducted in high turnover branches of an Australian bank. It showed that a participative intervention that aimed to improve job control, amongst other aspects of work design (e.g., revising supervisory arrangements), decreased turnover by 13% in a six month post-intervention period, when compared to the same period in the previous (pre-intervention) year. Additionally, the post intervention turnover rate was 5% lower in the intervention group than it was in the control group.

In many ways, these positive intervention study findings speak more directly to the potential business benefits that may accrue from an organisation implementing the Management Standards. In that, they show that low-impact interventions (as described below) have significant, and overwhelmingly medium-to-large sized, effects on business outcomes. Importantly, these relatively low-impact interventions are likely to be of a similar type to those that stem from the focus group/consultative method that the Management Standards advocate. After all, the above studies used such a method to achieve their aims, and they showed that they were able to do so very successfully. These

findings, it would appear, auger well for the success of the Management Standards approach, in terms of improving business outcomes.

3.1.2 Interventions to increase job control: A little goes a long way

As just noted, the above intervention studies achieved their positive benefits through fairly low-impact changes. For example, Bond and Bunce (2001) used a steering (or focus) group to identify ways to increase people's job control over areas of work that people found problematic; in particular, this group identified ways to increase their control over the way work tasks were distributed to people. This change was easily implemented, but, in addition to the meaningful reductions in absenteeism, noted above, it also improved people's motivation, mental health and self-rated performance. Likewise, Bond et al.'s (submitted) intervention was similarly low impact and easily implemented. Whilst it, importantly, reduced absenteeism and turnover, this small intervention also improved people's mental health and motivation levels. Finally, Griffin (1991) implemented change programmes that provided employees with the opportunity to take control over a number of discrete aspects of their work; these changes cost the employers little to make, and they were relatively easy to implement; yet, they had beneficial impacts on employees' performance levels and job satisfaction. As can be seen from each of these studies, low impact work redesign interventions have meaningful effects on *both* business outcomes and stress/mental health outcomes. Put another way, these rather small interventions have a disproportionate impact on business, attitudinal, and mental health outcomes.

3.1.3 Is even a small effect size meaningful in terms of business outcomes?

In summarising the job control findings, it would appear that this work characteristic has, consistently, a small-to-medium sized effect on business outcomes. The size of this effect may not suggest to organisations that job control is an important variable to increase, when trying to improve productivity. There is evidence, however, that this conclusion would not be an accurate one to draw.

Specifically, a large number of variables determine business productivity, ranging from macro-economic ones, through to company strategy, and down to the individual characteristics of workers. So, that a variable, such as job control, can account for 5%¹ of objective performance, performance ratings, absenteeism, and turnover is fairly impressive. To understand how notable, we can examine the productivity benefits, mainly financial savings, that specific organisations have made by increasing job control. To this end, we can look to the very few intervention studies, listed below, that have tested the impact that increasing job control has had on *financial savings and absence rates*. Those that exist have shown the following:

- *Bond and Bunce (2001)*: A longitudinal, quasi-experiment showed that 46 employees in a public-sector UK organisation saved an average of 64 working days per year (as compared to their previous year's absence rate and to a control group), as a direct result of an intervention that increased their level of job control. Consistent with the findings from the above meta-analyses (in Table 3.1), this effect size of job control on absence reduction was of a small-to-medium size. If such a meaningful reduction in absence was made in such a small group, it is interesting to think how much greater the reduction could have been, if more people had been included in the study.
- *Bond et al. (submitted)*: A longitudinal, quasi-experiment showed that (only) two call centres of a UK financial institution saved £105,164 in short-term absence costs over a one year period (as compared to their previous year's absence rates and to a control call centre). These savings occurred as a direct result of an intervention that increased

¹ This 5% statistic was arrived at by squaring the average effect size for the impact of job control on all business outcomes shown in Table 3.1. This mean was .22. The square of .22 (which is a correlation coefficient) produces the variance shared between the two variables.

employees' levels of job control. Again, consistent with the findings from the meta-analyses in Table 3.1, the effect size of job control's impact on savings in absence costs was small (as shown by a partial eta-squared of .02: a small effect according to Cohen (1977)). (The financial organisation determined these costs-savings, based only upon the amount paid in overtime and on temporary cover for those on short-term absence (i.e., 1 day to 2 weeks.)). Given that this financial institution had over 10 call centres, the amount that they could save in absence costs alone, as a result of increasing job control across all their call centres, is substantial, even though job control only had a 'small' statistical effect on these direct costs.

- *McFadden and Demetriou (1993)*. A longitudinal, quasi-experiment, which was conducted in high turnover branches of an Australian bank, showed that a participative intervention that aimed to improve job control, amongst other aspects of work design (e.g., revising supervisory arrangements), decreased turnover to a significant, but small degree. Despite the small size of this statistical effect, actual turnover decreased 13% in a six month post-intervention period, which was compared to the same period in the previous (pre-intervention) year. Additionally, the post intervention turnover rate was 5% lower in the intervention group than it was in the control group. Importantly, it was estimated that this 13% decrease in turnover saved the bank Australian \$70,000 in 1989 terms.
- *Wall et al. (1992)*. In an interrupted, time-series design, these researchers showed that, when production line operators were given greater control in rectifying common (and frequent) operational faults, they significantly increased production line uptime over the following eight months. The impact of job control on the increase in system uptime was of a medium magnitude; however, during the first 2 months following the increase in operator control, the increase in uptime translated into a productivity gain of US\$2,400 per week (1992 prices), and an additional \$1,494 per week in the final weeks of the 8 month post-intervention assessment phase. Wall et al. noted that these financial benefits were "considerable" (p. 361).

These four studies demonstrate that even small and medium *statistical* effects can translate into meaningful financial savings. Indeed, they show that such effects are important to organisations, in terms of cost savings and absence reductions. As a result, we believe that one can conclude that, at least for job control, small-to-medium sized effects on business outcomes are important, and they have been convincingly demonstrated in four rigorously designed interventions studies. It appears, then, that there is a relatively strong research literature, comprising different, rigorous methodologies, that consistently shows that higher levels of control produce better business outcomes.

3.2 SUPPORT

The HSE define support as the encouragement, sponsorship, and resources provided by the organisation, line management, and colleagues.

As for control, there is clear, albeit less, evidence that higher levels of support positively affect business outcomes. Specifically, a longitudinal study by Patterson, Warr, and West (2004) found that supervisory support, and organisational concern for employee welfare, led to better employee productivity in 42 UK manufacturing companies, to a significant and fairly large extent. In contrast, Tharenou (1993) found, in a sample of Australian (male) electrical apprentices, that a supportive supervisory style was not a significant long-term predictor of objective performance (apprenticeship exam grades) or supervisor performance ratings. Nevertheless, as summarised in Table 3.2 (overleaf), there was still an overall, significant and almost large sized effect for the impact of support on objectively measured performance/organisational productivity. The study by Tharenou (1993) did find that supervisory support was significantly related to reduced absenteeism amongst apprentices, one year on, to a significant and small extent. This link between workplace support and absenteeism is consistent with the results of some of the prospective cohort studies mentioned in section 3.1. Specifically, four of these longitudinal studies found that low levels of workplace support were subsequently associated with increased sickness absence rates in various occupational groups (particularly for male workers) (e.g., Melchior et al., 2003; Niedhammer et al., 1998; North et al., 1996; Vahtera et al., 2000).

