



# **Ethnicity, work characteristics, stress and health**

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**RESEARCH REPORT 308**



# Ethnicity, work characteristics, stress and health

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This study had three main aims: to determine whether different ethnic groups report similar levels of work stress and whether they show similar associations between work characteristics, work stress and health; to determine whether different ethnic groups have similar profiles of associations between demographic and occupational factors and stress; and third to give guidance on work issues associated with ethnicity. The results showed an association between ethnicity and work stress. Underlying this seemed to be racial discrimination which, particularly in combination with gender and ethnicity, had a strong influence on work stress. Similarly, ethnicity and psychological distress were associated, reflecting links between psychological distress and both racial discrimination and work stress. Well-established associations between work characteristics and stress were replicated. These effects, and the profile of other associated factors, were similar in the three ethnic groups. The results show that consideration must be given to how ethnicity affects workers and greater responsibility for its management fostered. In addition, the effects of racial discrimination on performance must be considered and minimum practice standards established. These should involve the acknowledgement and inclusion of all ethnic groups and cultural issues in all work practices and procedures. Tackling racial discrimination at work, by creating an inclusive, supportive and open workplace, would impact on work stress and reduce the potential for psychological damage.

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# EXECUTIVE SUMMARY

## BACKGROUND

In the last 25 years there has been a large body of research on work characteristics and their influence on the development of ill-health, initially coronary heart disease and latterly psychiatric disorder and musculoskeletal problems. Similarly, there has been growing concern about the scale of occupational stress. Ethnicity and occupational health and safety has also become a topic of current interest.

The purpose of the present research was to investigate the prevalence of reported occupational stress and psychiatric disorder in Black Caribbean, Asian and White workers and to understand the reasons for differences in occupational stress between ethnic groups. In an earlier study, the Bristol Stress and Health at Work Study, 30% of the non-White group reported very high, or extremely high, levels of stress at work compared to 18% of white workers. It is important to understand why there were excess stress levels in ethnic minority workers but it was not possible to pursue this further as the proportion of non-White workers in the Bristol sample was small.

The aims of the current research were as follows:

1. To determine whether different ethnic groups (Whites, Asians, and Black Caribbeans) report similar levels of work characteristics/stress and whether they show similar or different associations between work characteristics, reporting of occupational stress and reports of general health.
2. To determine whether different ethnic groups have similar profiles of associations between demographic and occupational factors and reported stress.
3. To give guidance to employers and those concerned with people at work on any specific work issues associated with ethnicity.

## SECONDARY ANALYSIS OF EXISTING DATASETS

Data from the Bristol Stress and Health at Work Study were combined with the more recent and similarly designed Cardiff Health and Safety at Work Study. Initial analyses



confirmed the Bristol study findings that more non-White workers reported high levels of stress (28% compared to 19%). This seemed primarily to reflect excess stress levels among Black Caribbeans: 36% compared to 19% of Whites and 16% of South Asians.

## **MAIN STUDY**

Following a pilot study a household interview design was chosen based in East London. Black Caribbean, Bangladeshi and White Groups were studied and 204, 206 and 216 people from each ethnic group respectively took part in the first interview. Thirty-six participants (6 males and 6 females from each ethnic group) also later took part in an in-depth follow-up interview. They were selected as a group who had reported moderate to high work stress at the first interview, and had a wide range of both perceived discrimination and occupations.

## **RESULTS**

### **ETHNICITY AND WORK STRESS**

After controlling for demographic, occupational and other factors, and work characteristics, there was a significant association between work stress and ethnicity. Racial discrimination, particularly in combination with gender and ethnicity, was identified as having a strong influence on work stress. As a result Black Caribbean females who had experienced racial discrimination were most likely to report high work stress. These findings were strongly supported by the follow-up interview data which showed that, among Black Caribbean women, discrimination at work manifested in verbal racial abuse, unfair work practices, and being less valued by management (including racist managers). This led to feelings of confusion, rejection and isolation, and left participants devalued, guarded and ignored.

Certain work characteristics were also associated with work stress: higher effort reward imbalance, greater job demand, and lower control over work were all associated with work stress. The profile of both work characteristics and other factors associated with work stress was similar for the three ethnic groups.

## **ETHNICITY AND PSYCHOLOGICAL DISTRESS**

After controlling for work stress, work characteristics, demographic, personality, occupational and other factors, there was also an association between ethnicity and psychological distress. Further analyses suggested that this may be linked to other factors such as work stress, racial discrimination and gender. Groups who were more likely to report work stress, such as those who had experienced racial discrimination, were therefore correspondingly more likely to suffer psychological distress. Again these results were strongly supported by the follow-up interview data. It was also apparent that cultural or ethnic identity may be influential in psychological distress, and that further study of the measurement and role of this particularly complex construct is necessary.

There were also associations between work characteristics and psychological distress, namely higher extrinsic and intrinsic effort, and lower reward and total support. As with work stress, the pattern of work characteristics and other associations with psychological distress varied little by ethnicity.

## **ETHNICITY AND GENERAL HEALTH**

The data suggested that any influence of ethnicity on poor general health was comparatively small among these relatively young workers. However, the associations identified in the study between both psychological distress and poor health, and work stress and psychological distress, highlight the potential for work stress to be detrimental to health. These findings were also supported by the follow-up data.

## **CONCLUSIONS**

The combination of racial discrimination with gender and ethnicity is powerfully influential in work stress. This makes particular groups (such as Black Caribbean women who have experienced racial discrimination) more likely to experience work stress. Tackling racial discrimination at work, by creating an inclusive, supportive and open workplace, would impact on work stress, and would in turn reduce the potential for psychological damage.

## **IMPLICATIONS**

Employers need to consider: a) how ethnicity affects working practices, working relationships, values about work and tensions between home and work; and b) how work performance is affected by workplace discrimination. Best practice should at minimum include guidelines for managing discrimination at work and should acknowledge the existence of discrimination and legitimise the expression of concerns about discrimination. As a progressive response to secure the best from the workforce, additional skills and practices can be evolved that allow managers to facilitate discussing discrimination, and problem solving responses to it. This will also require a mature attitude to appreciate how culture influences attitudes to work and grievance procedures. Managing the differences between ethnic groups at work could be facilitated by talking about culture sensitively with employees at all organisational levels, as well as keeping in mind how individuals may inadvertently be contributing to a hostile and discriminatory environment.

Findings from this study support the use of existing management standards setting out guideline levels for demands, control, support, relationships and bullying in workplaces across different ethnic groups. However, the more subtle cultural and ethnic influences that affect productivity, and ensure well being of the workforce, were evident but warrant further exploration. The one area which clearly does need more specific targeted investigation and policy action is that of discrimination against women, and specifically, Black Caribbean women.

# **1. INTRODUCTION**

## **1.1 OCCUPATIONAL HEALTH AND SAFETY AND ETHNIC MINORITIES**

A recent review of the occupational health and safety of ethnic minority groups in Britain has examined “whether certain minority ethnic groups are disproportionately affected by work-related health and safety outcomes, issues or activities” (Szczepura et al 2004). The UK ethnic minority population is sizeable and concentrated in certain geographical locations (see next section). This population is generally younger than the white majority and ethnic minorities will increase as a proportion of the workforce. The two main groups are the South Asians and Afro-Caribbeans. The above review provides a comprehensive account of ethnicity and accidents, and also some aspects of ethnicity and work-related ill-health. Certain areas, such as ethnicity and stress at work receive little coverage due to the dearth of data on the topic. Indeed, the authors state that in general the topic of ethnic minorities and work-related ill-health is an under researched area in the UK, with most of the research coming from the USA. In terms of workplace stress, several US studies indicate that ethnic minorities experience a more negative work environment (especially in terms of discrimination and harassment) that can lead to increased stress. A secondary analysis of the Bristol Stress and Health at Work data (Smith et al 2000b) revealed similar results and the present project aimed to extend this by collecting new quantitative and qualitative data.

## **1.2 CONCEPTUALISING AND MEASURING ETHNICITY**

Classification of individuals on a racial basis is problematic as race is generally defined by an external source in terms of physical characteristics, such as skin colour (Betancourt and Lopez 1993), hence supporting the monogenists perspective of a hierarchy of the human race. Huxley and Haddon (1935) first suggested that the term ‘race’ should be replaced by ethnicity, since the latter was devoid of the political connotations of racial difference. This, they suggested, would allow human diversity to be studied in a neutral, value-free manner. Betancourt and Lopez (1993) support this argument adding that there are often greater differences in, rather than between, racial groups making any comparison on the basis of skin colour and hence race irrelevant; an argument supported by Zuckerman’s (1990) genetics argument. This makes

categorisation of people by racial characteristics extremely difficult (Jones 1991, Zuckerman 1990) and the use of 'ethnicity' more appropriate.

The term ethnicity derives from the Greek words 'ethnos' describing the people of a nation or a tribe and 'ethnikos' which stands for national (Betancourt and Lopez 1993). These two Greek words form a recurring theme in defining ethnicity as a nation or group who share one or all of the following: a common nationality, culture, language, race, religion and common descent (Betancourt and Lopez 1993, Costa and Bamossy 1995, Hirschman 1983, Phinney 1996, Venkatesh 1995).

Alternative definitions of ethnicity focus upon migration and resulting minority status. Weber (1968 p389) argues that ethnicity is merely a matter of belief, describing ethnic groups as "those human groups that entertain a subjective belief in their common descent because of similarities of physical type or custom or both, or because of memories of colonisation and immigration". Venkatesh (1995) shares this definition, adding that ethnicity is an ideologically fashioned term to describe a group who is culturally and/or physically outside the dominant cultures of the day. This implies ethnicity only becomes apparent or experienced when one is in a minority.

Defining ethnicity is not helped either in the health service. The common measures of ethnicity in health settings are: (a) physical attributes (Harrison et al 1988); (b) physical attributes plus place of birth (Dunn and Fahy 1990) or place of parents birth (McKenzie et al 1995); (c) hospital notes (Perkins and Moodley 1993); (d) hospital notes plus discussion with health staff (Sugarman and Craufurd 1994) or country of birth (Davies et al 1996); (e) discussion with health staff alone (Flannigan et al 1994); (f) self-assigned ethnicity (King et al 1994). Indeed, such ethnic measures draw unfavourable comparisons to the argument that race/ethnicity is generally defined by an external source. In other words, in defining a group as 'Asian', there is an inherent danger of the ethnic categorisation being applied by an external group, i.e. British 'White' society.

Isajw's (1974 p118 and p120) definition provides a broader, more comprehensive approach to ethnicity:

"Group or category of persons who have common ancestral origin and the same cultural traits, who have a sense of peoplehood and Gemeinschaft type of relations...

and have either minority or majority status in a larger society with membership of an ethnic group an involuntarily group of people who share the same culture”.

Many anthropologists, psychologists and sociologists generally agree that ethnic categories are imprecise and arbitrary, “social constructions rather than natural entities that are simply ‘out there’ in the real world” (Waters and Eschbach 1995 p421). Both ethnic categories and the labels for these categories vary over time, context and individuals. Even in an ethnic group whose members share a relatively precise ethnic label there is tremendous heterogeneity. This heterogeneity has been examined in terms of social class and education, generation of immigration, geographical region, family structure and size and composition of the ethnic community, among other factors that differentiate subgroups (Harrison et al 1988). Due to in-group variation, ethnic group membership alone cannot predict behaviours or attitudes in any psychologically meaningful way (Phinney 1996).

Barth (1969), de Vos (1975) and Venkatesh (1995) conclude that ethnicity should instead be defined by self-identification of the group concerned, mediated by the perceptions of others.

The next section considers details of the UK ethnic minority population.

### **1.3 ETHNIC MINORITIES IN THE UK**

The ethnic minority population of the UK is 4.6 million (7.9%), half of which are South Asian (Bangladeshi, Indian, Pakistani or other Asian origin) and a quarter are Black (Black Caribbean, Black Black or other Black). The largest ethnic minority group is Indian, followed by Pakistani, Mixed, Black Caribbean, Black Black and Bangladeshi. One third of the Mixed group are from White and Black Caribbean backgrounds. Interestingly, adding this third with the total Black Caribbean count would make those with Caribbean histories the largest ethnic group in Britain.

Nearly half (45%) of the ethnic minority populations live in London, which includes 61% of all Black Caribbean’s and 54% of all Bangladeshi’s in the UK. After London the areas with the highest proportions of ethnic minorities are the West Midlands (13%), South East (8%), North West (8%) and Yorkshire and the Humber (7%). The North East and the South West have the smallest proportions (2%) of ethnic minorities.

The present project involved collection of new interview data in London. The total population of the five electoral wards from which we sampled is 47722, of which 4708 (10%) were Black Caribbean, 8998 (19%) Bangladeshi and 26456 (55%) White. The recording of 'White' in the census does not necessarily mean 'White UK born.' In addition, secondary analyses were conducted on data collected by questionnaire in the Bristol and Cardiff areas. This dual approach enabled us to determine the importance of ethnic density/isolation (by studying the area with the largest ethnic minority population and the area with the lowest) and also the importance of the method of data collection (interview vs. questionnaire).

Minority ethnic groups have a younger age structure than the White population, reflecting past immigration and fertility patterns. The 'Mixed' ethnic group has the youngest age structure where 55% are under the age of 16. The Bangladeshi group also has a young age structure, with 38% aged under 16, which is double the proportion of the White group. In contrast, the White group has the highest proportion of people aged 65 and over at 16%. The proportion of the Black Caribbean group aged 65 and over is 9% reflecting the first large-scale migration to Britain in the 1950s. Ethnic minorities will therefore rise as a proportion of the working population and as a proportion of older people in the workforce well into the 21<sup>st</sup> century (Szczepura et al 2004).