Table 3.2 Meta-analyses of the relationships between higher levels of support and various business outcomes

<i>Business outcome</i>	<i>Number of studies</i>	<i>Effect size</i>	<i>95% Confidence interval</i>	<i>Size and significance of effect</i>
Objective performance	2	.48	.46 – .50	Fairly large and significant
Performance ratings	1	.10	Not interpretable	Not significant
Absenteeism	1	-.16	-.24 – -.09	Small and significant
Turnover intention	3	-.20	-.26 – -.15	Small-to-medium and significant

Consistent with the results of Patterson et al. (2004), an extensive literature review by Rhoades and Eisenberger (2003) reported a significant, but small, association between greater perceptions of organisational support and increased performance (as measured objectively, and by supervisor ratings). This finding was based on twenty, largely cross-sectional, studies. Other research has also found cross-sectional links between support and objective performance, in particular, using a wide range of objectively measured performance indicators, including number of speeding citations given by US police (Armeli et al., 1998), work output in South African insurance companies (Ballantine & Nunns, 1998), number of traffic summonses issued in a US city (Baruch-Feldman & Schwartz, 2002), and number of selling demonstrations given by door-to-door book sellers in the US (Beehr et al., 2000). The consistency of these cross-sectional findings underlines the potential importance to business of providing support to employees. In addition, knowing that these largely cross-sectional relationships exist between support and objective (and to a degree, subjective) performance justifies additional longitudinal

Note. Longitudinal findings from additional studies, and meta-analyses, indicate that increased support improves each of these four business outcomes, but these results are presented in such a way that they cannot be calculated in this meta-analysis. Some of these key findings are, however, discussed in this section.

research that can explore further the extent to which the former affects the latter, across different industries.

With regards to turnover, there are three longitudinal studies, described in two articles, that reveal that greater support makes people feel less inclined to leave their job. The first study, by Brough and Frame (2004), showed that supervisor support, in particular, was strongly related to lower turnover intention amongst New Zealand police officers at two measurement time points (4 months apart). The second and third studies were conducted by Houkes et al. (2003), and they showed that workplace support, broadly defined, longitudinally predicted lower levels of turnover intention amongst Dutch bankers but not vocational training teachers. Clearly, more than three longitudinal studies are needed, in order to conclude confidently that greater levels of support significantly reduce people's desire to leave their job; nevertheless, the overall findings from these studies indicate that this may be the case. This conclusion is supported by the findings of a recent meta-analytic review, which reported an average correlation of $-.45$ between perceived organisational support and turnover intention, based on a review of 14 (mostly cross-sectional) studies (Rhoades & Eisenberger, 2002).

In summary, then, there is clear evidence that higher levels of support lead to better business outcomes, particularly for objectively measured performance. However, the number of studies that have examined such relationships, and the consistency of their findings, make the business case for support, whilst good, not as strong as it is for control.

3.3 RELATIONSHIPS

The HSE maintain that work relationships are less likely to lead to stress if organisations promote positive working that reduces interpersonal conflict, and have policies and procedures to prevent and resolve unacceptable behaviour (e.g., bullying, sexual harassment, abuses of power).

Difficult work relationships represent a damaging source of stress to which employees can be exposed. For example, workplace bullying has been linked to employee anxiety and depression, with extreme cases resulting in posttraumatic stress disorder (PTSD) (e.g., Hoel, Rayner, & Cooper, 1999). It has even been suggested that workplace bullying may account for a significant number of suicides (Leymann, 1992). Thus, although we focus, here, on the link between relationships at work and *business* outcomes, we do not wish to underestimate the considerable distress caused to employees by the undesirable interpersonal behaviours, discussed below.

Research has investigated various aspects of problematic work relationships, including sexual harassment, bullying, interpersonal conflict within teams, and abusive supervisory behaviours. Although there are differences in definition between these phenomena, all are likely to involve a person being subjected to persistent (and often subtle) harassment, which may include public humiliation, offensive or derogatory remarks, insulting teasing, excessive criticism, badgering, social isolation, and even having work sabotaged. The perpetrators of these behaviours are usually (but not always) in a superior position to the target, within the organisation (e.g., Einarsen, 2000; O'Connell & Korabik, 2000).

From reviewing research linking these forms of harassment to business outcomes, it became clear that this literature sometimes grouped such outcomes in a manner that was distinct from the categorisation used for the other five Management Standards. Specifically, many relationship studies (particularly in the sexual harassment literature) looked at the link between difficult work relationships and employee 'withdrawal behaviours'. This is an umbrella term that covers a number of productivity-related outcomes including absenteeism, tardiness, neglecting work tasks, producing poor quality work, and intentions to quit.

Although we found a great deal of cross-sectional research that investigates the link between work relationships and business outcomes, we were only able to locate three longitudinal studies that did so (i.e., Glomb et al., 1999; Kivimäki et al., 2000; Tepper et al., 2001). We shall now consider each of these, in turn, as well as a recent meta-analysis of this literature that examined both cross-sectional and longitudinal studies (De Dreu & Weingart, 2003).

Glomb et al. (1999) studied female employees of a US university, in order to assess their experiences of sexual harassment at work. In an initial survey, 64% of respondents reported experiencing sexual harassment, reducing to 49% in a second survey two years later. They found that those employees who experienced a higher frequency of sexual harassment (including gender harassment, unwanted sexual attention, and sexual coercion) reported increased work withdrawal (e.g., absenteeism, tardiness, escaping from work tasks). Glomb et al.'s longitudinal analysis suggested that sexual harassment significantly reduced well-being and job satisfaction two years on, which in turn led to increased work withdrawal and turnover intention. These results speak to the long-term, adverse impact that sexual harassment in the workplace has on people.

Tepper et al. (2001) investigated the longitudinal relationship between abusive supervision and employees' work withdrawal behaviours (which included pretending not to know about work tasks, ignoring the supervisor, and making a half-hearted effort). As can be seen in Table 3.3 (overleaf), these researchers found a significant, and small-to-medium, relationship between

abusive supervisory behaviours (e.g., telling an employee they are incompetent, reminding an employee of past mistakes) and increased work withdrawal, six months later.

Table 3.3 Meta-analyses of the correlations between poor work relationships and various business outcomes

<i>Business outcome</i>	<i>Number of studies</i>	<i>Effect size</i>	<i>95% Confidence interval</i>	<i>Size and significance of effect</i>
Withdrawal behaviours	2 ¹	.23	Not interpretable	Small-to-medium and significant
Team performance	24 ²	-.22	-.25 – -.19	Small-to-medium and significant
Absenteeism	1 ³			
Turnover intention	1 ³			

In a large prospective cohort study, Kivimäki et al. (2000) assessed the impact of workplace bullying on subsequent absenteeism, amongst Finnish hospital employees. These researchers obtained information on employees' sickness absences from organisational records over a two year follow-up period. Those employees who reported that they had been the targets of workplace bullying took 51% more longer-term absences (≥ 4 days), and 23% more shorter absences (≤ 3 days) than their non-bullied colleagues. These associations between bullying and increased sickness absence were independent of age, gender, job contract, or income. Interestingly, there was also some evidence that *non*-bullied employees, working in units where bullying occurred, had higher levels of absenteeism than those working in units where bullying did not occur.

De Dreu and Weingart (2003) conducted a useful meta-analysis of the link between relationship conflict within teams and various indicators of team performance. Relationship conflict refers to the amount of friction existing within a work group, and this can be caused by differences in personal taste, values, and interpersonal style. Based on their review of 24 relevant cross-sectional and longitudinal studies, De Dreu and Weingart calculated an average conflict-performance correlation of -.22, which indicates that greater relationship conflict is generally associated with reduced team performance. Importantly, these researchers made a point of including only the most objective performance indicators, where these were available.

In sum, these four well-designed studies (three of which were strictly longitudinal) suggest that problematic relationships at work can lead to worse work withdrawal behaviours, absenteeism, turnover intention and team performance. Although longitudinal research assessing the link between relationships and business outcomes is rare, the results from these types of studies (reported above) are generally consistent with the cross-sectional research that has been conducted in this area. In particular, our own trawl through the cross-sectional findings suggests that the average association between various forms of employee harassment and business outcomes is, as with the longitudinal results presented above, small-to-medium in magnitude.