Eighty-five percent of White men and 74% of White women are economically active. Black Caribbean women have an economic activity level almost as high as White women at 72%. Bangladeshi's have the lowest economic activity rates (men at 69% and women at 22%) and they have the highest unemployment rate for men at 20%, which is four times that for White men, and 24% for women, which is six times that for White women.

Average unemployment rates (International Labour Organisation calculation) for the sampling area were 14%, compared to the national figure of 5.2%. Age profiles in Hackney and Tower Hamlets were fairly representative of national figures with the exception of the Bangladeshi population which was somewhat younger.

## 1.4 THE SCALE OF OCCUPATIONAL STRESS

The changing nature of work, and, indeed, changes in society itself, means that it is important to regularly review the levels of stress at work. Indeed, in the past it has often appeared that we have little relevant information on the current situation as can be seen from the following quote: "There are no reliable estimates of the incidence of perceived stress at work and related disorders in the British working population" (Health and Safety Commission 1997). A number of recent surveys have attempted to provide information on the scale and costs of perceived stress at work and these have recently been briefly summarised (Health and Safety Commission 1999) and are reported below.

There is now considerable evidence that perceived stress at work is widespread and is associated with ill-health at work. For example, responses to a trailer questionnaire to the 1990 Labour Force Survey (Hodgson et al 1993) suggested 182,700 cases of stress/depression a year in England and Wales caused or made worse by work. Estimates based on the 1995 Survey of Self-reported Work-related Ill Health (Jones et al 1998) indicated that approximately 500,000 people in Great Britain reported that they were suffering from work-related stress, depression or anxiety, or from an illness brought on by stress at work. Stress, depression and anxiety, with an estimated 302,000 cases in Great Britain, represented the second most commonly reported group of work-related illnesses after musculo-skeletal disorders. An estimated 261,000 people described stress at work as causing ill-health or making their health worse. These figures suggest a 30% increase in perceived stress at work from 1990 to 1995. Some of this may be due to differences in the designs of the studies. However, other factors may have been responsible for the increase. For example, increased awareness of stress at work, changing attitudes to stress at work, and changes in social and economic conditions may all be important factors.

Other types of research also suggest that stress at work may be a major problem. For example, a survey of 630 trade union safety representatives (Sparks and Cooper 1997) showed that 67% of respondents reported that their management had taken no action to reduce workplace stress. A survey of trade union members (MSF 1997) showed that 81% of respondents thought that stress was either a fairly serious or very serious problem for employees in their organisation; 72% thought that stress levels were worse than a year ago. A survey of 500 randomly selected members of the Institute of



Directors (Institute of Directors 1998) showed that nearly 40% regarded stress as a major problem in their organisation. Nearly 90% thought that working practices could be a factor affecting the level of stress that people reported. More than 60% thought that responsibility for dealing with stress at work should be shared between employers and employees.

Results from another type of survey, a survey of Institute of Management members (UMIST/Institute of Management 1997) revealed that 16% of managers said that they had taken time off work because of stress in the last 12 months. Those at lower levels of management were more likely to have taken time off than senior managers. A survey of 114 subscribers to *Employment Review* and *Occupational Health Review* (IRS Employment Review 1998) showed that 58% of respondents regarded stress as one of their company's top 3 health at work priorities, and 25% felt that it was the most important health issue. Managing stress was predicted to be the fastest growing area of work for occupational health teams. A Delphi exercise (Harrington and Calvert 1996) carried out to assess the priorities for research in occupational health placed stress second only to musculo-skeletal disorders and emphasised the need for practical strategies rather than risk factor identification. A survey of 800 small and medium-sized employers in a range of industries, carried out by MORI for HSE (MORI 1998) to establish a baseline to evaluate the success of phase 3 of the Good Health is Good Business campaign showed that 31% of those who considered stress to be a risk in their workplace classed it as a "high" risk. Stress was also perceived to be the least well controlled of all workplace risks (22% of respondents felt it was "poorly" controlled).

Such data are, for a number of reasons, imprecise and can only be used as a basis for "educated guesses" of the scale of perceived stress at work. In summary, while different studies all suggest that stress is a major problem there is considerable disagreement about the extent of it. Kearns (1986) has suggested that 40 million days are lost each year due to stress-related disorders and that up to 60% of all work absence is caused by them. More recent estimates suggest that some 91.5 million working days are lost each year through stress-related illness. It is clearly important, therefore, to provide more definitive figures on the prevalence of perceived stress at work.

Stress can be defined in several ways and it is important to use an approach which covers the different aspects of the concept. First of all, stress at work has often been regarded as a negative characteristic of the working environment. This has often led to stress being grouped with physical hazards (e.g. noise) and research being directed to measurement of exposure levels and examination of the relationship between these and health/performance outcomes. Secondly, stress has been viewed as a physiological response to a threatening or damaging environment. Another approach has viewed stress in terms of an interactional framework, one of the best examples being Karasek's (1979) model suggesting that job demands and decision latitude interact to influence health. Current approaches focus on perceived stress, defining stress as being apparent when demands exceed the ability to cope. It is important to provide information on the number and proportion of workers affected by stress at work, the effects of stress on health and the jobs most associated with stress. The trailer questionnaire to the 1990 Labour Force Survey showed that teachers, professionals and welfare workers had significantly above average rates of self-reported stress, depression and anxiety. It is, however, unclear whether these groups are at greater risk or have greater awareness of stress, or feel there is a lower stigma attached to reporting such problems. The scale of perceived stress at work can initially be addressed by considering existing data. However, previous studies have methodological problems which need to be rectified in new research. For example, there has been no clear definition of perceived stress at work and despite the fact that the inadequacy of single unvalidated one-off measures of stress is well known they continue to be used. In addition, previous research has failed to distinguish between stress at work and stress elsewhere. This is a difficult issue to examine. On the one hand it is clearly erroneous to believe that work and non-work-activities are unrelated in their psychological, physiological and health effects (the "myth of separate worlds"). However, it is possible to classify certain types of stress as work or non-work related even though this will clearly leave many types that involve interactions between the two. These interactions may take several forms. For example, the primary source of stress may occur outside work but be exacerbated by work. Similarly, stress may be work-related but have an influence on home life. Only further empirical research will provide evidence on the prevalence of these various sub-types of stress. In addition, most previous research has focused on the individual without considering either the effects on the organisation or on the person's family and the community.

Another problem with many of the surveys has been that they have investigated very selected samples. An initial requirement of estimating the scale of perceived stress at work is to survey a random community sample. Such a study has been conducted (Smith et al 2000a) and this is described and the results briefly summarised below. This study had three main aims. First, to determine the scale of perceived stress at work in a random population sample. Secondly, to distinguish the effects of stress at work from those of stress in life as a whole. Finally, to determine whether objective measures of health status and performance efficiency were related to reports of stress at work. These objectives were investigated by conducting an epidemiological survey of 17,000 randomly selected people from the Bristol Electoral Register, a follow-up survey 12 months later, and detailed investigation of a cohort from the original sample. The results revealed that approximately 20% of the sample reported very high or extremely high levels of stress at work. This effect was reliable over-time, related to potentially stressful working conditions (e.g. high job demand) and associated with impaired physical and mental health. A cohort study also suggested that high levels of stress at work may influence physiology and mental performance. The effects of stress at work could not be attributed to life stress or negative affectivity. The prevalence rate obtained in this study suggests that 5 million workers in the UK may have very high levels of stress at work.

Secondary analyses of the Bristol data were carried out to examine which demographic and occupational factors were associated with stress at work (Smith et al 2000b, Smith 2001). Analyses of the demographic variables showed that gender had little overall effect although it did interact with other factors, such as full-time/part-time employment. The middle aged workers (30-50 year olds) had slightly higher proportions in the high reported stress category than those at the extremes of the age range. Educational attainment was found to be an important factor, with those educated to degree level (or equivalent) having a higher proportion in the high reported stress category. Marital status also influenced the reporting of stress, with those who were widowed/divorced or separated having a greater proportion in the high reported stress category. The occupational variables were also found to have a sizeable impact on reporting of stress. Reported stress was greater in full-time employment than part-time employment, increased with salary, and there was a greater proportion in the high reported stress category in social group II. Reported stress was found to be highest in teachers, nurses and managers. Levels of reported stress increased as a direct

function of the number of critical features present. Ethnicity also influenced reporting of stress, and this is described in the next section.

## **1.5 ETHNICITY AND WORK STRESS**

In the secondary analyses of the Bristol data, 30% of those from ethnic minorities reported very high or extremely high levels of stress at work compared to 18% of the white workers. Unfortunately, the ethnic minority sample was small (less than 3% of the total sample) which meant that it was difficult to control for possible confounding factors. In order to examine this issue in more detail in the present project, the Bristol data were combined with a similar dataset collected in the Cardiff area (Smith et al 2004). The initial aim of these secondary analyses was to investigate whether ethnic minorities reported greater levels of stress at work, and to determine whether this applied to both South Asian and Black groups. In addition, the analyses tried to determine whether job characteristics were associated with perceived stress in a similar way in all ethnic groups and whether the association between job characteristics and ill-health (see next section) was similar in all groups.

## **1.6 JOB CHARACTERISTICS AND HEALTH**

### **1.6.1 The Job-Demand-Control-Support Model**

The Job Demand-Control Model (Karasek 1979) is perhaps the most influential model of the relationship between the psychosocial work environment and health. This model proposes that psychological strain is a product of the combination of the work situation an individual is exposed to and the amount of freedom available to make decisions at work. This strain, if present, then can propagate poor health. In the model, 'Job Demands' refers to aspects of the work environment (e.g. how fast does the individual have to work?) that influence how demanding that work is perceived to be. 'Job Control' refers to the individual's authority to make decisions and the discretionary use of their skills (i.e. how much control does one have over how they do their work each day?). 'Job Strain' refers to the state that occurs when both demands are high and when control is low. This is hypothesised as the most negative and potentially damaging scenario. When job demands and job control are both high the model hypothesises that the job is 'active' and this can have beneficial, protective effects on the individual's health. When demands are low and control is high a job is described as

'passive', the job activity levels decrease as do general problem solving activities. Thus, demand and control are hypothesised as interacting. Researchers in the 1980s added a third dimension to the model, 'Work Social Support', which led to an adaptation of Karasek's model called the Job Demand-Control-Support Model (Johnson & Hall 1988). This adapted model introduced the concept of 'Iso-Strain', where demands are high, control is low and social support is also low. It is this Job-Demand-Control-Support Model that will be utilised in this investigation.

The body of research that exists on the relationship between the Job (Iso-) Strain Model and health outcomes has generally suggested support for two related yet different hypotheses:

- The Strain Hypothesis
- The Buffer Hypothesis

The Strain Hypothesis suggests that employees working in high strain jobs experience the lowest well-being; this is demonstrated where demand, control and support have strong independent effects. This is relatively undisputed; job demands, job control and social support all have strong independent effects on a range of health related outcomes. The Buffer Hypothesis states that job control (and social support) can moderate the negative effects of high demand. This is demonstrated when there is an interaction between the job strain dimensions, where high demand is moderated by control and/or social support. For example, high control was found to moderate the effects of high demands leading to decreased blood pressure (Chapman et al 1990). Evidence for this hypothesis is by no means nonexistent but is more equivocal.

The previous 20 years have produced a lot of literature on these models and these different hypotheses. There is considerable evidence that the concepts of job demand, job control and work social support are very important to any understanding of work stress. An important question that needs to be briefly addressed is to what degree the strain and buffer hypotheses are supported? van der Doef and Maes (1999) addressed these questions with regards to general psychological well-being (as the outcome measure). Looking at 20 years of empirical research, 63 samples were highlighted and analysed. This review suggested that, regarding psychological well-being at least, the Strain Hypothesis was better supported. This has been supported by recent research (e.g. Stansfeld et al 1999b).

The main interest in the present research is in associations between job characteristics and psychological distress. Demanding jobs have been associated with an increased risk of psychiatric disorder (Stansfeld et al 1999a), depression (Stansfeld et al 1998, Tsutsumi et al 2001), anxiety (Perrewe 1986), 'psychological distress' (Bourbonnais et al 1996, Marshall et al 1997, Mino et al 1999, Yeung et al 2001) and poor mental health status (Yang et al 1997). Low job satisfaction, depression and psychosomatic symptoms have been found to be significantly higher in jobs with high demands and low control (Landbergis 1988). Neurotic disorders were associated with high job strain in secondary school teachers (Cropley et al 1999). Anxiety has been found to be associated with high job strain (Cropley et al 1999, Evans & Steptoe 2002)

### **1.6.2 The Effort-Reward-Imbalance Model**

The Effort-Reward Imbalance model was proposed as an alternative to the Job Demand-Control-Support Model (Karasek 1979) and the Person-Environment-Fit Model (French et al 1982) to assess the negative impact of work demands on health. The theoretical concept behind the model states that the degree of reciprocity between the individual and their work environment is the crucial factor in determining potential negative health outcomes: an imbalance between the amount of perceived effort and rewards received is hypothesised to result in reduced well-being.

The ERI model distinguishes between two types of effort: intrinsic and extrinsic. Intrinsic effort is defined as the level of motivation experienced by an individual in a demanding situation and their need for control, whereas extrinsic effort refers to the actual demands of the job. Three types of reward are defined by the model: financial gains, 'esteem' (as measured by recognition of achievements and support from colleagues and superiors) and 'status control' (i.e. threats to self-regulatory functions such as job insecurity or lack of promotion prospects). With regards the definition of control, the ERI model differs from the Job Demand-Control-Support Model (Karasek 1979, Johnson and Hall 1988) in that the former incorporates the issue of job insecurity, which given current labour market forces may in some instances be of more significance than level of control over the task. Siegrist (1996) states that "...lack of reciprocity between costs and gains (i.e., high-cost/low gain conditions), define a state of emotional distress with special propensity to autonomic arousal and associated strain reactions." For example, an individual subjected to high levels of job demand,

low job security and poor promotion prospects whilst achieving at a consistently high level, will likely experience emotional distress, and potentially poor health as a result of such an imbalance.

The link between effort-reward imbalance and mental distress is relatively well established (Stansfeld et al 1999a). van Vegchel et al (2002) studied mental exhaustion as a possible outcome of ERI and found the risk of exhaustion to be more than 7 times higher for those reporting high effort and low salary than for those reporting low effort and high salary. Exhaustion was also significantly more likely under conditions of high effort and low esteem than where effort was low and esteem high. Where effort was reported to be high and job security low, mental exhaustion was nearly 11 times as likely to be reported as when effort was low and job security high. Peter et al (1998) studied ERI and fatigue and sleep disturbance as possible indicators of poor mental health and found a significant association between high effort/low reward occupations and frequency of sleep disturbance and self-reported fatigue.

In the Whitehall II sample, Kuper et al (2002) found further evidence to support a link between ERI and poor mental functioning, as measured by the SF-36 Health Survey. The odds ratio for mental functioning was 2.24 (95% CI = 1.89 - 2.65) and this was not significantly reduced when coronary heart disease risk factors were controlled for. Stansfeld et al (1999a) carried out a study of the influence of ERI on General Health Questionnaire (GHQ) scores within the same cohort, and reported a significant relationship at follow up, despite controlling for age, employment grade and baseline GHQ scores.

Burnout is often considered to result from stress at work and is a symptom of severe psychological distress. Bakker et al (2000) studied ERI and its possible association with burnout amongst a sample of nurses. Analysis of variance revealed a significant main effect of ERI on burnout: in other words, nurses who felt their level of reward did not reflect their efforts at work reported a greater degree of emotional exhaustion than those who did not. A significant effect of intrinsic effort on emotional exhaustion was also reported.

## **1.7 THE GOVERNMENT/HSE'S APPROACH TO OCCUPATIONAL STRESS**

Results from the Whitehall Study and the Bristol Stress and Health at Work study showed that work place stress was a major occupational health issue. HSE's response was to state that "Ill health resulting from stress caused at work has to be treated the same way as ill health due to other physical causes present in the work place. Mental well-being is as important as physical well-being." The Management of Health & Safety at Work Regulations 1999 required all employers to carry out regular risk assessments, identifying hazards and taking appropriate action. This applies to occupational stress. In 2001 a guidance package was produced that offered practical advice on how to deal with stress at work. The latest part of the stress strategy has been to develop management standards against which to measure organisational performance in dealing with occupational stress. This strategy is aimed at meeting the government target of reducing occupational stress by 20%.

## **1.8 POTENTIAL PROBLEMS OF NOT CONSIDERING ETHNICITY AND OCCUPATIONAL STRESS**

There has been no consideration of ethnicity in studies of stress, and measures of work characteristics and/or work stress have been developed within (predominantly) single ethnic group datasets. In addition, single methodologies have often been used and there is a need to address the topic using both quantitative and qualitative approaches. Within each method different sampling frames and research tools need to be used to determine whether effects can be generalised to all groups or only apply to specific sub-samples. Initial approaches to the topic must be viewed with caution due to the small samples that will inevitably be studied to begin with. Lack of sophistication in conceptualisation and measurement will also be an initial problem and the research reported here should be viewed as the start of research in this area rather than an exhaustive or definitive account. As will be seen in the next section, this view can be applied to ethnicity and occupational health in general.

## **1.9 ETHNICITY AND OCCUPATIONAL HEALTH**

Szczepura et al (2004) have reviewed the literature on associations between ethnicity and health in those of working age. UK South Asians (especially Bangladeshis and Pakistanis) in the age range 16-64 years exhibit higher levels of limiting long term



illness and self-reported ill-health. Black Caribbeans report the next highest levels of poor health but Black Blacks and Chinese report better health than the White population. Research findings on musculo-skeletal disorders are mixed, with few studies identifying a significant effect of ethnicity. Similarly, few studies of cardiovascular disease have identified a significant influence of ethnicity. While there is a large literature on ethnicity and mental health (Nazroo 1997) we have no evidence of different associations between job characteristics and psychological distress in different groups.

One of the major problems with previous research on ethnicity and health is that it has failed to consider important issues such as discrimination and culture. The present project involved a preliminary investigation of these complex issues and the background and general approach is given in the next two sections.

### **1.10 RACIAL DISCRIMINATION AND STRESS AND HEALTH**

Nazroo (2003) has reviewed evidence showing differences in health across ethnic groups. He suggests that social and economic inequalities, underpinned by racism, are fundamental causes of ethnic inequalities in health. A number of studies have also shown that racial discrimination is related to reported symptoms (e.g. Klonoff et al 1999) and objective signs of disease (Troxel et al 2003). There have been few studies that have investigated the effects of racial discrimination on occupational health. Roberts et al (2004) interviewed 1,728 American workers about aspects of their jobs, their exposure to racial discrimination at work, and dimensions of mental health. American minorities reported more discrimination at work than White Americans and there was evidence of institutional discrimination against minorities. Those who reported that they had been discriminated against were found to have poorer mental health outcomes than their same-race counterparts who did not acknowledge being discriminated against. These results confirm the need for the development of occupational stress and health models that are cross-culturally applicable. One of the problems with developing such models is the definition of culture. This issue is discussed in the next section.

## **1.11 CULTURE**

Cultural or ethnic identity describes a process and outcome for a person's sense of 'who they are' and 'how they might be perceived' by others in their living and working environment. As the terms culture and ethnicity have many definitions drawn from disciplines such as anthropology, psychology and sociology, it is generally agreed that the construct is multi-faceted and interconnected and this offers researchers a difficult challenge. The strength of cultural or ethnic identity has some bearing on a person's coping with the harmful effects of life and work stress and mental health, and while the empirical evidence for this is limited, it is argued that a strong cultural or ethnic identity buffers the harmful effects of stress. Therefore, this topic is important to explore in a study such as this, and breaks new ground in the discipline. An initial issue is how to conceptualise culture. In 1952 Kroeber and Kluckholm cited 164 definitions of culture, illustrating the difficulty in achieving a comprehensive definition. By 1981 Budde et al stated researchers were still unable to conceptualise and define 'culture'. Triandis et al (1986 p258) describes culture as "a fuzzy, difficult to define construct". Furthermore, LaFramboise et al (1993) criticise definitions of culture for either omitting a salient aspect of culture or to generalise beyond any real meaning. The research challenge lies in how best to explore and investigate culture keeping in mind the epistemologies that one holds and their limitations. Measurement of ethnic identity and acculturation is also a major issue (see Section 2).

## **1.12 AIMS AND OBJECTIVES**

Finally, this section presents the specific aims of the study and the questions it was designed to address.

The initial core questions addressed in the present project were:

1. Will the prevalence of reported stress at work vary across different ethnic groups?
2. Will racial discrimination and cultural identity be important factors related to perceived stress at work?
3. Will job characteristics show similar associations with perceived stress and health outcomes in the different ethnic groups?
4. Will the associations between demographic/occupational factors and stress vary across the ethnic groups?

The aim of the follow-up phase investigation was to help further interpret and understand the findings from the first phase, so that the mechanisms of perceived discrimination and work stress and their connections to ethnicity could be more accurately determined and understood.

### **1.13 IMPLICATIONS OF PRESENT RESEARCH**

It is clearly the case that guidance is needed regarding diversity awareness at work. Little is known about ethnicity and occupational health and the present project aimed to obtain information that can be used to give guidance on this topic. The starting point was to take approaches that have been used with largely white employees and determine whether the approaches and prior findings apply to ethnic minorities. The second aim was to consider topics such as racial discrimination with a view to demonstrating the importance of promoting diversity awareness and inclusion in the work place.

## **2. METHODS**

### **2.1 SECONDARY ANALYSES OF EXISTING DATASETS**

#### **2.1.1 Bristol Study**

In total 17,000 people were selected at random from the Electoral Register for Bristol in 1998. Questionnaires were sent first using regular post. Reminder letters and questionnaires were sent by regular mail four weeks later. Telephone reminders followed after a further four weeks, and a final letter and questionnaire were sent recorded delivery four weeks later. Approximately a year later follow-up study questionnaires were sent to all 4673 respondents who indicated during in their first questionnaire that they would be willing to complete another. The mailing strategy described above was followed again.

#### **2.1.2 Cardiff Study**

Thirty thousand people were selected at random from the Electoral Registers for Cardiff (22,500) and Merthyr Tydfil (7,500) in 2001. Questionnaires were posted using regular mail. No identifiers were attached, so it was not possible to follow any reminder procedures.

### **2.2 NEW DATA COLLECTION**

#### **2.2.2 Pilot Study**

A pilot study was carried out a) to assess the feasibility of identifying and recruiting ethnic minority groups through postal questionnaires, and b) to consider the use of measures designed to identify cultural issues, such as acculturation and discrimination. The results showed that, while the acculturation and discrimination measures were reliable and acceptable, a postal survey would have to be unfeasibly large to successfully identify a large enough number of eligible respondents from ethnic minority groups. Moreover, it was unlikely that postal questionnaire methods would yield a representative sample of the relevant ethnic groups. A more targeted and direct recruitment method was therefore designed.

### **2.2.2 Interview Survey**

Households were selected on a 1:15 ratio from a database drawn from the Electoral Registers and Post Office Address Files for 5 council wards in Hackney and Tower Hamlets. In total 3181 households were selected, and interviews were attempted at 3177 of them. Up to four attempts were made at each identified household to recruit participants. If the resident refused or did not fit the research criteria, interviews were attempted at up to 6 households on either side of the one identified. This occurred 2769 times.

Inclusion criteria were: being in paid work; aged between 18 and 65 years; self-reported ethnicity: Black Caribbean, Bangladeshi or White (UK born). Interviews were carried out by a team of 25, and interviewer and interviewee ethnicity and gender were matched as often as possible. Altogether 626 people were interviewed between September 2002 and January 2003.

Table 1 below summarises the measures included in the interviews.

**Table 1**  
**Measures included in the interviews**

Measures used in interviews	
Screening information	Employment Age Ethnic group
Health	General health General stress Long-term illness Sick leave GP and A&E consultations
Lifestyle	Smoking Alcohol
Work	Occupation Occupational factors Karasek JCI Siegrist E-R imbalance Work related illness
Mental health	Neuroticism GHQ
Discrimination	Racial discrimination (discrimination at work on the basis of race, culture or ethnicity) Other discrimination (discrimination at work on the basis of age, class, disability, gender or sexuality)
Culture	Phinney's measure of cultural identity Berry's schema
Demographics	

### 2.2.3 Follow-up Phase

A comparative, qualitative in-depth interview investigation was carried out in early 2004. Twelve participants (6 men and 6 women) from each ethnic group (total N=36) were selected from the first phase database. The sample was selected on five criteria: 1) ethnicity; 2) gender; 3) reporting moderate to high levels of work stress; 4) reporting

a range of responses of perceived discrimination; and 5) working in a range of occupations.

Those selected received a letter of invitation containing the interview questions to help achieve informed consent and to prepare them for the face-to-face research interview in their homes. Reminders were sent as required. Interviews lasted 50-60 minutes, and were conducted by interviewers matched for ethnic group and gender. Interviews were audio-taped, and later transcribed and analysed using a thematic framework. Interviews consisted of open questions and significant care was taken to reduce and manage bias through the use of experienced interviewers and further specific training in this area. A strict ethical stance was adhered to affirming confidentiality, the right to withdraw at any time and de-sensitising and managing difficult emotions arising during and after the interview. The interview schedule is in Appendix 4, and its measures are summarised in Table 2 below.

**Table 2**  
**Measures in the qualitative follow-up study interviews**

Measures used in interviews	
General work history	Current employment Previous employment Unemployment
Work stress	Meaning of stress Causes of stress Effects of stress Stress and ethnic group
Discrimination	

#### **2.2.4 Ethical Approval**

The Bristol and Cardiff Studies were approved by their relevant internal University Ethics Committees. In addition, their protocols were scrutinised by the Local Research Ethics Committee administrators, though formal approval was not deemed necessary. The Interview and Qualitative Study Surveys were approved by the East London and City Health Authority Local Research Ethics Committee.

## 2.3 MEASURES AND ANALYSES

### 2.3.1 Ethnicity, Main Outcome Measures And Work Characteristics

**Ethnicity (simple):** the three self-reported ethnic groups studied were White (UK born), Bangladeshi and Black Caribbean based on self-ascribed ethnicity.

**Ethnicity (stratified):** comparisons were also made between each ethnic group subdivided by both sex and racial discrimination, resulting in 4 strata for each ethnic group (12 in all): male & no racial discrimination; male & racial discrimination; female & no racial discrimination; female and racial discrimination.

**Work stress:** single item asking "In general, how do you find your job?": those responding not at all, mildly and moderately stressful were compared with those responding very or extremely stressful.

**Psychological distress:** General Health Questionnaire (GHQ): those scoring 4 or less (non-cases) were compared with those with higher scores (cases).

**General health:** Single item asking "Over the past 12 months, how would you say your general health as been?": those responding excellent, very good and good were compared with those responding fair or poor.