As discussed in section 3.1.3, it is important not to underestimate the economic impact of a small-to-medium statistical effect. For example, Leymann (1990) estimated that each employee subjected to bullying at work costs an organisation approximately US\$30,000 - \$100,000 per

¹ Note. ¹Results from one of these studies are presented in such a way that they cannot be included in the meta-analysis, but they are discussed, above. ²These come from the meta-analysis by De Dreu and Weingart, and their results are discussed, above. ³These results are presented in such a way that they cannot be included in the meta-analysis, but they are discussed, above.

year (1990 prices). Likewise, Hoel et al. (2001) estimate that some 27 million working days are lost each year in the UK due to bullying, at a total cost to UK organisations of £1.88 billion, even when excluding costs due to lost productivity and use of grievance procedures.

3.4 ROLE

According to the HSE, this source of stress addresses the degree to which people understand, or are clear about, their role within the organisation, and whether the organisation ensures that people do not have conflicting roles.

In reviewing a business case for the Role standard, we first considered Tubre and Collins' (2000) comprehensive meta-analysis of the relationships between role problems (i.e., ambiguity/lack of clarity, role conflict) and job performance. These researchers reviewed a number of cross-sectional and longitudinal studies; in doing so, they found that role ambiguity was not statistically associated with objectively measured performance, averaged across 12 correlations. Similarly, they found that role conflict was not statistically correlated with objectively measured performance, averaged across 7 correlations. Furthermore, Tubre and Collins showed that the average of 34 correlations, between role ambiguity and supervisor/peer-ratings of performance, was not significant. However, greater role ambiguity was significantly related to worse self-ratings of performance, to a small-to-medium extent ($r = -.21$ (self-ratings) and $-.14$ (supervisor/peer ratings)). Consistent with these latter findings, a subsequent study by Jimmieson et al. (2004), conducted in an Australian state government department, found that role clarity predicted, up to two years later, better self-reported client engagement, to a small-to-medium extent.

We found no longitudinal studies that examined the relationship between role features and absenteeism. However, we did find one study that assessed the extent to which role features relate to work withdrawal behaviours. Kammeyer-Mueller and Wanberg (2003) found that better role clarity predicted, to a small-to-medium extent, less work-withdrawal behaviours, over a four month time period. (Here, work-withdrawal behaviours referred to self-reported actions such as failing to attend scheduled meetings, and making excuses to get out of work.) Clearly, considerably more research is required in order to determine whether this relationship generalises to different types of organisations. Promisingly, though, Kammeyer-Mueller and Wanberg (2003) conducted their study across several different types of US organisations (e.g., manufacturing, food distribution, healthcare, and education), thus suggesting some generalisability for this finding.

We obtained three studies that investigated the impact of role features on turnover intention. In a longitudinal study of manufacturing workers, Moore et al. (2004) found that greater role clarity was significantly associated with less turnover intention (as measured at the same time points) (-0.39 ; 95% confidence interval: $0.34 - 0.43$). Similarly, Wanberg and Kammeyer-Mueller (2000) found an almost identical correlation (-0.33) between greater role clarity and lower turnover intention, amongst previously unemployed individuals who had found new employment, and who had been in post for approximately three months. However, these researchers found that role clarity did not predict actual turnover, across a one year period. The third study (Major et al., 1995) surveyed US management and engineering graduates as they first entered the job market. These authors calculated the differences between conflict and clarity expectations before the graduates entered their employing organisation, and the actual levels of conflict and clarity that the graduates experienced, during the first four weeks of their new jobs. Results indicated no significant relationships between unmet role expectations, in terms of conflict and clarity, and turnover intention. Perhaps, this is not too surprising, given that it might take some time for the impact of disappointingly defined roles to affect adversely people's desire to leave their job, especially when it is their first post-university job. Nevertheless, as can be seen in Table 3.4 (overleaf), even when this non-significant finding for graduates is aggregated with the studies by Moore et al. (2004) and Wanberg and Kammeyer-Mueller (2000), there is still a significant and medium effect size for the impact of role features on turnover intention.

In conclusion, there is a limited amount of longitudinal research investigating the impact of role features on business outcomes. Importantly, though, this small body of research has examined a diverse range of participants (e.g., Australians, Americans, public and private sector workers, engineers and manufacturing workers) using very different measures of business outcomes (e.g., objective performance measures, work-withdrawal behaviours, performance ratings, and turnover intention), and it has consistently shown that role features impact upon at least self-reported performance, withdrawal behaviours, and turnover intention. In contrast, a previous meta-analysis found no support, amongst both longitudinal and cross-sectional studies, for the hypothesis that role problems affect objective measures of performance, as well as performance ratings made by supervisors or work colleagues. Furthermore, we could not identify any study that investigated the impact of role conflict or ambiguity on absenteeism. Based upon the extant research, then, role problems seem to have their greatest impact on turnover intention and how people perceive they perform their job, but not on how other people perceive they do their job; nor do such problems appear to impact people's performance, as measured by objective outcomes.

Table 3.4 Meta-analyses of the relationships between well designed job roles and various business outcomes

<i>Business outcome</i>	<i>Number of studies</i>	<i>Effect size</i>	<i>95% Confidence interval</i>	<i>Size and significance of effect</i>
Self-rated performance	1	.26 ¹	Not interpretable	Small-to-medium and significant
Work withdrawal	1	-.26	Not interpretable	Small-to-medium and significant
Turnover intention	3 ²	-.29	-.33 – -.25	Medium and significant

¹ Note. See above text for details concerning the relationship between job roles and performance. ¹A meta-analysis by Tubre and Collins (2000) showed a similar effect for self-rated performance, but, for statistical reasons, it cannot be included in this meta-analysis. It is discussed, though, in this section. ²The effect size of one of these longitudinal studies is based on a cross-sectional correlation, as discussed in this section.

3.5 DEMANDS

The HSE define demands as aspects of work to which people have to respond, such as work load, work patterns, and the work environment.

The relationship between demands and business outcomes has been studied in both laboratory and work settings, and we shall discuss the findings from both types of research, in this section. To begin with, as can be seen in Table 3.5, laboratory experiments indicate that higher levels of demands lead to lower levels of objectively measured performance, to a significant and small-to-medium degree (e.g., Jimmieson & Terry, 1997; Parkes et al., 1990; Searle et al., 2001). For example, Jimmieson and Terry (1997) found that Australian university students in a high demand condition (i.e., increased time pressure) completed fewer in-basket items than those in a low demand condition. Likewise, Parkes et al. (1990) found that UK university students achieved significantly higher levels of accuracy in a letter sorting task, when they were performing the task under less demanding (i.e., slower paced) conditions. Similarly, Parkes (1995) manipulated the work schedules of UK driving test examiners, in order to evaluate the effects of workload reduction on alertness. Importantly, though, alertness was not measured when the instructors were performing their actual job; instead, it was assessed by a search and memory task that was not part of their actual job. That is, an analogue (or laboratory-type) task was used as the performance outcome. Nevertheless, Parkes (1995) found that reducing examiners' workload gave rise to greater alertness (i.e., better cognitive performance) over the working day.

Consistent with these results for objectively measured performance, two studies, again conducted in laboratories, found that higher demand levels led to lower performance ratings; and, the magnitude of these impacts was medium in size (see Table 3.5, overleaf). One of the studies that demonstrated this effect was conducted by Jimmieson and Terry (1997), noted in the previous paragraph. The second was by Searle et al. (2001). They found that university students rated themselves as performing more accurately on a simulated mail sorting task in a laboratory, when their workload was less demanding.

Whilst all of these findings from laboratory (or analogue)-based research are very consistent in showing the detrimental impact of demands on performance, they may have limited relevance to real world organisations, for reasons discussed below.

Table 3.5 Meta-analyses of the relationships between higher levels of demands and various business outcomes

<i>Business outcome</i>	<i>Number of studies</i>	<i>Effect size</i>	<i>Confidence interval</i>	<i>Size and significance of effect</i>
Objective performance	4	-.22	-.16 - .28	Small-to-medium and significant
Performance ratings	2	-.34	-.23 – -.45	Medium and significant
Absenteeism*				Not significant
Turnover intention	3	.02	-.03 – .08	Not significant

The demands findings that can best inform a business case come from longitudinal studies that were conducted outside of laboratories, in real organisations. There are a number of these 'real

Note. * Findings from these studies cannot be adequately summarised in a meta-analysis, due to the varied nature of the statistics that are reported. They are discussed in this section

world' studies, and they examined the impact of psychosocial demands on absenteeism or turnover. A number of large prospective cohort studies assessed the link between demands and subsequent absenteeism in various occupational groups in Finland (e.g., Kivimäki et al., 2001; 2003; Vahtera et al., 1996; 2000), France (e.g., Melchior et al., 2003; Niedhammer et al., 1998), Holland (e.g., Smulders & Nijhuis, 1999), and the UK (e.g., North et al., 1996). An overview of the findings from these well-designed studies suggests that work demands are inconsistently related to absenteeism, and that the strength (and even the direction) of this relationship depends on the level of control that employees have over their jobs. For example, in the Whitehall II study of over 9000 British civil servants, North et al. (1996) found that (self-reported) work demands were not significantly related to absenteeism, in the form of a main, or independent, effect (when controlling for age and job grade). However, greater demand levels resulted in higher absence levels for male employees who also had *low levels of control*. This toxic combination resulted in 10% to 20% higher levels of sickness absence. The general conclusion that can be drawn from these cohort studies is that high demands are not a good predictor of absenteeism, except when they are accompanied by lower levels of control (which are typically seen in lower grade jobs).

Three longitudinal studies examined the impact of demands on turnover intention or actual turnover. In two studies conducted in the Netherlands, Houkes et al. (2003) found that, for teachers, higher levels of demands led to greater turnover intention, but to a very small degree; no such significant relationship was found for a sample of bankers. Similarly, de Croon et al. (2004) found a very small, but nonetheless statistically significant, relationship between high demands and subsequent turnover amongst a large group of Dutch truck drivers. As can be seen in Table 3.5, the findings of these three studies combine to produce an overall, non-significant effect on turnover.

As indicated above, the inconsistent effects that demands have on absenteeism and turnover, in real organisations, may result from the moderating impact that other working conditions, particularly control, have on demands. Indeed, Karasek's (1979) well known model of work stress essentially maintains that the impact of demands will vary considerably depending upon whether people have control over how they face those demands. (An hypothesis that is consistent with the Whitehall II findings described, above.) In particular, even relatively high levels of demands are proposed to have beneficial effects for people, if they have higher levels of control. In contrast, if they have lower levels of control, relatively high demands are thought to have very detrimental results that range from mental ill-health to cardiovascular disease. Thus, when trying to establish the impact of demands on business outcomes, in real organisations (i.e., outside of a laboratory), it may be necessary to account for other work design characteristics (e.g., high levels of control) that might buffer any deleterious effects that demands have on business outcomes and, indeed, stress.

Not only may the impact of demands be moderated by at least one work design variable (i.e., control), but demands, themselves, often result from poorly managed and designed work. For example, role overload and ambiguity would serve to increase people's workload and time pressure (or 'demands'), as would a lack of support in carrying out one's work. In these cases, solutions to heavy work demands are more effectively identified and implemented by addressing these specific work design characteristics, rather than by conceptualising them as 'demands'.

This view of demands as an overly broad concept, whose effects are in any event moderated by control, may explain the range of findings just discussed for this work condition. Specifically, it may account for why demands only have meaningful and consistent effects on business outcomes in laboratory experiments: it is simply too difficult to isolate and assess the impact of 'demands' in the real work environment; in the laboratory, though, researchers can assess

workload and time pressure, free from the confounds inherent in 'real world' management and work design (e.g., job control, support, and problems with one's role). However, it is these real world 'confounds' (e.g., higher levels of control, support, and non-conflicting roles) that may offset, or negate, the fairly serious, deleterious performance effects that are caused by demands, at least in the laboratory.

In conclusion, further longitudinal research, conducted within actual organisations, is required before we can establish how and when demands affect business outcomes. Importantly, this research needs to specify clearly what constitutes a demand, as against another poorly designed work condition (e.g., conflicting roles). In addition, it must consider (or account for) variables (e.g., control) that may buffer the potentially detrimental effects that demands have on performance, at least in the laboratory.

3.6 CHANGE

The HSE maintain that large or small organisational change is unlikely to lead to high levels of stress, if this change is communicated to employees in an useful manner, and if the change process is managed effectively (e.g., if training is provided where necessary, and if employees have participation in change proposals).

Making small and large organisational changes, whilst necessary to remain competitive, nevertheless involve transforming, modifying, or altering work design, technology, and/or training and development prospects: a change to any of which might contravene a worker's *psychological contract*, or what people believe are the, probably unspoken but 'understood', terms and conditions under which they work (Robinson & Rousseau, 1994). For example, instituting some type of team working might violate the psychological contract of people who feel that they did not 'sign up for that' when they accepted their job. Such a violation can often make people want to leave their organisation, or at least put less effort into performing their work (Arnold, 2005). Given these potentially serious repercussions of implementing needed changes, it is perhaps surprising that we found only four longitudinal studies that investigated how business outcomes are affected by successfully communicating and managing this process.

One study, conducted by Schweiger and Denisi (1991), was a quasi-experiment across two plants of a US manufacturing company that was in the process of merging with another similar firm. Its general aims were: (1) to assess the impact of such a merger on employee-related outcomes (e.g., job uncertainty) and business-related ones (i.e., turnover intention, performance, and absenteeism); and, (2) to evaluate the effectiveness of a change communication programme for reducing the detrimental impact of the merger. To investigate these issues, Schweiger and Denisi implemented a change communication programme in only one of the manufacturing plants; the programme was designed to provide employees with specific information about how the merger would affect them in terms of layoffs, promotions, changes in pay etc. In this plant, two-way communication between management and employees was facilitated by the introduction of a newsletter, by regular (weekly) departmental meetings, and by a telephone hotline answered by a personnel manager. In the comparison plant, information regarding the merger was conveyed to employees in the same way that previous organisational changes had been communicated (essentially by letter from the CEO).

Schweiger and Denisi (1991) found that, in the three months following the implementation of this communication programme, employees involved in the programme reported significant increases in self-rated performance (which had dropped following announcement of the merger), and significant reductions in absenteeism. It was interesting to note that by the end of this study, self-rated performance in the plant that implemented the communication intervention had begun to return to pre-merger levels.

The importance of effective communication during organisational change was investigated in two further longitudinal studies by Kernan and Hanges (2002) and Johnson et al. (1996). Kernan and Hanges surveyed employees working in the UK and US research and development units of a large multinational pharmaceutical company. During the months prior to the study, this division of the company had been through a major reorganisation, which had resulted in significant changes to its departmental structure. Kernan and Hanges found that employees reported less turnover intention, when they perceived the information, received during the reorganisation, as timely, accurate, and adequate. Additionally, the more input that employees felt they had in the reorganisation, the more likely they were to perceive the change process as fair, and these perceptions of fairness were, in turn, related to lower turnover intention 10 months later.

Similarly, Johnson et al. (1996) conducted a study within a US insurance company that had recently implemented two major workforce reduction programmes, twenty days apart. Like the two studies reported above, these researchers investigated the impact of difficult organisational change on employees who kept their jobs during the reduction (the ‘survivors’). In particular, this research focused on the importance of effective communication, during the change process, for reducing survivors’ propensity to turnover. Not surprisingly, employees in this study reported a significant increase in turnover intention, in the days following the initial workforce reduction (which reduced their division’s workforce by more than 8%). However, the results of this study also suggested that effective and supportive communication from managers in the days after the workforce reduction predicted less turnover intention. The findings of this study, in conjunction with those of Kernan and Hanges (2002), imply that, immediately after a workforce reduction, managers need to ensure that they effectively communicate work-related information to continuing employees, in order to decrease turnover intention.