#### **Jean Phinney's Multigroup Ethnic Identity Measure (MEIM)**

Phinney (1992) developed the 14-item, 4-point (1 = strongly disagree, 4 = strongly agree) instrument to address, conceptually and methodologically, ethnic identity as a general phenomenon across groups. The components measured by the MEIM are ethnic behaviours (socializing with one's group members and participation in cultural traditions), affirmation and belonging (feelings of attachment to one's group, ethnic pride, attitudes toward one's group), and ethnic identity achievement (understanding one's ethnicity, commitment and secure knowledge of who one is as a member of an ethnic group). The instrument also assesses attitudes toward ethnic groups other than one's own. Reliability for the MEIM was established using two samples (Phinney 1992) with alpha coefficient for the overall measure being .90.

#### **William Berry's measures of ethnic identity and acculturation**

Berry (1997) developed a bi-directional acculturation and ethnic identity model, drawing upon a two-dimensional acculturation strategy, i.e. ethnic cultural maintenance and contact with the dominant host group. In this model the existence of environmental influences, such as the degree of multi-culturalism in the host society, are recognised



as influences on the ethnic minority individual. Berry (1997) argues that his proposed framework should be used to identify acculturative stress amongst ethnic minority individuals by categorising them into four distinct acculturation strategies: (1) integration (an equal interest in engaging with both their ethnic and dominant culture; (2) separation (retention of ethnic identity and rejection of dominant cultural identity); (3) assimilation (rejection of their ethnic minority culture in favour of accepting the dominant culture) and (4) marginalisation (rejection of both their ethnic minority culture and the dominant culture). The language used and foods and clothes preferred in day to day life are significant components of ethnic culture (see definitions above) and these form the basis of the questions used in this study to unpack the acculturation strategies of the sample.

#### **Effort reward imbalance model (Siegrist) work characteristics**

**Extrinsic effort:** Situational factors which make work more demanding: those above and below the median were compared.

**Intrinsic effort:** Personal factors (such as motivation and commitment to work): those above and below the median were compared.

**Reward:** Pay, status and opportunities for advancement: those above and below the median were compared.

**Effort reward imbalance:** Ratio of effort and reward: those above and below the median were compared.

#### **Job demand control model (Karasek) work characteristics**

**Job demand:** Pace and intensity of work: those above and below the median were compared.

**Control:** Amount of control the worker has over work and the skill and variety involved: those above and below the median were compared.

**Total support:** Support from colleagues and superiors: those above and below the median were compared.

Descriptions of the demographic, personality, occupational and other factors and the work characteristics used in the analyses are in Appendix 1 Table 1.

### **2.3.2 Multivariable Analyses**

Backward stepwise logistic regression analyses have been used throughout the results. As the sample size is relatively low, groups of respondents in some levels of some variables are particularly small. The corresponding confidence intervals, therefore, are in some cases very wide. However, these analyses have been used: (i)

to allow associations to be assessed independently of (i.e. after controlling for) possible confounding factors; and (ii) to give an indication of significance. Odds ratios should be interpreted carefully, particularly where confidence limits are wide, and have not been used to indicate effect size. Furthermore, many analyses have been carried out within this relatively small sample. For these reasons, all the results presented here should be interpreted with caution.

## 3. RESULTS

### 3.1 RESPONSE RATES AND PARTICIPANTS

#### 3.1.1 Existing Bristol And Cardiff Postal Survey Dataset

In total 15041 people completed the two Bristol and Cardiff Studies (7062 (47%) and 7979 (53%) respectively). A little over half of these respondents (8755, 59%) were working, 4135 (47%) from the Bristol Study and 4620 (53%) from the Cardiff Study. The mean age of the working respondents was 40.32 years (sd=11.99), just over half (54%) were female, and 69% married or cohabiting. Three quarters (75%) worked full-time, and 47% had socio-economic class I or II occupations.

Most of these workers were White (98.1%), 75 (0.9%) were South Asian, and 86 (1.0%) were Black Caribbean. More of the Black Caribbean group were female (61%, compared to 49% of South Asians and 54% of Whites), and more South Asians worked part-time (32% compared to 25% of Whites and 22% of Black Caribbeans), though these differences were not significant. Fewer Black Caribbeans were married or cohabiting (52% compared to 69% each of South Asians and Whites,  $p=0.002$ ), fewer Black Caribbeans had socio-economic class I occupations (2%, compared to 15% of South Asians and 10% of Whites  $p=0.005$ ), and the South Asian group were younger (37.21 years (sd=12.74), compared to 41.46 years (sd=11.72) among Black Caribbeans and 40.37 years (sd=11.98) among Whites), though this was not significant ( $p=0.53$ ).

#### 3.1.2 New Data From The First Phase Interview Study

##### 3.1.2.1 Response rate

In total 626 people took part in the survey. After exclusions (those who were ineligible, non-contacts etc) the response rate was 55% (see Appendix 3 for full response rate calculation details).

### 3.1.2.2 Respondents profile

Two hundred and four (32.6%) respondents were Black Caribbean, 206 (32.9%) Bangladeshi, and 216 (34.5%) White. A little under half (44%) were female, their mean age was 35 years (sd=11.30, 18-65), and most were married (44%) or cohabiting (10%), though a further 39% were single never married. Half (50%) had a further education qualification, and one in four (25%) earned less than £10,000 per year while one in eight (13%) earned over £30,000. Most worked full-time (75%), most had permanent jobs (81%), and just over half (59%) worked in non-manual occupations. On average, respondents worked 35 hours per week (sd=13.19, 2-86).

There were significant differences between the group in terms of sex (30% of Bangladeshis were female, compared to 44% of Whites and 58% of Black Caribbeans,  $p<0.0001$ ), full-time/part-time work status (19% of Whites worked part-time, compared to 24% of Black Caribbeans and 33% of Bangladeshis,  $p=0.004$ ), contract type (73% of Bangladeshis had permanent contracts, compared to 83% of Black Caribbeans and 87% of Whites,  $p<0.0001$ ), marital status (71% of Bangladeshis were married or cohabiting compared to 45% of Black Caribbeans and 47% of Whites,  $p<0.0001$ ), education (61% of Whites had a further education qualification compared to 52% of Black Caribbeans and 36% of Bangladeshis,  $p<0.0001$ ), income (26% of Whites earned more than £30,000 per year compared to 7% of Black Caribbeans and 3% of Bangladeshis,  $p<0.0001$ ) and non-manual or manual occupation (69% of Whites had non-manual jobs compared to 57% of Black Caribbeans and 51% of Bangladeshis,  $p=0.001$ ). In addition, the groups differed in terms of mean number of hours worked per week (Whites 38 (sd=12.56), Bangladeshis 31 (sd=14.05), Black Caribbeans 35 (sd=11.89),  $p<0.0001$ ). The Bangladeshi group were also younger, though this was not significant (Bangladeshis mean age 29 (sd=7.20), Whites 38 (sd=11.51), Black Caribbeans 38 (11.84),  $p=0.63$ ).

### 3.1.3 New Data From The Follow-up In-depth Interview Phase

#### 3.1.3.1 Response data

**Table 3**  
**Interview response data**

Response	N (%)
Interview achieved	36 (29)
Non-contacts:	
Moved	16 (13)
Refused	27 (22)
Away / Busy / Sick	13 (11)
No reply	30 (25)
Total	122 (100)

In total 122 households were approached to achieve the 36 interviews. The relatively high refusal rate probably reflects the emotive nature of the topic.

#### 3.1.3.2 Participants

The participants held a wide range of occupations (e.g. accountant, assembly production worker, local council manager, nurse, postman, teacher and lecturer). The Black Caribbean group held more care and customer service occupations, the Bangladeshi group held more low grade administrative posts, and the White group held more skilled jobs. This, at least in part, reflects the national situation.

## 3.2 FINDINGS

The findings are presented in three sections: work stress; psychological distress; and general health. Each section begins with a summary of the relevant secondary analyses of the existing datasets, i.e. ethnicity and work stress, psychological distress or general health within the Bristol and Cardiff database. It then moves on to the analyses of the area within the new first phase Interview Survey data. Each section also includes findings from the follow-up in-depth interview phase to illustrate, emphasise, and support the statistical findings. The variables used in the analyses are detailed in Appendix 1 Table 1.

### 3.3 ETHNICITY AND WORK STRESS

#### Key Findings

- There was an independent association between ethnicity and work stress.
- Racial discrimination, in combination with both gender and ethnicity, was powerfully influential in work stress. As a result Black Caribbean females who had experienced racial discrimination were most likely to report high work stress.
- These findings were specific to work stress, and so are unlikely to represent a generalised increased reactivity to stress.
- Work stress was also associated with particular work characteristics: higher effort reward imbalance, higher job demand and less control over work.
- Associations (of work characteristics and other factors) with work stress were similar for all ethnic groups.

This section focuses on work stress. It aims to:

- 1) describe any association between ethnicity and work stress independent of possible confounding factors;
- 2) describe any associations between work stress and work characteristics.

#### 3.3.1 Re-analysis Of The Existing Bristol And Cardiff Studies' Data

##### 3.3.1.1 Univariable association between ethnicity and work stress

Work stress was measured using a single item asking “In general, how do you find your job?” Those responding very or extremely stressful were compared with those responding not at all, mildly or moderately stressful. This is, of course, an arbitrary cut point, selected in the light of, and to allow comparisons with, previous work (Smith et al

2000a, Smith et al 2004). Overall 19% (N=1627) of workers reported high work stress. The proportion of Black Caribbeans reporting high stress (36%, N=30) was greater than the proportions of Whites (19%, N=1585) or South Asians (16%, N=12) (see Appendix 2 Table 1). Univariable logistic regression analysis (see Table 4 below) shows this association between ethnic group and work stress ( $p=0.001$ ).

**Table 4**  
**Univariable association between work stress and ethnic group**

Ethnic group	p OR (CI)
	0.001
White	1.00
South Asian	0.83 (0.45-1.54)
Black Caribbean	2.34 (1.49-3.67)

This suggests the Black Caribbean group may be more likely to experience work stress. However, these univariable analyses do not take into account the influence of any other factors on this association.

### 3.3.2 Analysis Of Newly Collected Data

#### 3.3.2.1 Univariable associations between ethnicity and work stress

Overall 13% of respondents reported experiencing very or extremely high work stress. This is somewhat lower than the 19% in the combined Bristol and Cardiff datasets. However, the pattern of more Black Caribbeans reporting high stress (18%, N=37), compared to Whites (11%, N=24) and Bangladeshis (8%, N=17) was again very clear ( $p=0.01$ ) (see Appendix 1 Table 2 and Table 5 below).

**Table 5**  
**Univariable association between work stress and ethnic group**

Ethnic group	p OR (CI)
White	0.01 1.00
Bangladeshi	0.74 (0.38-1.41)
Black Caribbean	1.79 (1.03-3.11)

These data also point to an association between work stress and ethnicity, but again the influence of other factors has yet to be taken into account.

Data from the follow-up in-depth interview phase show that interviewees from all ethnic groups had a distinct and immediate “definition” of work stress. For example:

*“when you can’t talk to your manager”; “constant change of staff at work”; “job-role confusion”; “overloaded with work”; “juggling multi-roles”; “working long hours”; “too much pressure”; “being overworked”; “not feeling appreciated”.*

These comments clearly indicate that respondents had a distinct concept of work stress. This suggests that the first phase interview question about perceived work stress is accessing this concept, and is measuring work stress in a meaningful way.

### 3.3.2.2 Ethnicity and work stress

Many other factors (e.g. demographic and occupational) also influence stress. Analyses were therefore carried out to consider whether ethnicity remains influential even after these possible confounding factors are controlled for.

Analyses (backward stepwise logistic regression) were carried out in three stages corresponding to the three sets of possible confounding factors being considered:

1. Demographic, personality and other factors
2. Occupational factors
3. Work characteristics



Following these stages, the final logistic regression model was repeated excluding ethnicity, to allow comparisons of the associations with work stress both before and after the inclusion of ethnicity. A full description of the analysis strategy is in Appendix 1 (see Analysis Strategy section and Table 3).

There was a significant association between ethnicity and work stress independent of the other factors included in the model. In particular, Black Caribbean females who reported experiencing racial discrimination were most likely to report high work stress. This specific association seems to reflect the cumulative weight of two trends of association with work stress within the data, namely: females who had experienced racial discrimination; and Black Caribbeans who had experienced racial discrimination. Table 6 below shows the association between work stress and ethnicity. Full details are in Appendix 1 Table 4.

**Table 6**  
**Association between work stress and ethnicity**

Ethnicity stratified by racial discrimination and sex	df, p OR, CI
	11, 0.007
White male no racial discrimination	1.00
White male racial discrimination	1.75, 0.27-11.54
White female no racial discrimination	0.78, 0.26-2.34
White female racial discrimination	4.05, 0.54-30.38
Bangladeshi male no racial discrimination	0.71, 0.21-2.38
Bangladeshi male racial discrimination	0.45, 0.04-5.03
Bangladeshi female no racial discrimination	1.26, 0.32-4.94
Bangladeshi female racial discrimination	2.27, 0.20-25.48
Black Caribbean male no racial discrimination	0.49, 0.12-2.01
Black Caribbean male racial discrimination	3.12, 0.44-22.34
Black Caribbean female no racial discrimination	2.21, 0.85-5.74
<b>Black Caribbean female racial discrimination</b>	<b>19.69, 3.71-104.58</b>

These analyses show that the association between ethnicity and work stress is significant and independent of work characteristics, demographic, occupational and other factors. It also identifies racial discrimination, particularly in combination with gender and ethnicity, as having a powerful influence on work stress. In addition, it

points to Black Caribbean females who have experienced racial discrimination as being most likely to report work stress because of this specific combination of factors.

All the statistical analyses described also included “other” discrimination (i.e. discrimination on other grounds such as age, gender, disability or sexuality). Other types of discrimination were not significantly associated with work stress. This suggests that any influence of other discrimination on work stress is relatively much smaller than that of racial discrimination. Furthermore, it indicates that the association between work stress and racial discrimination is independent of other discrimination, and does not reflect a more generalised concept or perception of discrimination, but rather is a specific and important factor in the experience of work stress.