Thus, there is limited, but high quality and consistent longitudinal evidence that detailed and accurate communication regarding change processes help to stabilise performance ratings, and reduce absenteeism and turnover intention, at least in the private sector. There is no reason to believe, however, that this same finding would not also apply to the public sector.

In addition to Schweiger and Denisi’s (1991) article (summarised above), we found another longitudinal study that evaluated the impact of effective change management on self-rated performance. In this study, Jimmieson et al. (2004) surveyed state government employees in Australia, who were undergoing a significant change in organisational structure and strategic direction (brought about by a change in government, and an independent review). In contrast to Schweiger and Denisi’s results, Jimmieson et al. found that the provision of change-related information was not a significant longitudinal predictor of one indicator of self-rated performance: client engagement (when measured 2 years later). Nevertheless, across these two studies, effective change management still had a significant, if small, effect on turnover intention.

As summarised in Table 3.6 (overleaf), there is a small, but promising, evidence base that suggests that detailed and accurate communication about organisational change processes reduce turnover intention. There is also one study that links such detailed and accurate communication to better performance ratings and lower absence levels. We found no studies that tested for a correlation between effective change management and objective measures of performance or supervisor/peer measures. More research is clearly needed to confirm and further explore these relationships.

Table 3.6 Meta-analyses of the relationships between effectively communicating and managing change and various business outcomes

<i>Business outcome</i>	<i>Number of studies</i>	<i>Effect size</i>	<i>95% Confidence interval</i>	<i>Size and significance of effect</i>
Objective performance	None			
Self- ratings of performance	2	.11	.01 – .22	Small and significant
Absenteeism	1	-.23		Small-to-medium and significant
Turnover intention	2*	-.28	-.16 – -.40	Nearly medium and significant

Note. *These studies are cross-sectional.

4. DISCUSSION

Establishing a business case for the Management Standards is extremely important for theoretical and policy reasons, but it is also crucial for practical purposes. In particular, establishing a clear business case is very likely to increase the probability that organisations will implement and maintain these desirable working conditions. It would be good to think that the generally acknowledged impact that these conditions have on stress (e.g., Cox, 1993) would be sufficient to convince organisations to adopt the Management Standards, but such a view is likely to be naïve, in many instances. The target culture that currently pervades the UK public sector (Ahmad & Broussine, 2003), and the profit culture that is at the heart of many companies in the private sector mean that issues that are seen as immaterial to, or indeed that stymie, these primary aims are likely to receive little attention by organisations. In working with many public and private sector organisations, we have encountered a widespread belief that reducing work-related sources of stress is one such business irrelevant issue. Thus, research that shows specific working conditions as impacting both stress and productivity would provide organisations with a positive incentive to adopt management practices, such as those advocated by the Management Standards. Negative incentives, such as legal threats, tend to produce bare minimum fulfilment of regulations, are more expensive to administer, promote ill-will and are, therefore, less desirable strategies for obtaining compliance of any type (Catania, 1998; Daniels, 2000). It is important, therefore, to establish a business case for the Management Standards.

The results of these meta-analyses and literature review lead to the conclusion that there is a business case for the Management Standards. Without doubt, the case is stronger for some working conditions, but there is at least some high quality evidence for a business case for each stressor area. Specifically, addressing the first objective of this study, the existing literature indicates that these six working conditions determine the business outcomes detailed in Table 4 (overleaf):

Table 4 Working conditions and their impact on business outcomes

Greater control	<i>Leads to</i> →	Better performance, objectively measured Better performance ratings Less absenteeism Less turnover intention
Better support	<i>Leads to</i> →	Better performance, objectively measured Better performance ratings Less absenteeism Less turnover intention
Better work relationships	<i>Lead to</i> →	Less withdrawal behaviours Better team performance Less absenteeism Less turnover intention
Well-designed roles	<i>Lead to</i> →	Less work withdrawal Better self-rated performance Less turnover intention
Greater demands	<i>Lead to</i> →	Better performance, objectively measured (<i>in lab studies</i>) Better performance ratings (<i>in lab studies</i>) Less absenteeism (<i>when demands are accompanied by low levels of control</i>)
More effective change management and communication	<i>Lead to</i> →	Better performance ratings Less absenteeism Less turnover intention

These findings constitute fairly convincing evidence that, overall, the working conditions specified in the Management Standards impact business outcomes, however, the depth and breadth of this evidence varied for each standard, as we will now discuss.

Without doubt, the most convincing evidence for a business case was seen for control. Nineteen longitudinal studies or laboratory experiments investigated the impact that this working condition has on objective performance, performance ratings, absenteeism, or turnover intention, with eight of these studies showing a small-to-moderate statistical impact on objectively measured performance. The best evidence, however, for meaningful effects of control on business outcomes stems from intervention studies.

For the purposes of this report, we reviewed intervention studies that examined the business impacts that result from improving one or more working conditions. Such studies, if designed properly, allow researchers to conclude with the greatest certainty possible, that it is really the improvement of a working condition (e.g., control) that enhances a business outcome (e.g., performance). In addition, such intervention studies can show how feasible it is to redesign working conditions, so that business outcomes are meaningfully improved. As can be seen from the Results section (Section 3 of this report), every relevant intervention study that we found examined the impact of enhancing control on one-or-more business outcomes. Specifically, addressing the second objective of this research report, we found that four out of five rigorous

studies clearly demonstrated that increasing job control paid off considerably in terms of improving absenteeism, turnover, or performance (objectively measured and as rated by others).

These intervention studies made relatively low-impact changes, similar in scope to what we would expect from the focus group/consultative method that the Management Standards advocate. This similarity augurs well for the success of the Management Standards approach, in terms of improving business outcomes. In that, the relatively low-impact changes produced in these studies, which were designed to increase people's control, saved organisations:

- £105,164 in short-term absence costs over a one year period in two UK financial call centres (Bond et al., submitted).
- £43,000 in turnover costs over a six month period in an Australian bank (McFadden & Demetriou, 1993).
- £1500-£2000 *per week* in system downtime over an eight month period in a UK manufacturing organisation (Wall et al., 1992).

Thus, addressing the third objective of this research report, there is robust, UK-based evidence, albeit very limited, that organisations can make significant financial savings, when improving at least one of the six working conditions specified in the Management Standards: job control. Research now needs to explore the degree to which interventions can affect business outcomes by improving the other five working conditions.

There is clear evidence that higher levels of support lead to better business outcomes, particularly for objectively measured performance. However, the number of studies that have examined such relationships, and the consistency of their findings, make the business case for support, whilst good, not as strong as it is for control.

Relationship problems appear to have their greatest effect by reducing team performance and increasing withdrawal behaviours. In contrast, role problems seem to have their greatest impact by increasing turnover intention and undermining how people perceive they perform their job, but not on how other people perceive they do their job; nor do such problems appear to impact people's performance, as measured by objective outcomes.

There is a small, but promising, evidence base that suggests that detailed and accurate communication about organisational change processes reduce turnover intention. There is also one study that links such detailed and accurate communication to better performance ratings and lower absence levels.

The business case appears weakest for demands. To try to bolster it, future studies need to assess the impact of this working condition, in conjunction with others. To elaborate, the results of this report showed that demands only had a meaningful impact on business outcomes, in laboratory experiments; in this rarefied context, it was clear that high levels of demands led to important decrements in performance (whether rated by others or objectively assessed). In longitudinal studies conducted in real organisations, high demands only produced greater absenteeism (in any consistent way) when workers also had lower levels of control. The reason for this discrepancy between laboratory and 'real world' findings may be that, in actual working environments, the deleterious effects of demands on business outcomes, seen in the laboratory, may be offset through good management and work design (particularly higher levels of job control). This hypothesis of a moderating effect for job control is certainly consistent with dominant theories of demands and occupational health and performance (e.g., Karasek, 1979; Siegrist, 1996). The implication of this hypothesis is that future research needs to account for control, and perhaps other working conditions (e.g., support), when assessing the effects that high demands have on business outcomes.

In addition, field studies assessing the impacts of demands (as they interact with control) would do well to broaden the range of business outcomes that they examine. To date, these studies have looked at how demands affect absenteeism and turnover, and we could only find laboratory experiments that examined the impact of demands on performance; field studies that also incorporate performance outcomes are very much needed.

5. IMPLICATIONS AND RECOMMENDATIONS

5.1 THE NEED FOR MORE QUASI-EXPERIMENTAL OUTCOME STUDIES

No researcher would fail to recommend that more longitudinal studies are needed to investigate relationships between the six sources of stress and business outcomes; however, for the purposes of validating and promoting the Management Standards for stress, what is more useful would be quasi-experimental outcome studies that investigate the business and health impacts of interventions that improve working conditions in all six of the Management Standards, using the associated risk assessment process.

The Management Standards for stress initiative advocates an approach to reducing stress through minimising stressors. Knowing that these stressors have an impact on health and business outcomes is an important first step in validating and promoting this approach, but it is just that: a first step. More importantly, it is necessary to show that the Management Standards process, which is a low-impact and very participative approach (involving the Indicator Tool and employee consultation), actually produces the desired results. As we noted in this report, there are five quasi-experimental outcome studies that have investigated the effect of a low impact approach on both health and business outcomes (i.e., Bond & Bunce, 2001; Bond et al., submitted; Griffin, 1991; Schweiger and Denisi, 1991; Landsbergis & Vivona-Vaughan, 1995). Only three of these, though, have investigated the impact of a low impact *and* participative approach on business outcomes² (i.e., Bond & Bunce, 2001; Bond et al., submitted; & Landsbergis & Vivona-Vaughan, 1995). Results from these studies suggest that the Management Standards approach to stress is likely to be effective, but it is important to test the Management Standards approach prospectively, as it differs somewhat from the change process that was examined in these studies.

5.2 THE MANAGEMENT STANDARDS APPROACH MAY LEAD ORGANISATIONS TO REDUCE SEVERAL STRESSORS AT ONCE: WILL THIS WORK AND, IF SO, HOW?

Previous quasi-experimental outcome studies have focused on reducing just one source of stress (i.e., lack of control or poor communication of change). Organisations that use the Management Standards approach, though, may end up needing to improve two-or-more working conditions; however, research cannot comment upon the degree to which a single participative intervention (i.e., one focus group) can do this effectively. Is it best to focus on improving one Standard at a time? If so, which one is most important, or easiest, to improve? That is, does actually improving control, for example, have a greater impact on performance and mental health than does increasing workplace support? In addition, is it easier for most interventions to alter some working conditions (e.g., control and roles) than others (demands and relationships)? If this type of variability does exist, such information would be very valuable for organisations that adopt the Management Standards approach to stress management. As a result, research is needed to answer these practical questions.

On a related point, if an organisation attempts to improve several working conditions at once, does the intervention work, as a direct result of improving each of these conditions, or does it work primarily because it actually improves just one? This question is not just a theoretical one: It has very important practical implications. For example, if outcome research shows that interventions that seek to improve roles, support, and control have beneficial impacts primarily

² Other studies have used a quasi-experimental design to test the impact of a participative approach on just health outcomes, e.g., Griffin, 1991; Jackson, 1983; Wall, et al., 1986.

as a result of having increased control, then the HSE could advise organisations to focus their efforts firstly on ensuring that they increase control. Perhaps, even, to increase people's control over: how they define and clarify their roles; and, how they identify and obtain the support that they need. (Such an approach was successfully used by Bond and Bunce, 2001.)

The point here is that only two quasi-experimental outcome studies have investigated the mediators, or mechanisms, by which working conditions improve health and business outcomes (i.e., Bond & Bunce (2001) and Bond et al. (submitted)); and, these have done so by testing relatively circumscribed interventions (i.e., those focusing only on increasing control). Further outcome and mediator studies are very much required, however, given that the Management Standards advocate such a potentially disparate array of intervention targets (e.g., control *and* support, *and* relationships).

5.3 WHAT TYPE OF RESEARCH PROGRAMME IS NOW NEEDED?

In order to establish the extent to which the Management Standards provide effective guidance for tackling work related stress, it is essential to conduct a formal evaluation of their impacts on mental health and business outcomes. Such an evaluation is not only important for (1) the HSE's internal requirements, it is also necessary in order (2) to convince businesses to adopt them (e.g., by establishing a very convincing business case for the Management Standards), and (3) to persuade academic, professional bodies, advocacy groups, research centres, and practitioners that the Management Standards are a viable and successful means by which to address stress at work. Conducting a formal evaluation that can speak to the various concerns of these three groups constitutes a joined-up, systematic, and cost-effective approach to rigorous monitoring.

Thus, in order to address all of the issues raised in 5.2 and the above paragraph, it is critical to conduct one-or-more longitudinal, quasi-experiments that would involve the following:

1. Identifying one-or-more public- and private-sector organisations that have not already piloted the Management Standards (or who are so big that there are large areas of their business that have not yet done so).
2. Distributing a survey, including the HSE's Indicator Tool, to these organisations, *before* the Management Standards change process begins (i.e., before the steering committee – or other employee consultation initiative – considers work changes). This survey would use reliable and valid measures to assess mental ill-health levels, job satisfaction, depression, anxiety, stress, job motivation, and organisational commitment (and any others deemed necessary). In addition, it would be important, in order convincingly to establish a business case for the Management Standards, to assess productivity outcomes over the previous year that are relevant to the participating organisations. In all likelihood, these would include, absenteeism, turnover, and various measures of performance.
3. Once the survey is conducted, the change process begins in one area of the business, whilst another, comparable area of the same organisation, serves as the control group; that is, an area in which the Management Standards approach is not implemented, and where it is 'business as usual'. This control group would also have participated in the survey described in the previous paragraph.
4. One year after the original survey is conducted, the same survey is again administered. Also, productivity data for the previous year are collected. Through the use of statistical analyses, it is possible to determine the impact that improved working conditions have had on the health and productivity of a participating business. Most importantly,

because a control group is used, it is possible to attribute directly any improvements seen in the 'intervention group' to improvements in one-or-more of the Management Standards. Such attribution is not only important to convince the HSE, politicians, academics, and economists of the usefulness of the Standards, but it is also important in order to persuade organisations that they could benefit from them. In addition, analyses can be conducted that can identify the mechanism, or mediator, by which health and business improvements occurred.

5. Yearly surveys can then be administered for as long as it is desirable to do so.

As can be seen, this formal evaluation approach has the benefits of addressing potential concerns of various stakeholders in one-or-more, rigorous studies. This does not mean, of course, that other types of research on the Management Standards are not also very valuable (e.g., case studies, or those using a Whitehall-type design); but, they cannot replace the evaluative strengths and benefits of using a study, designed in the manner specified here. For only through this method can a business case for the Management Standards be most convincingly made.