### *3.3.2.3 Work characteristics and work stress*

This section considers the relationships between work characteristics and work stress, and how they may vary with ethnicity.

First, the work characteristics of each ethnic group at the univariable level were compared.

There were significant differences between the ethnic groups for: control<sup>1</sup> (Whites: mean=32.79, sd=6.90; Black Caribbeans: mean=31.21, sd=6.88; Bangladeshis: mean=29.68, sd=6.76;  $p=0.02$ ); as well as shift-work (17% of Whites often or sometimes worked shifts, compared to 29% of Black Caribbeans and 33% of Bangladeshis,  $p<0.0001$ ); and long or unsociable hours (45% of Black Caribbeans often or sometimes work long or unsociable hours compared to 38% of Bangladeshis and 32% of Whites,  $p=0.03$ ). There were no significant differences for extrinsic effort, intrinsic reward, effort reward imbalance, job demand, total support, night-work or noise.

This suggests very few work characteristics differences between the ethnic groups. The differences relating to control and working patterns (such as shift work and working hours) probably reflect occupational differences between the groups. Categorising respondents occupations into major occupational groups showed that among Whites the most common jobs were: clerical (15%), managerial (13%), associate professional

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<sup>1</sup> High score = more control (i.e. high score is better).

(13%), and science or engineering professional (11%). Among Bangladeshis they were: catering (19%), sales (15%), routine or road transport operative (12%), and clerical (11%); and among Black Caribbeans they were: clerical (13%), associate health or social welfare professional (11%), routine or road transport operative (9%), and managerial (9%) (see Appendix 1 Table 5).

From the follow-up interviews it was clear that participants' narrative around work stress fit the Karasek and Siegrist frameworks of work stress fairly well (see Table 7).

**Table 7**  
**Participants' definitions of stress and their correspondence with Karasek and Siegrist work characteristics**

Work characteristics	Examples of participants definitions of work stress
Job demand	<i>"difficulties in meeting deadlines"</i>
Control	<i>"not being able to say 'no'"</i>
Support	<i>"having a not listening line manager"</i>
Extrinsic effort	<i>"too many [work] hassles"</i>
Intrinsic effort	<i>"having too much responsibility and not enough time"</i>
Reward	<i>"not enough rewards"</i>

Again, these comments support the measurement of work characteristics using these models and their subscales and suggest that they are accessing meaningful concepts.

Comparisons were then made of the associations between work characteristics and work stress before and after the inclusion of ethnicity in the model (see Table 8). These analyses show that higher effort reward imbalance, greater job demand, and less control over work are all associated with work stress. In addition, they show that these associations are virtually unchanged by the inclusion of ethnicity in the analyses. This suggests that there is very little influence of ethnicity over the relationships between work stress and work characteristics, and that they are similar for each ethnic group.

**Table 8**  
**Associations between work stress and work characteristics before and after the inclusion of ethnicity**

Work characteristics	Excluding ethnicity df, p OR, CI	Including ethnicity df, p OR, CI
Low effort reward imbalance*	1, 0.005 1.00	1, 0.01 1.00
High effort reward imbalance	2.91, 1.39-6.09	2.63, 1.23-5.65
Low job demand**	1, 0.004 1.00	1, 0.004 1.00
High job demand	2.84, 1.39-5.82	2.94, 1.41-6.15
Low control***	1, 0.04 1.00	1, 0.04 1.00
High control	0.51, 0.27-0.98	0.49, 0.26-0.96

\* Effort reward imbalance: high score = poorer balance between effort and reward (i.e. high score is worse). \*\* Job demand: high score = more demand (i.e. high score is worse). \*\*\* Control: high score = more control over work (i.e. high score is better).

Tables 4 and 6 in Appendix 1 show the other factors associated with work stress both with and without the inclusion of ethnicity in the analyses. In each case both higher neuroticism and higher income are associated with work stress. Again, this suggests similar profiles of associations with work stress across ethnic groups. In addition, the pattern of association between work stress and both racial discrimination and gender was clear in the model excluding ethnicity, with females who had experienced racial discrimination being most likely to report work stress (OR=10.13 (3.40-30.22)). This highlights the influence of racial discrimination, particularly in combination with gender, on work stress.

The findings relating to work stress are also reflected in the follow-up in-depth interview data. These data suggest some differences in the labelling and meaning of work stress between the ethnic groups. Bangladeshi participants typically perceived work stress in terms of pressure at work (N=6) and working hours (N=3). Black Caribbean participants spoke of work stress more in terms of difficult work relationships with managers (n=7) and poor work morale and climate in general (n=6):

*“I can’t talk to my line manager, she speaks down to me...not feeling appreciated...not counted as part of staff, really stresses me out” (Black Caribbean females, aged 52).*

It also emerged that the Bangladeshi participants saw work as more functional, separate and with limited scope for developing friendships, while the Black Caribbean participants expected deeper and more meaningful relationships in their workplace. These different expectations of work may, in part, reflect the groups’ very different migration histories and are possibly related to the type of occupation selected.

These follow-up data also clearly indicated that Black Caribbean participants reported the highest levels of discrimination (N=8, 6 female and 2 male) compared to both Bangladeshis (N=4, 3 female and 1 male), and Whites (none, despite being selected on the basis of having reported discrimination in the first phase interview). How they experienced discrimination and the meaning they placed on it varied. Some made confused or paradoxical statements, for example:

*“I don’t think it’s me being Black that is the cause of stress or causes me stress but the fact that there aren’t enough people of colour [at work]” (Black Caribbean female, aged 37).*

There is a paradoxical element to this response: on the one hand the person is saying that it is not their Black racial identity that leads to stress but that there are too few Black others at work. The paradox arises because their feelings of being Black or different make them feel uncomfortable, devalued and excluded at work. Others reported overt racist attitudes, behaviours and practices at work. For example:

*“They [employer and senior managers] treat White staff differently....better than Black staff” (Black Caribbean female, aged 47);*

*“There’s not much promotion so to speak” (Black Caribbean female, aged 22);*

*and “I remember once one of the managers went to me ‘why don’t you go up to the cotton fields?’ and I am not the first one he’s said that to. I was totally appalled and thought what’s that got to do with anything? And they say other stuff like that” (Black Caribbean female, aged 22).*

As findings from both interview phases indicated an association between ethnicity and stress, in particular for Black Caribbean females, the in-depth follow-up interviews with

the 6 Black Caribbean women were subjected to more detailed analyses. These suggested that they were highly motivated, had high job aspirations, and performed well, but that this allowed them to give less to their children and families and so damaged their home life. This resulted in stresses from the tension between carer and parent duties and work demands (or higher education studies undertaken to improve work prospects). Over commitment in the face of limited job opportunities and higher unemployment rates among Black Caribbean people may explain this.

The follow-up data, however, should not be interpreted as showing that only Black Caribbean females talked about stress and discrimination in these in-depth interviews. A Black Caribbean male, aged 20, commented

*“I was never in it [a job] long enough to have that bit [discrimination] ... I’ve always been someone on the outside;*

This illustrates coping with discrimination by giving little commitment to a job in order to avoid hurt and to survive, ultimately leading to isolation. Bangladeshi respondents also talked about both the lack of equal opportunities at work:

*“Because we’re Bengali, they [White people] treat us differently. We give them the respect but they don’t give us the respect that we should get. They think oh she’s Bengali and we can treat her like anything” (Bangladeshi female, aged 26);*

as well as how their religion provoked work difficulties:

*“So you can’t go anywhere wearing your scarf. They look at me and think ‘what the heck is that?’ ... do feel a bit of the odd one out” (Bangladeshi female, aged 19).*

#### 3.3.2.4 Analyses of the Bristol and Cardiff data

The Bristol and Cardiff datasets were analysed following the same procedure as closely as possible. Some of the variables were not present in these data, e.g. negative affect, so these confirmatory analyses do not represent an exact replication. However, they do also suggest an association between ethnicity and work stress. In particular Black Caribbean women (and White women) were more likely to suffer from stress.

The association with Black Caribbean women who reported discrimination was not significant: this is probably because this group was so small (N=4).

Overall, the confirmatory analyses of the Bristol and Cardiff datasets supported the current study's findings, and show an association between work stress and ethnicity. This adds weight to the current study's findings, suggesting that they are less likely to be due to chance, and are more likely to be generalisable.

#### *3.3.2.5 Ethnicity and general stress*

A further set of analyses (within the newly collected data set) was carried out to compare the association between ethnicity and work stress with ethnicity and general stress. The same analysis format was followed.

Overall, 14% of respondents reported finding life in general very or extremely stressful. At this univariable level there was no association between ethnicity and general stress: proportions were 10% among Whites, 13% among Bangladeshis, and 17% among Black Caribbeans.

Following multivariable analyses on the sample as a whole, there was no significant association between ethnicity and general stress.

These comparative analyses suggest that the association between ethnicity and work stress is specifically related to work, and does not reflect an association between ethnicity and a more generalised concept and perception of stress.

#### **3.3.3 Summary Of Ethnicity And Work Stress**

1. There was an independent association between ethnicity and work stress.
2. Racial discrimination, in combination with both gender and ethnicity, was powerfully influential in work stress. As a result Black Caribbean females who had experienced racial discrimination were most likely to report high work stress.
3. These findings were specific to work stress, and so are unlikely to represent a generalised increased reactivity to stress.

4. Work stress was also associated with particular work characteristics: higher effort reward imbalance, higher job demand and less control over work.
5. Associations (of work characteristics and other factors) with work stress were similar for all ethnic groups.

### 3.4 ETHNICITY AND PSYCHOLOGICAL DISTRESS

#### Key Findings

- There was an association between ethnicity and psychological distress.
- There was also a strong association between psychological distress and work stress.
- Therefore, groups more likely to report work stress (such as those who had experienced racial discrimination), were correspondingly more likely to suffer psychological distress.
- There were also independent associations between particular work characteristics and psychological distress: higher extrinsic and intrinsic effort, and lower reward and total support. These associations were similar for the ethnic groups.

This section focuses on ethnicity and psychological distress. It is structured and presented in the same way as the previous section on work stress.

#### 3.4.1 Secondary Analyses Of Existing Datasets

##### 3.4.1.1 Univariable association between ethnicity and psychological distress

Psychological distress was measured using the General Health Questionnaire (GHQ). Those with a score over 4, the clinical cut-point, were compared with those scoring less.

The proportion of respondents with psychological distress was very similar in each ethnic group (25%, n=2048 among Whites; 24%, n=17 among South Asians; and 23%, n=19 among Black Caribbeans) (see Appendix 2 Table 2). There was no significant



association between ethnicity and psychological distress ( $p=0.91$ ) (see Appendix 2 Table 3).

This suggests no significant association between ethnicity and psychological distress. However, these analyses do not take account of any other potentially confounding factors.

### **3.4.2 Analysis Of New Data Collected During The Interview Survey**

#### *3.4.2.1 Univariable association between ethnicity and psychological distress*

Overall 23% of respondents were psychologically distressed. This is slightly lower than for the combined Bristol and Cardiff datasets. Proportions of distressed respondents were very similar for each ethnic group (23%,  $n=48$  for Whites; 24%,  $n=47$  for Bangladeshis; and 22%,  $n=44$  for Black Caribbeans) (see Appendix 1 Table 7). Again there was no significant association between ethnicity and psychological distress ( $p=0.90$ ) (see Appendix 1 Table 8).

Similarly, this suggests no association between ethnicity and psychological distress prior to the inclusion of other potentially influential factors.

#### *3.4.2.2 Ethnicity and psychological distress*

As before, analyses were carried out to consider whether the influence of ethnicity changes when other factors are controlled for (see Appendix 1 Analysis Strategy section and Table 9) for a full description of the analysis strategy).

These analyses suggest a significant association between ethnicity and psychological distress. White males who had experienced discrimination, and both white and Bangladeshi females who had not, were more likely to suffer psychological distress (see Table 9 below, and Appendix 1 Table 10 for full details).

**Table 9**  
**Association between psychological distress and ethnicity**

Ethnicity stratified by racial discrimination and sex	df, p OR, CI
	11, 0.04
White male no racial discrimination	1.00
<b>White male racial discrimination</b>	<b>8.12, 1.35-48.74</b>
<b>White female no racial discrimination</b>	<b>2.58, 1.13-5.88</b>
White female racial discrimination	6.52, 0.61-69.65
Bangladeshi male no racial discrimination	1.22, 0.52-2.86
Bangladeshi male racial discrimination	0.79, 0.08-7.61
<b>Bangladeshi female no racial discrimination</b>	<b>3.78, 1.47-9.72</b>
Bangladeshi female racial discrimination	1.57, 0.14-17.18
Black Caribbean male no racial discrimination	0.86, 0.31-2.36
Black Caribbean male racial discrimination	0.34, 0.04-3.31
Black Caribbean female no racial discrimination	1.65, 0.73-3.73
Black Caribbean female racial discrimination	2.91, 0.65-12.95

The lack of association between ethnicity and psychological distress before other factors were included in the analysis, coupled with an association following their inclusion, suggests a strong influence of another factor on the relationship between ethnicity and psychological distress. The further analyses carried out to consider the associations between psychological distress and other factors both with and without including ethnicity shed some light (see Appendix 1 Tables 10 and 11). They showed that when ethnicity was excluded both gender and racial discrimination were linked to psychological distress, with females who had experienced racial discrimination being most likely to suffer psychological distress (OR=3.05 (1.04-9.98)). This, together with the clear association in both analyses between psychological distress and work stress, suggests that the association between ethnicity and psychological distress may reflect vulnerability linked to work stress and racial discrimination.

#### *3.4.2.3 Work characteristics and psychological distress*

Again, the relationships between work characteristics and psychological distress were explored before and after controlling for the influence of ethnicity. There were associations between psychological distress and extrinsic effort, intrinsic effort, reward

and total support. These were not altered by the inclusion of ethnicity in the analyses (see Table 10).

**Table 10**  
**Associations between psychological distress and work characteristics before and after the inclusion of ethnicity**

Work characteristics	Excluding ethnicity df, p OR, CI	Including ethnicity df, p OR, CI
Low extrinsic effort*	1, 0.005 1.00	1, 0.005 1.00
High extrinsic effort	2.13, 1.26-3.59	2.15, 1.26-3.66
Low intrinsic effort**	1, 0.01 1.00	1, 0.04 1.00
High intrinsic effort	1.90, 1.14-3.17	1.75, 1.03-2.98
Low reward***	1, 0.001 1.00	1, 0.001 1.00
High reward	0.44, 0.26-0.73	0.42, 0.25-0.71
Low total support****	1, 0.002 1.00	1, 0.006 1.00
High total support	0.47, 0.29-0.76	0.50, 0.30-0.82

\*Extrinsic effort: high score = more effort (i.e. high score is bad). \*\*Intrinsic effort: high score = more effort (i.e. high score is bad). \*\*\*Reward: high score = high reward (i.e. high score is good). \*\*\*\*Total support: high score = high support (i.e. high score is good).

These analyses suggest some significant associations between psychological distress and work characteristics. They also suggest that these associations do not vary with ethnicity.

Further comparisons were made of the associations between psychological distress and other factors before and after including ethnicity in the analyses (see Tables 10 and 11 in Appendix 1). There were associations with less frequent shift-work, more frequent long or unsociable hours, more frequent high background noise levels, manual work, and high work stress, as well as gender and racial discrimination. Again these associations were virtually unchanged by the inclusion of ethnicity, suggesting that the profile of factors associated with psychological distress is very similar for each ethnic

group. The analyses also clearly highlight the strong influence of racial discrimination, as well as work stress (and other work characteristics) on mental health.

The link between work stress and psychological distress was also apparent from the follow-up in-depth interview data. Participants described responses to stress including:

*“feeling uptight”, “harder to relax”, “my eating habits, when I get stressed I don’t eat”, “thinking about [work-related] things over and over again”, “it’s very depressing”, “feeling distorted”, “not being able to switch off [from work] at home”, “wrecking home relationships”, and “feeling guilty as not spending enough time with family”.*

It was also clear from these data that the effect of work stress on psychological health was similar between the ethnic groups, and this again supports the statistical findings described above.

#### *3.4.2.4 Cultural identity and psychological distress*

Further analyses were carried out to explore the influence of cultural identity. Phinney’s measure of cultural identity (Phinney 1992) was included in the analyses as a continuous mean score. A higher score on Phinney’s measure was associated with a lower risk of psychological distress (OR=0.63 (0.40-0.99),  $p=0.05$ ). Additional exploratory analyses suggested that this association may be attributable in particular to the White group. This may perhaps reflect the need for White respondents to explore identity when they are in the minority.

Berry’s schema (Berry 1997) also showed some associations specific to ethnic groups. Among Bangladeshis, integrated (compared to marginalised) language was associated with psychological distress, as was integrated (compared to traditional) clothing. However, among Black Caribbeans those making traditional clothing choices were more likely to report psychological distress.

Marginalised language (speaking neither the dominant language or own language much) needs careful interpretation. For the Bangladeshi group the association between marginalised language (i.e. preferring to speak neither Bangladeshi languages nor English) and lower risk of psychological distress could reflect measurement error for psychological distress where other languages (such as Arabic or Sylheti) were

preferred. Alternatively, it may indicate that those making integrated language choices are actually at higher risk because this is stressful. Traditional clothing choices among Black Caribbeans (compared with integrated choices) were associated with psychological distress, and may reflect alienation or low self esteem for a conspicuously different group.

These findings emphasise the importance of including culture in research of this nature. They also make it clear that further research is needed to clarify the measurement of culture and the interpretation of findings in this complex area, particularly as the relationship between culture and psychological distress may be specific to ethnic groups to some degree.

#### *3.4.2.5 Analyses of the Bristol and Cardiff data*

Confirmatory analyses were carried out within the Bristol and Cardiff data following the analysis procedure as closely as possible. These analyses showed an association between ethnicity and psychological distress, in particular among White women (who had not experienced discrimination).

This is also broadly supportive of the current study's findings, suggesting that they are less likely to be chance results, and may well be generalisable to some degree.

### **3.4.3 Summary of ethnicity and psychological distress**

1. There was an association between ethnicity and psychological distress.
2. There was also an association between psychological distress and work stress.
3. Therefore, groups more likely to report work stress (such as those who had experienced racial discrimination), were correspondingly more likely to suffer psychological distress.
4. There were also associations between particular work characteristics and psychological distress: higher extrinsic and intrinsic effort, and lower reward and total support. These associations were similar for the ethnic groups.

### 3.5 ETHNICITY AND GENERAL HEALTH

#### **Key Findings**

- There was little variation in poor health with ethnicity.
- Work characteristics had little direct influence on health, and this was similar for the ethnic groups.

Before focussing on general health, some analyses were carried out to assess any associations between ethnicity, work stress and health related behaviours (e.g. smoking, drinking), health service use and sick leave from work.

#### **3.5.1 Health Related Behaviours, Health Service Use And Sick Leave**

Thirty three percent (n=209) of respondents were smokers, 4% (n=26) alcohol dependent, 3% (n=16) drank more than recommended weekly limits (i.e. 14 units per week for women and 21 units per week for men), 48% (n=297) had visited their GP at least once in the last three months, and 9% (n=55) had visited A&E in the last three months.

Multivariable analyses showed no significant associations between work stress and any of these measures. Including these measures in the model did not alter the association between work stress and ethnicity.

This suggests that any association between health related behaviours, health service use and work stress in this population is relatively weaker than that of other factors. These findings should be interpreted with some caution for several reasons: alcohol use is particularly culturally specific (e.g. it was much less widely used by the Bangladeshi population); and the study population was a fairly young working one (mean age 35 years), so their health service use per se was relatively low.

##### *3.5.1.1 Sick leave*

Twenty one percent (n=133) reported taking more than 5 days sick leave in the previous 12 months.

Sick leave was associated with both ethnicity (27% of Black Caribbeans had taken more than 5 days leave, 21% of Whites, and 16% of Bangladeshis,  $p=0.02$ ) and work stress (41% of those with high work stress compared to 19% with low work stress,  $p<0.0001$ ).

Multivariable analyses showed an independent association between work stress and sick leave. This did not alter the association between work stress and ethnicity.

This suggests a link between work stress and sick leave, reflecting the potentially far-reaching consequences of work stress even among this relatively young population with many more working years to come.

From this point on this section focuses on general poor health and again uses the same presentation structure as the previous two sections.

### **3.5.2 Secondary Analyses Of Existing Datasets**

#### *3.5.2.1 Univariable association between ethnicity and general health*

General health was measured using a single item asking “Over the past 12 months, how would you say your general health has been?” Those who responded fair or poor were compared with those who responded excellent, very good or good. Again, this is an arbitrary cut-point selected to allow comparison with previous work (Smith et al 2000a, Smith et al 2004). The rate of poor health was very similar for each ethnic group (4%,  $n=318$  overall; 4%,  $n=309$  for Whites; 5%,  $n=4$  for South Asians; and 6%,  $n=5$  for Black Caribbeans) (see Appendix 2 Table 4). There was no significant association between ethnicity and poor general health ( $p=0.44$ ) (see Appendix 2 Table 5).

This suggests little influence of ethnicity on health, but takes no account of other potentially important factors.

### **3.5.3 Analysis Of New Data Collected During The Interview Survey**

#### *3.5.3.1 Univariable association between ethnicity and general health*

Overall 17% of respondents said their health had been fair or poor over the previous year. This is considerably higher than the combined Bristol and Cardiff datasets. Rates were similar for the three groups, though highest among Black Caribbeans (14%, n=30 for Whites; 16%, n=33 for Bangladeshis; and 20%, n=40 for Black Caribbeans) (see Appendix 1 Table 12). Again, there was no significant association between ethnicity and poor health ( $p=0.29$ ) (see Appendix 1 Table 13).

Similarly, this suggests no strong link between ethnicity and health prior to the inclusion of other factors in the analyses.

#### *3.5.3.2 Ethnicity and general health*

Again, analyses were carried out to consider whether the influence of ethnicity changes when other factors are controlled for (see Appendix 1 Analysis Strategy section and Table 14) for full description of analysis strategy).

There was no significant association between ethnicity and poor health. However, the data suggest a possible trend towards poorer health among the Black Caribbean group, particularly males who had experienced discrimination (see Table 11, and full table of associations in Appendix 1 Table 15).



**Table 11**  
**Association between health and ethnicity**

Ethnicity stratified by racial discrimination and sex	df, p OR, CI
	11, 0.36
White male no racial discrimination	1.00
White male racial discrimination	0.72, 0.11-4.90
White female no racial discrimination	0.73, 0.27-1.93
White female racial discrimination	0.87, 0.11-6.73
Bangladeshi male no racial discrimination	1.97, 0.79-4.91
Bangladeshi male racial discrimination	0.64, 0.06-7.26
Bangladeshi female no racial discrimination	0.19, 0.04-0.97
Bangladeshi female racial discrimination	0.01, 0.00-3410745
Black Caribbean male no racial discrimination	1.31, 0.48-3.57
Black Caribbean male racial discrimination	2.26, 0.35-14.75
Black Caribbean female no racial discrimination	1.30, 0.54-3.11
Black Caribbean female racial discrimination	1.37, 0.29-6.44

There was also a strong link between poorer health and psychological distress (OR=3.09, (1.70-5.61),  $p < 0.0001$ ).

These analyses suggest that any influence of ethnicity on general health is relatively small.

### 3.5.3.3 Work characteristics and health

Again, analyses before and after controlling for the influence of ethnicity were compared. There were no significant associations between work characteristics and health either before or after ethnicity was included in the analyses.

These analyses suggest that any influence of work characteristics on health was relatively small, and that this did not vary with ethnicity.

Higher neuroticism scores, experiencing unfair treatment at work, fewer educational qualifications, and psychological distress were all associated with poor health. These associations were virtually unchanged by the inclusion of ethnicity in the analyses (see

Appendix 1 Tables 15 and 16). Again this suggests a very similar profile of associations for each ethnic group.

The association between health and psychological distress established in this section, and that between psychological distress and work stress established in the previous section, suggest that the potential for work to influence health is apparent. It may be that it would only be found in a rather older working population than this one. If this were to be the case, then the possibility of an increased impact among those more likely to suffer work stress, which is associated with ethnicity, cannot be ruled out.

As with psychological distress, participants in the follow-up in-depth interviews clearly identified physical responses to stress, such as:

*“headaches, I keep getting headaches”, “worn out”, and “fidgety”.*

Again, these data showed that such responses were similar between the ethnic groups. This supports the statistical finding of no significant association between ethnicity and poor general health. It also clearly underlines the detrimental impact of stress on health.

#### *3.5.3.4 Analyses of the Bristol and Cardiff data*

Confirmatory analyses of the Bristol and Cardiff data suggest no significant association between ethnicity and poor health. This supports the current study's findings.

#### **3.5.4 Summary Of Ethnicity And General Health**

1. There was little variation in poor health with ethnicity.
2. Work characteristics had little direct influence on health, and this was similar for the ethnic groups.

## **4. DISCUSSION**

### **4.1. ETHNICITY AND OCCUPATIONAL STRESS**

The first aim of the present research was to investigate the prevalence of reported occupational stress in Black Caribbean, Asian and White workers. After controlling for demographic and occupational factors there was a significant association between ethnicity and work stress. In addition, racial discrimination, particularly in combination with gender and ethnicity, was identified as having a strong influence on perceived stress at work. Black Caribbean females who had experienced racial discrimination were most likely to report high levels of stress at work. This was supported by the qualitative follow up, which also showed high levels of motivation among Black Caribbean women who were often prioritising work demands over domestic demands. The association was specific to racial discrimination and did not reflect other types of interpersonal harassment.

### **4.2 WORK CHARACTERISTICS, PERCEIVED STRESS AND PSYCHOLOGICAL DISTRESS**

A second aim of the research was to determine whether associations between work characteristics and perceived stress varied as a function of ethnicity. The results replicated well-established associations: high effort reward imbalance, greater job demand and lower control over work were associated with greater stress. These effects, and the profile of other factors associated with stress, were similar in the three ethnic groups.

There was a significant association between ethnicity and psychological distress, which reflected a link between work stress and psychological distress (i.e. those who were more likely to report work stress were more likely to suffer psychological distress). These results were strongly supported by the follow up qualitative study. Reporting work stress may indicate a perception of psychological symptoms attributed to work. In this model work stress may be viewed as an intermediate stage between isolated psychological symptoms and common mental disorder such as depressive or anxiety disorders. Alternatively, those with existing psychological distress may be more likely to

perceive the workplace as stressful and report work stress. In this cross sectional data it is difficult to be certain of the direction of causation.

There were also associations between work characteristics and psychological distress. In the overall sample high support from colleagues and supervisors was protective of mental health. This replicates the results of previous studies that have found that support at work is related to good mental health in both cross sectional (Bromet et al 1992, Weinberg and Creed 2000) and longitudinal studies (Parkes et al 1994, Kawakami et al 1992, Niedhammer et al 1998, Stansfeld et al 1999a). Conversely, high extrinsic effort, a measure of job demands, was related to increased risk of psychological distress; again this is similar to findings in previous studies of job characteristics and psychological distress where high job demands have been related to psychological distress in both cross sectional (Broadbent 1985, Estryng-Behar et al 1990, Bromet et al 1992) and longitudinal studies (Kawakami et al 1992, Parkes et al 1994, Stansfeld et al 1997, Niedhammer et al 1998, Mino et al 1999, Stansfeld et al 1999a).