6. REFERENCES

- Ahmad, Y., & Broussine, M. (2003). The UK public sector modernization agenda. *Public Management Review*, 5, 45-62.
- Ala-Mursula, L., Vahtera, J., Pentti, J., & Kivimaki, M. (2004). Effect of employee worktime control on health: A prospective cohort study. *Occupational and Environmental Medicine*, 61, 254-261.
- Ariens, G. A. M., Bongers, P. M., Hoogendoorn, W. E., van der Wal, G., & van Mechelen, W. (2002). High physical and psychosocial load at work and sickness absence due to neck pain. *Scandinavian Journal of Work Environment and Health*, 28, 222-231.
- Armeli, S., Eisenberger, R., Fasolo, P., & Lynch, P. (1998). Perceived organizational support and police performance: The moderating influence of socioemotional needs. *Journal of Applied Psychology*, 83, 288-297.
- Ballantine, K., & Nunns, C. G. (1998). The moderating effect of supervisory support on the self-efficacy work-performance relationship. *South African Journal of Psychology*, 28, 164-173.
- Baruch-Feldman, C., Brondolo, E., Ben Dayan, D., & Schwartz, J. (2002). Sources of social support and burnout, job satisfaction, and productivity. *Journal of Occupational Health Psychology*, 7, 84-93.
- Beehr, T. A., Jex, S. M., Stacy, B. A., & Murray, M. A. (2000). Work stressors and coworker support as predictors of individual strain and job performance. *Journal of Organizational Behavior*, 21, 391-405.
- Bond, F. W. (in press). The impact of psychological flexibility and job control on learning, job performance, and mental health. *Journal of Organizational Behavior Management*.
- Bond, F. W., & Bunce, D. (2003). The role of acceptance and job control in mental health, job satisfaction, and work performance. *Journal of Applied Psychology*, 88, 1057-1067.
- Bond, F. W., Bunce, D. (2001). Job control mediates change in a work reorganization intervention for stress reduction. *Journal of Occupational Health Psychology*, 6, 290-302.
- Bond, F. W., Flaxman, P. E., & Bunce, D. (submitted). Mediated moderation of a work reorganization intervention: The effect of an individual characteristic on the success of work redesign.
- Brough, P., & Frame, R. (2004). Predicting police job satisfaction and turnover intentions: The role of social support and police organisational variables. *New Zealand Journal of Psychology*, 33, 8-16.
- Catania, A. C. (1998). *Learning* (4th ed.) Upper Saddle River, NJ: Prentice-Hall.
- Cohen, J. (1977). *Statistical power analysis for the behavioral sciences*. San Diego, CA: Academic Press.
- Cohen, J. (1994). The earth is round ($p < .05$). *American Psychologist*, 49, 997-1003.

- Cox, T. (1993). *Stress research and stress management: Putting theory to work*. Sudbury: HSE Books.
- Cropanzano, R., & Wright, T. A. (2001). When a happy worker is really a productive worker. A review and further refinement of the happy-productive worker thesis. *Consulting Psychology Journal: Practice & Research*, 53, 182-199.
- Daniels, A. C. (2000). *Bringing out the best in people*. New York, NY: McGraw-Hill.
- Daniels, K., Jones, D., Ferguson, E., Perryman, S., & Rick, J. (2004). *Cognitive factors' influence on the expression and reporting of work-related stress*. Norwich: HSE Books.
- De Croon, E. M., Sluiter, J. K., & Frings-Dresen, M. H. W. (2003). Need for recovery after work predicts sickness absence: A 2-year prospective cohort study in truck drivers. *Journal of Psychosomatic Research*, 55, 331-339.
- De Croon, E. M., Sluiter, J. K., Blonk, R. W. B., Broersen, J. P. J., & Frings-Dresen, M.H.W. (2004). Stressful work, psychological job strain, and turnover: A 2-year prospective cohort study of truck drivers. *Journal of Applied Psychology*, 3, 442-454.
- De Dreu, C. K. W., & Weingart, L. R. (2003). Task versus relationship conflict, team performance, and team member satisfaction: A meta-analysis. *Journal of Applied Psychology*, 88, 741-749.
- Dodd, N. G., & Ganster, D. C. (1996). The interactive effects of variety, autonomy, and feedback on attitudes and performance. *Journal of Organizational Behavior*, 17, 329-347.
- Durlak, J. A. (1995). Understanding meta-analysis. In L. G. Grimm, & P. R. Arnold (Eds.). *Reading and understanding multivariate statistics*. Washington, DC: American Psychological Association.
- Einarsen, S. (2000). Harassment and bullying at work: A review of the Scandinavian approach. *Aggression and Violent Behavior*, 5, 379-401.
- Glomb, T. M., Munson, L. J., Hulin, C. L., Bergman, M. E., & Drasgow, F. (1999). Structural equation models of sexual harassment: Longitudinal explorations and cross-sectional generalizations. *Journal of Applied Psychology*, 84, 14-28.
- Greenberger, D. B., Strasser, S., Cummings, L. L., & Dunham, R. B. (1989). The impact of personal control on performance and satisfaction. *Organizational Behavior and Human Decision Processes*, 43, 29-51.
- Griffin, R. W. (1991). Effects of work redesign on employee perceptions, attitudes, and behaviors: A long-term investigation. *Academy of Management Journal*, 34, 425-435.
- Hoel, H., Rayner, C., & Cooper, C. L. (1999). Workplace bullying. In C. L. Cooper & I. T. Robertson (Eds.), *International Review of Industrial and Organizational Psychology* (Volume 14). Chichester: Wiley.
- Hoel, H., Sparks, K., & Cooper, C. L. (2001). *The cost of violence/stress at work and the benefits of a violence/stress-free working environment*. Geneva: International Labour Organization.

- Houkes, I., Janssen, P. P. M., de Jonge, J., & Bakker, A. B. (2003). Specific determinants of intrinsic work motivation, emotional exhaustion and turnover intention: A multisample longitudinal study. *Journal of Occupational and Organizational Psychology*, *76*, 427-450.
- Hunter, J. E., & Schmidt, F. L. (1990). *Methods of meta-analysis*. Newbury Park, CA: Sage Publications.
- Hunter, J. E., & Schmidt, F. L., & Jackson, G. B. (1982). *Meta-analysis: Cumulating research findings across studies*. Beverly Hills, CA: Sage Publications.
- Jackson, S. E. (1983). Participation in decision making as a strategy for reducing job-related strain. *Journal of Applied Psychology*, *68*, 3-19.
- Jimmieson, N. L., & Terry, D. J. (1997). Responses to an in-basket activity: The role of work stress, behavioural control, and informational control. *Journal of Occupational Health Psychology*, *2*, 72-83.
- Jimmieson, N. L., Terry, D. J., Callan, V. J. (2004). A longitudinal study of employee adaptation to organizational change: the role of change-related information and change-related self-efficacy. *Journal of Occupational Health Psychology*, *9*, 11-27.
- Johnson, J. R., Bernhagen, M. J., Miller, V., & Allen, M. (1996). The role of communication in managing reductions in work force. *Journal of Applied Communication Research*, *24*, 139-164.
- Jones, J. R., Huxtable, C. S., Hodgson, J. T., & Price, M. J. (2003). *Self-reported work-related illness in 2001/02: Results from a household survey*. Sudbury: HSE Books.
- Kammeyer-Mueller, J. D., & Wanberg, C. R. (2003). Unwrapping the organizational entry process: Disentangling multiple antecedents and their pathways to adjustment. *Journal of Applied Psychology*, *88*, 779-794.
- Karasek, R. A. (1979). Job demands, job decision latitude, and mental strain: Implications for job redesign. *Administrative Science Quarterly*, *24*, 285-308.
- Kernan, M. C., & Hanges, P. J. (2002). Survivor reactions to reorganization: antecedents and consequences of procedural, interpersonal, and informational justice. *Journal of Applied Psychology*, *87*, 916-928.
- Kivimäki, M., Elovainio, M., & Vahtera, J. (2000). Workplace bullying and sickness absence in hospital staff. *Occupational and Environmental Medicine*, *57*, 656-660.
- Kivimäki, M., Elovainio, M., Vahtera, J., & Ferrie, J. E. (2003). Organisational justice and health of employees: Prospective cohort study. *Occupational and Environmental Medicine*, *60*, 27-34.
- Kivimäki, M., Sutinen, R., Elovainio, M., Vahtera, J., Rasanen, K., Toyry, S., Ferrie, J. E., & Firth-Cozens, J. (2001). Sickness absence in hospital physicians: 2 year follow up study on determinants. *Occupational and Environmental Medicine*, *58*, 361-366.
- Kivimäki, M., Vahtera, J., Thomson, L., Griffiths, A., Cox, T., & Pantti, J. (1997). Psychosocial factors predicting employee sickness absence during economic decline. *Journal of Applied Psychology*, *82*, 858-872.