In general, decision latitude is less strongly associated with mental health but high levels of decision latitude have been found to be protective of mental health in both cross sectional (Hesketh and Shouksmith 1986, Warr 1990, Mausner-Dorsch and Eaton 2000) and longitudinal studies (Niedhammer et al 1998, Stansfeld et al 1999a). Decision authority, rather than skill discretion was found to be the strongest predictor of depression. In our study Black Caribbean women showed most effects of low control on psychological distress. The associations were less strong between work characteristics and poor health than between work characteristics and psychological distress. Most previous studies in this area have examined coronary heart disease or mortality (Bosma et al 1997, Kivimaki et al 2003). Most of these studies have found relationships with low control or decision latitude but some have found low social support at work to predict physical ill health (Orth-Gomer and Johnson 1987), as in this study. Effort-reward imbalance is also a powerful predictor of coronary heart disease and poor health functioning (Siegrist 1996, Bosma et al 1998, Stansfeld et al 1998).

### **4.3 ETHNICITY AND GENERAL HEALTH**

Self-reported health status is largely a measure of physical health but, in fact, has been also strongly related to mental health in previous studies (Stansfeld et al 1993). Thus

the overlap in content may partly explain the associations between poor health and psychological distress. However, poor health and psychological distress are often associated. Usually, psychological distress is a consequence of the pain, disability or limitations of physical illness. Sometimes psychological distress may be a precursor of physical illness. The differential pattern of associations between risk factors such as work characteristics and the two health outcomes suggests that they are not tapping the same health constructs. Indeed, there was no effect of ethnicity on reports of general health, which may also reflect the fact that the sample had a large percentage of younger workers.

#### **4.4 NEW ISSUES**

The present research was largely based on the strategy of using techniques that had been developed with White workers and investigating whether similar or different effects were observed as a function of ethnicity. In parallel with this, the research made a preliminary attempt to address the problems associated with conceptualising ethnicity and culture, and the meaning of discrimination in work settings. The findings suggest that further research on these topics is desirable. Methods to evaluate experiences of discrimination in the workplace, and their impact on health outcomes, warrant further research evaluation and data to provide a process that can be adopted in work settings to facilitate the progressive management of discrimination and adverse health outcomes. We also assessed how cultural identity may influence psychological distress. This was an innovation in the project, and showed some important trends that require replication in larger samples.

#### **4.5 LIMITATIONS OF THE PRESENT PROJECT**

The cross sectional design was a major limitation of the study limiting inferences that can be drawn linking cause and effect. The response rate was lower than ideal but there is no reason to suspect that the samples were not representative of the ethnic groups within the study. Ideally the numbers could have been larger within each ethnic group to derive odds ratios with narrower confidence limits but the necessity to rely on a more intensive interview methodology rather than self-report questionnaires meant that we were constrained in the number of interviews we could complete by financial and time limits. In order to carry out the study in a methodologically economic way we focused our sampling on a geographically restricted area of east London. This ensured

that we sampled from areas densely populated by our selected ethnic groups. This meant that, although our results may be generalisable to other socially deprived inner city areas, we cannot be certain that they generalise to other areas in the UK. However, the secondary analyses of the questionnaire data from the Bristol and Cardiff studies supported many of the findings from the interviews. Additionally, in order to obtain sufficient numbers we focused on three ethnic groups and further work would need to be done to extend the findings to other ethnic groups. Nevertheless, the findings that are common to all groups, such as the pattern of associations between work characteristics and work stress or discrimination and work stress, make it likely that these might be found universally across ethnic groups. Also, several US studies show that ethnic minorities experience a more negative work environment in terms of criticism, bias and sexual harassment that can lead to stress (Szczepura et al 2004). US research in gender and cultural diversity issues in worksite stress indicates the need for stress management programmes to enable women in general, and ethnic minority women specifically, to cope with their unique stressors (Walcott-McQuigg 1994).

In general the qualitative study provided support for many of the major points raised by the main study. However, response rate was also a problem in this phase. The emotive nature of racism and the lack of ease with discussion of racism probably underlay the high refusal rate for this phase of the study. This illustrates the difficulties of encouraging and facilitating participation in a study in this area, even when a certain amount of pre-existing trust can be assumed from the participant-interviewer relationship established during the initial study interview.

The responses to this phase also reflect how racial discrimination may exist but may not be self-evident or readily talked about. The participants talked freely about stresses at work. And, in talking about work, problems of equity and equal opportunity were referred to on some occasions. However, when asked about racism or ethnicity as a stressor, the responses were conspicuously curtailed. Asking about stress being related to ethnicity was, with hindsight and despite all the preparatory parts of the interview, a more threatening question than had been anticipated. In addition, respondents were often surprised by the open racial or ethnic line of enquiry. This suggests that other sorts of attributions for stress at work were more obviously and easily available, even when ethnicity was relevant. Indeed, even some respondents who alluded to ethnicity, or a lack of equal opportunity, denied any personal

experience, although they frequently gave accounts of others being subjected to racial discrimination. Participants were clearly grappling with the idea that they had been discriminated against, and perhaps the more direct questions risked undermining the self-esteem or identity of individuals who do not like to see themselves as victims but as having a good working relationship with colleagues whom they meet on a daily basis. This may make a discriminatory attribution of stress more difficult to apply or sustain at an individual level.

Managers were specifically highlighted as sources of discrimination, and it was quite clear that workers knew that such unfair work practices significantly limited their work potential. For example:

*“the senior managers are quite racist ... unsupportive”* (**Black Caribbean female, aged 47**);

and *“sometimes it’s because of their ethnic group. Sometimes it’ll be because of just a perception they [managers] got of that person or something like that”* (**Black Caribbean female, aged 22**).

#### **4.6 INTERPRETATION OF RESULTS**

The aim of the qualitative phase of the project was to find out how work stress, ethnicity, discrimination and health are experienced and understood by the study sample. It has been shown that Black Caribbean women reported the most experiences of discrimination at work. This manifested in verbal racial abuse, unfair work practices, and being less valued by management (including racist managers). It led to feelings of confusion, rejection and isolation, and being devalued, guarded and ignored. The Bangladeshi sample reported discrimination at work connected to their religious practices and feelings of not belonging and being devalued at work because of their ethnicity. Experiences of discrimination and work stress led to psychological, physical and social distress. The conflict between the impact of discrimination at work and participants’ essential coping was striking:

*“these sorts of problems [discrimination] always occur. It’s been happening all my life, so it doesn’t really, it’s something not new to me ... it doesn’t affect us because it’s everyday life”* (**Bangladeshi female, aged 26**);

and *“it does hurt [being discriminated against], but I’ve got used to it now”* (**Black Caribbean female, aged 52**).

#### **4.7 IMPLICATIONS FOR GUIDANCE**

There has been very little research on ethnicity and occupational health, and even less on discrimination experiences, cultural identity and health outcomes among workers. The present project has advanced our knowledge of the area but further research is required. The results obtained here suggest the global approach that must be adopted, but at the same time this must retain the capacity to address issues that are unique to any single ethnic group. Employers need to consider how ethnicity affects their workers and foster greater responsibility to manage it. How work performance is affected by workplace discrimination also needs to be considered and minimum standards of work practice put into place. These should involve the acknowledgement and inclusion of all ethnic groups and cultural issues in all work practices and procedures. Managing differences between ethnic groups at work could be facilitated by talking about culture sensitively with all employees at all organisational levels. Employers managing a diverse ethnic workforce need to keep ethnicity in mind. These views are expressed in the HSC Strategic Plan which requires HSE to “pay particular attention to the needs of ethnic minorities in developing programmes”. Similarly, the Race Relations Amendment Act (2000) requires all public bodies to take account of the needs of the population they serve. The best ways to achieve these aims require further investigation. There is, for example, a lack of evidence on ethnicity and stress awareness/management programmes and without this it is difficult to promote good practice in this area. Race equality statements that include mechanisms to address discrimination in the workplace may be a sign of high quality in healthy employment practice.

Usually many new approaches are based on data collected from mainly White workers. However, it is important to ensure that such practices and findings are effective and relevant for other ethnic groups. This has been done here and the results generally support the view that the Management Standards approach adopted by HSE will probably be applicable to ethnic minorities. However, a mature application of these management standards for effectiveness in a multi-cultural workforce is largely untested. These data do suggest more attention needs to be paid to the transfer of practices and policies across ethnic groups, albeit that these details can be incorporated within an overall race equality and management standards framework. In



parallel with this type of approach it is essential to consider different conceptualisations of ethnicity and culture, and the interplay of mixed and single cultural work environments. This has been initiated here and further research is needed on these topics. Indeed, more research is required to examine causality and to aid interpretation of some of the basic results obtained here.

#### **4.8 FURTHER RESEARCH**

One approach could be to ensure that any occupational health and safety policy has been evaluated across ethnic groups. An alternative approach would be a greater incorporation of racial issues into more general approaches. For example, the impact of racial discrimination needs to be contrasted with other risk factors for stress. Longitudinal studies will clearly aid our knowledge of the development of occupational stress and we urgently require data on this issue in those starting work. Such approaches can be used to develop our general knowledge of ethnicity and occupational health and also to focus on high priority topics identified in the present project (racial discrimination against women, especially Black Caribbean women).

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# **APPENDIX 1**

## **Analyses of the data newly collected at the first phase interview**

### **A1.1 Ethnicity and work stress**

Table 1 describes the factors considered in these analyses, and their measurement.

**Table 1**  
**Variables in the analyses**

Factor	Measurement
<b>Ethnicity</b>	
Simple	Three ethnic groups were compared: White (UK born), Bangladeshi, and Black Caribbean.
Stratified by sex and racial discrimination	Each ethnic group sub-divided by both sex and racial discrimination, resulting in 4 strata for each ethnic group (12 in all): male & no racial discrimination; male & racial discrimination; female & no racial discrimination; female & racial discrimination.
<b>Main outcome measures</b>	
Work stress	Single item asking "In general, how do you find your job?": those responding not at all, mildly and moderately stressful were compared with those responding very or extremely stressful.
Psychological distress	General Health Questionnaire (GHQ) (Goldberg 1972): those scoring 4 or less were compared with those with higher scores.
General health	Single item asking "Over the past 12 months, how would you say your general health has been?": those responding excellent, very good and good were compared with those responding fair or poor.
<b>Demographic</b>	
Age	Split into quartiles.
Sex	Males and females were compared.
Marital status	Those who were married or cohabiting were compared with those who were single (never married), divorced / separated, or widowed.
Income	Split into 4 bands: under £10k pa, £10<£20k pa, £20<£30k pa, £30k+.

**Table 1 continued**

Education	Split into 4 bands: no qualifications, up to O level / GCSE, up to A level, further.
<b>Personality</b>	Negative affect (Eysenck 1988) split into quartiles.
<b>Other</b>	
Racial discrimination	Those who reported discrimination on the basis of race or ethnicity were compared with those who did not.
Other discrimination	Those who reported discrimination on other grounds (such as age, class, disability, gender, religion or sexuality) were compared with those who did not.
Smoking	Non-smokers and smokers were compared.
<b>Occupational</b>	
Full-time part-time work	Those who worked full-time (30 hours per week or more) were compared with those who worked part-time (up to 30 hours per week).
Contract	Those with permanent contracts were compared with those with temporary, casual or fixed term contracts.
Position	Those who were employees were compared with managers / supervisors, and the self-employed.
Manual	Those with non-manual occupations were compared with those with manual occupations.

**Table 1 continued**

Unfair treatment	Those who responded no to “Do you feel that you have been treated unfairly at your present place of work, e.g., when applying for promotion?” were compared with those who responded yes.
Ethnic mix	Measured by a single item “In general, what is the predominant ethnic or cultural origin of the people you work with?”: those responding all the same or mostly the same as you were compared with those responding mixed – half and half, and those responding mostly different or all different from you.
<b>Work characteristics</b>	
<i>Siegrist</i>	Siegrist and Peter (2000)
Extrinsic effort	Situational factors which make work more demanding: median split.
Intrinsic effort	Personal factors (such as motivation and commitment to work): median split.
Reward	Pay, status and opportunities for advancement: median split.
Effort reward imbalance	Ratio of effort and reward: median split.
<i>Karasek</i>	Karasek et al (1998)
Job demand	Pace and intensity of work: median split.
Control	Control the worker as over work and the skill and variety involved: median split.
Total support	Support from colleagues and superiors: median split.



**Table 2**  
**Work stress by ethnic group**

Ethnic group	Low work stress	High work stress	Total
	N (%)	N (%)	N (%)
White	191 (89)	24 (11)	215 (100)
Bangladeshi	184 (92)	17 (8)	201 (100)
Black Caribbean	165 (82)	37 (18)	202 (100)
Total	540 (87)	78 (13)	618 (100)

### **Analysis Strategy**

Analyses were carried out in three stages corresponding to the factors being considered:

1. Demographic, personality and other factors
2. Occupational factors
3. Work characteristics.

Within each stage, four steps were taken:

- a) univariable associations between ethnicity and each factor being considered;
- b) univariable associations between work stress and each factor being considered;
- c) univariable associations between work stress and each factor being considered *sub-divided* by ethnicity
- d) multivariable associations between work stress, ethnicity, and all the factors being considered.