- Landsbergis, P. A., & Vivona-Vaughan, E. (1995). Evaluation of an occupational stress intervention in a public agency. *Journal of Organizational Behavior*, *16*, 29-48.
- Leymann, H. (1990). Mobbing and psychological terror at workplaces. *Violence and Victims*, *5*, 119-126.
- Leymann, H. (1992). Från Mobbning till Utslagning i Arbetidslivet. Stockholm: Publica.
- Mackay, C. J., Cousins, R., Kelly, P. J., & McCaig, R. H. (2004). Management Standards and work-related stress in the UK: Policy background and science. *Work and Stress*, *18*, 91-112.
- Major, D. A., Kozlowski, S. W. J., Chao, G. T., & Gardner, P. D. (1995). A longitudinal investigation of newcomer expectations, early socialization outcomes, and the moderating effects of role development factors. *Journal of Applied Psychology*, *80*, 418-431.
- McFadden, M., & Demetriou, E. (1993). The role of immediate work environment factors in the turnover process: A systematic intervention. *Applied Psychology: An International Review*, *42*, 97-115.
- Melchior, M., Niedhammer, I., Berkman, L. F., & Goldberg, M. (2003). Do psychosocial work factors and social relations exert independent effects on sickness absence? A six year prospective study of the GAZEL cohort. *Journal of Epidemiology and Community Health*, *57*, 285-293.
- Moore, S., Grunberg, L., Greenberg, E. (2004). Repeated downsizing contact: The effects of similar and dissimilar layoff experiences on work and well-being outcomes. *Journal of Occupational Health Psychology*, *9*, 247-257.
- Niedhammer, I., Bugel, I., Goldberg, M., Leclerc, A., & Gueguen, A. (1998). Psychosocial factors at work and sickness absence in the Gazel cohort: A prospective study. *Occupational and Environmental Medicine*, *55*, 735-741.
- North, F. M., Syme, S. L., Feeney, A., Shipley, M., & Marmot, M. (1996). Psychosocial work environment and sickness absence among British civil servants: The Whitehall II study. *American Journal of Public Health*, *86*, 332-340.
- O'Connell, C. E., & Korabik, K. (2000). Sexual harassment : The relationship of personal vulnerability, work context, perpetrator status, and type of harassment to outcomes. *Journal of Vocational Behavior*, *56*, 299-329.
- Parkes, K. R. (1995). The effects of objective workload on cognitive performance in a field setting: A two-period cross-over trial. *Applied Cognitive Psychology*, *9*, S153-S171.
- Parkes, K. R., Styles, E. A., & Broadbent, D. E. (1990). Work preferences as moderators of the effects of paced and unpaced work on mood and cognitive performance: A laboratory simulation of mechanized letter sorting. *Human Factors*, *32*, 197-216.
- Patterson, M., Warr, P., & West, M. (2004). Organizational climate and company productivity: The role of employee affect and employee level. *Journal of Occupational and Organizational Psychology*, *77*, 193-216.
- Rhoades, L., & Eisenberger, R. (2002). Perceived organizational support: A review of the literature. *Journal of Applied Psychology*, *87*, 698-714.

- Robinson, S. L., & Rousseau, D. M. (1994). Violating the psychological contract: Not the exception but the norm. *Journal of Organizational Behavior*, *15*, 245-259
- Rosenthal, R., & DiMatteo, M. R. (2001). Meta-analysis: Recent developments in quantitative methods for literature reviews. *Annual Review of Psychology*, *52*, 59-82.
- Sauter, S. L., Murphy, L. R., & Hurrell, J. J., Jr. (1990). Prevention of work-related psychological disorders. *American Psychologist*, *45*, 1146-1158.
- Schweiger, D. M., & Denisi, A. S. (1991). Communication with employees following a merger: a longitudinal field experiment. *Academy of Management Journal*, *34*, 110-135.
- Searle, B. J., Bright, J. E. H., & Bochner, S. (1999). Testing the 3-factor model of occupational stress: The impact of demands, control and social support on a mail sorting task. *Work and Stress*, *13*, 268-279.
- Searle, B. J., Bright, J. E. H., & Bochner, S. (2001). Helping people to sort it out: The role of social support in the job strain model. *Work and Stress*, *15*, 328-346.
- Smith, C. S., Tisak, J., Hahn, S. E., & Schmieder, R. A. (1997). The measurement of job control. *Journal of Organizational Behavior*, *18*, 225-237.
- Smulders, P. G. W., & Nijhuis, F. J. N. (1999). The job demands-job control model and absence behaviour: results of a 3-year longitudinal study. *Work and Stress*, *13*, 115-131.
- Tepper, B. J., Duffy, M. K., & Shaw, J. D. (2001). Personality moderators of the relationship between abusive supervision and subordinates' resistance. *Journal of Applied Psychology*, *86*, 974-983.
- Tharenou, P. (1993). A test of reciprocal causality for absenteeism. *Journal of Organizational Behavior*, *14*, 269-290.
- Tubre, T. C., & Collins, J. M. (2000). Jackson and Schuler (1985) revisited: A meta-analysis of the relationships between role ambiguity, role conflict, and job performance. *Journal of Management*, *26*, 155-169.
- Vahtera, J., Kivimäki, M., Pentti, J., Theorell, T. (2000). Effect of change in the psychosocial work environment on sickness absence: A seven year follow up of initially healthy employees. *Journal of Epidemiology and Community Health*, *54*, 484-493.
- Vahtera, J., Pentti, J., & Uutela, A. (1996). The effect of objective job demands on registered sickness absence spells; do personal, social and job-related resources act as moderators? *Work and Stress*, *10*, 286-308.
- Wahlstedt, K. G. I., & Edling, C. (1997). Organizational changes at a postal sorting terminal – their effects upon work satisfaction, psychosomatic complaints and sick leave. *Work and Stress*, *11*, 279-291.
- Wall, P. B., Kemp, N. J., Jackson, P. R., & Clegg, C. W. (1986). Outcomes of autonomous work groups: A long-term field experiment. *Academy of Management Journal*, *29*, 280-304.

Wall, T. D., Jackson, P. R., & Davids, K. (1992). Operator work design and robotics system performance: A serendipitous field study. *Journal of Applied Psychology, 77*, 353-362.

Wanberg, C. R., & Kammeyer-Mueller, J. D. (2000). Predictors and outcomes of proactivity in the socialization process. *Journal of Applied Psychology, 85*, 373-385.

7. APPENDIX 1: EXCLUSION CRITERIA

We did not review articles that examined links between the six sources of stress and the following outcomes: mental health (e.g., anxiety, strain, stress, depression, and burnout), physical health (e.g., musculoskeletal pain), work-family conflict, job satisfaction, organisation commitment, or motivation. In cases where a number of articles are based on the same data set, we included only one of the relevant studies. For example, although the Whitehall II studies resulted in several relevant publications (e.g., Marmot, 1994; Marmot et al., 1995; North et al., 1993; 1996; Stansfield et al., 1997), we reviewed the North et al (1996) study, only. Finally, to avoid duplication, we tried to exclude any study that was incorporated into one of the published meta-analyses that we analysed for this report.



MAIL ORDER

HSE priced and free
publications are
available from:
HSE Books
PO Box 1999
Sudbury
Suffolk CO10 2WA
Tel: 01787 881165
Fax: 01787 313995
Website: www.hsebooks.co.uk

RETAIL

HSE priced publications
are available from booksellers

HEALTH AND SAFETY INFORMATION

HSE Infoline
Tel: 0845 345 0055
Fax: 0845 408 9566
Textphone: 0845 408 9577
e-mail: hse.infoline@natbrit.com
or write to:
HSE Information Services
Caerphilly Business Park
Caerphilly CF83 3GG

HSE website: www.hse.gov.uk

RR 431