At the end of stages 1 and 2 above any factors found to be independently associated with work stress during the analyses in step d) were included in the multivariable analyses of the following stage.

After completing these steps, the final model was repeated excluding ethnicity, to allow the comparison of associations and assess any variation with ethnicity.

**Table 3**  
**Summary of ethnicity and work stress analyses**

<b>Stage 1. Demographic, personality and other factors</b>		
<u>Step d). Multivariable analyses</u>		
<b>Factors included in the analyses</b> ➔		<b>Factors identified as independently associated with work stress &amp; therefore to be included at Stage 2</b>
<b>Demographic</b>	Age, Sex, Marital status, Income, Education	Negative affect, Income
<b>Personality</b>	Negative affect	
<b>Other</b>	Racial discrimination, Other discrimination	
<b>Stage 2. Occupational factors</b>		
<u>Step d). Multivariable analyses</u>		
<b>Factors included in the analyses</b> ➔		<b>Factors identified as independently associated with work stress &amp; therefore to be included at Stage 3</b>
<b>Occupational</b>	Full-time, Contract, Position, Manual, Occupation, Unfair treatment, Ethnic mix	Ethnic mix, Negative affect, Income
<b>Identified at Stage 1, step d</b>	Negative affect, Income	

Table 3 continued

<b><u>Stage 3. Work characteristics</u></b> <b><u>Step d). Multivariable analyses</u></b>		
<b>Factors included in the analyses</b> ➡		<b>Factors identified as independently associated with work stress</b>
<b>Work characteristics</b>	<b>Siegrist</b> Extrinsic effort, Intrinsic effort, Reward, Effort reward imbalance <b>Karasek</b> Job demand, Control, Total support <b>Conditions</b> Night-work, Shift-work, Long/unsociable hours, Noise	Effort reward imbalance, Job demand, Control, Negative affect, Income
<b>Identified at Stage 2, step d</b>	Ethnic mix, Negative affect, Income	

**Table 4**  
**Associations with work stress including ethnicity: full table supporting Table 6**

	df, p OR, CI
White male no racial discrimination	11, 0.007 1.00
White male racial discrimination	1.75, 0.27-11.54
White female no racial discrimination	0.78, 0.26-2.34
White female racial discrimination	4.05, 0.54-30.38
Bangladeshi male no racial discrimination	0.71, 0.21-2.38
Bangladeshi male racial discrimination	0.45, 0.04-5.03
Bangladeshi female no racial discrimination	1.26, 0.32-4.94
Bangladeshi female racial discrimination	2.27, 0.20-25.48
Black Caribbean male no racial discrimination	0.49, 0.12-2.01
Black Caribbean male racial discrimination	3.12, 0.44-22.34
Black Caribbean female no racial discrimination	2.21, 0.85-5.74
Black Caribbean female racial discrimination	19.69, 3.71-104.58
Low effort-reward imbalance*	1, 0.01 1.00
High effort-reward imbalance	2.63, 1.23-5.65
Low job demand**	1, 0.004 1.00
High job demand	2.94, 1.41-6.15
Low control***	1, 0.04 1.00
High control	0.49, 0.26-0.96
Lowest negative affect	3, 0.005 1.00
2 <sup>nd</sup> quartile	1.15, 0.35-3.70
3 <sup>rd</sup> quartile	2.76, 0.93-8.22
Highest negative affect	4.50, 1.53-13.21

**Table 4 continued**

	3, 0.03
>£10	1.00
£10<£20	4.98, 1.71-14.53
£20<£30	5.26, 1.59-17.34
£30+	3.94, 0.97-15.93

\* Effort reward imbalance: high score = poorer balance between effort and reward (i.e. high score is worse). \*\* Job demand: high score = more demand (i.e. high score is worse). \*\*\* Control: high score = more control over work (i.e. high score is better).

**Table 5  
Major occupational groups by ethnicity**

	Whites	Bangladeshis	Black Caribbeans
Manager	27 (12.5)	6 (3)	18 (9)
Manager/proprietor in service	4 (2)	14 (7)	10 (5)
Science/engineering professional	24 (11)	7 (3)	10 (5)
Teaching professional	16 (7)	4 (2)	6 (3)
Associate health/social welfare professional	8 (4)	4 (2)	23 (11)
Other associated professional	27 (12.5)	12 (6)	7 (3)
Clerical	33 (15)	22 (11)	26 (13)
Trade	13 (6)	7 (3)	16 (8)
Security / protective	3 (1)	6 (3)	6 (3)
Catering	6 (3)	39 (19)	6 (3)
Health & related	4 (2)	4 (2)	11 (6)
Childcare & related	8 (4)	13 (6)	9 (4)
Personal and protective	5 (2)	6 (3)	10 (5)
Sales	6 (3)	30 (15)	12 (6)
Routine process/road transport operative	22 (10)	26 (12)	19 (9)
Other	10 (5)	6 (3)	15 (7)
Total	216 (100)	206 (100)	204 (100)

**Table 6**  
**Associations with work stress excluding ethnicity**

	df, p OR, CI
Male no racial discrimination	3, 0.001 1.00
Male racial discrimination	1.85, 0.55-6.21
Female no racial discrimination	1.90, 0.98-3.66
Female racial discrimination	10.13, 3.40-30.22
Low effort-reward imbalance*	1, 0.005 1.00
High effort-reward imbalance	2.91, 1.39-6.09
Low job demand**	1, 0.004 1.00
High job demand	2.84, 1.39-5.82
Low control***	1, 0.04 1.00
High control	0.51, 0.27-0.98
Lowest negative affect	3, 0.007 1.00
2nd	1.32, 0.42-4.17
3rd	3.02, 1.03-8.82
Highest negative affect	4.35, 1.52-12.48
>£10	3, 0.02 1.00
£10<£20	4.39, 1.63-11.82
£20<£30	4.85, 1.60-14.71
£30+	3.62, 1.00-13.08

\* Effort reward imbalance: high score = poorer balance between effort and reward (i.e. high score is worse). \*\* Job demand: high score = more demand (i.e. high score is worse). \*\*\* Control: high score = more control over work (i.e. high score is better).

## A1.2 Ethnicity and psychological distress

**Table 7**  
**Psychological distress by ethnic group**

Ethnic group	No psychological distress N (%)	Psychological distress N (%)	Total N (%)
White	163 (77)	48 (23)	211 (100)
Bangladeshi	149 (76)	47 (24)	196 (100)
Black Caribbean	155 (78)	44 (22)	199 (100)
Total	467 (77)	139 (23)	606 (100)

**Table 8**  
**Association between psychological distress and ethnic group**

	p OR, CI
White	0.90 1.00
Bangladeshi	1.07, 0.68-1.70
Black Caribbean	0.96, 0.61-1.53

Analyses were carried out using the strategy described above, a summary of which is in Table 9 below.

**Table 9**  
**Summary of ethnicity and psychological distress analyses**

<b><u>Stage 1. Demographic, personality and other factors</u></b> Step c). Multivariable analyses		
<b>Factors included in the analyses</b> ➔		<b>Factors identified as independently associated with psychological distress &amp; therefore to be included at Stage 2</b>
<b>Demographic</b>	Age, Sex, Marital status, Income, Education	
<b>Other</b>	Racial discrimination, Other discrimination, Smoking	
<b><u>Stage 2. Occupational factors</u></b> Step c). Multivariable analyses		
<b>Factors included in the analyses</b> ➔		<b>Factors identified as independently associated with psychological distress &amp; therefore to be included at Stage 3</b>
<b>Occupational</b>	Full-time, Contract, Position, Manual, Occupation, Unfair treatment, Ethnic mix	Contract, Unfair treatment, Manual
<b>Identified at Stage 1, step c</b>		
<b><u>Stage 3. Work characteristics</u></b> Step c). Multivariable analyses		
<b>Factors included in the analyses</b> ➔		<b>Factors identified as independently associated with psychological distress</b>
<b>Work characteristics &amp; Work stress</b>	<p align="center"><b>Siegrist</b>                      Extrinsic effort, Intrinsic effort, Reward, Effort reward imbalance</p> <p align="center"><b>Karasek</b>                      Job demand, Control, Total support</p> <p align="center"><b>Conditions</b>                      Night-work, Shift-work, Long/unsociable hours, Noise</p>	Extrinsic effort, Intrinsic effort, Reward, Total support, Manual, Long/unsociable hours, Noise, Work stress
<b>Identified at Stage 2, step c</b>	Contract, Unfair treatment, Manual	



**Table 10**  
**Associations with psychological distress including ethnicity: supporting Table 9**

	df, p OR, CI
White male no racial discrimination	11, 0.04 1.00
White male racial discrimination	8.12, 1.35-48.74
White female no racial discrimination	2.58, 1.13-5.88
White female racial discrimination	6.52, 0.61-69.65
Bangladeshi male no racial discrimination	1.22, 0.52-2.86
Bangladeshi male racial discrimination	0.79, 0.08-7.61
Bangladeshi female no racial discrimination	3.78, 1.47-9.72
Bangladeshi female racial discrimination	1.57, 0.14-17.18
Black Caribbean male no racial discrimination	0.86, 0.31-2.36
Black Caribbean male racial discrimination	0.34, 0.04-3.31
Black Caribbean female no racial discrimination	1.65, 0.73-3.73
Black Caribbean female racial discrimination	2.91, 0.65-12.95
Low extrinsic effort*	1, 0.005 1.00
High extrinsic effort	2.15, 1.26-3.66
Low intrinsic effort**	1, 0.04 1.00
High intrinsic effort	1.75, 1.03-2.98
Low reward***	1, 0.001 1.00
High reward	0.42, 0.25-0.71
Low total support****	1, 0.006 1.00
High total support	0.50, 0.30-0.82
Never/seldom shift-work	1, 0.09 1.00
Sometimes/often shift-work	0.59, 0.32-1.08
Never/seldom long/unsociable hours	1, 0.02 1.00
Sometimes/often long/unsociable hours	2.02, 1.15-3.55

**Table 10 continued**

Never/seldom noise	1, 0.04
Sometimes/often noise	1.00
	1.75, 1.02-3.01
Non-manual	1, 0.04
Manual	1.00
	1.72, 1.04-2.86
Low work stress	1, 0.005
High work stress	1.00
	2.63, 1.35-5.12

\*Extrinsic effort: high score = high effort (i.e. high score is bad). \*\*Intrinsic effort: high score = high effort (i.e. high score is bad). \*\*\*Reward: high score = high reward (i.e. high score is good). \*\*\*\*Total support: high score = high support (i.e. high score is good).

**Table 11**  
**Association with psychological distress excluding ethnicity**

	df, p
	OR, CI
Male no racial discrimination	3, 0.01
Male racial discrimination	1.00
Female no racial discrimination	1.47, 0.51-4.24
Female racial discrimination	2.23, 1.33-3.74
	3.05, 1.04-8.98
Low extrinsic effort*	1, 0.005
High extrinsic effort	1.00
	2.13, 1.26-3.59
Low intrinsic effort**	1, 0.01
High intrinsic effort	1.00
	1.90, 1.14-3.17
Low reward***	1, 0.001
High reward	1.00
	0.44, 0.26-0.73
Low total support****	1, 0.002
High total support	1.00
	0.47, 0.29-0.76

**Table 11 continued**

Never/seldom shift-work	1, 0.04
Sometimes/often shift-work	1.00 0.54, 0.30-0.98
Never/seldom long/unsociable hours	1, 0.02
Sometimes/often long/unsociable hours	1.00 1.92, 1.11-3.34
Never/seldom noise	1, 0.06
Sometimes/often noise	1.00 1.66, 0.98-2.81
Non-manual	1, 0.02
Manual	1.00 1.78, 1.09-2.89
Low work stress	1, 0.008
High work stress	1.00 2.33, 1.25-4.37

\*Extrinsic effort: high score = high effort (i.e. high score is bad). \*\*Intrinsic effort: high score = high effort (i.e. high score is bad). \*\*\*Reward: high score = high reward (i.e. high score is good). \*\*\*\*Total support: high score = high support (i.e. high score is good).

### A1.3 Ethnicity and general poor health

**Table 12**  
**Poor general health by ethnic group**

Ethnic group	Good health	Poor health	Total
	N (%)	N (%)	N (%)
White	186 (86)	30 (14)	216 (100)
Bangladeshi	172 (84)	33 (16)	205 (100)
Black Caribbean	164 (80)	40 (20)	204 (100)
Total	522 (83)	103 (17)	625 (100)

**Table 13**  
**Association between poor health and ethnic group**

	p OR, CI
White	0.29 1.00
Bangladeshi	1.19, 0.70-2.03
Black Caribbean	1.51, 0.90-2.54

Analyses were carried out following the same strategy and are summarised in Table 14 below.

**Table 14**  
**Summary of ethnicity and general health analyses**

<b><u>Stage 1. Demographic, personality and other factors</u></b> Step c). Multivariable analyses		
<b>Factors included in the analyses</b> ➔		<b>Factors identified as independently associated with poor health &amp; therefore to be included at Stage 2</b>
<b>Demographic</b>	Age, Sex, Marital status, Income, Education	Negative affect, Education
<b>Personality</b>	Negative affect	
<b>Other</b>	Racial discrimination, Other discrimination, Smoking	
<b><u>Stage 2. Occupational factors</u></b> Step c). Multivariable analyses		
<b>Factors included in the analyses</b> ➔		<b>Factors identified as independently associated with poor health &amp; therefore to be included at Stage 3</b>
<b>Occupational</b>	Full-time, Contract, Position, Manual, Occupation, Unfair treatment, Ethnic mix	Negative affect, Education, Unfair treatment
<b>Identified at Stage 1, step c</b>	Negative affect, Education	
<b><u>Stage 3. Work characteristics</u></b> Step c). Multivariable analyses		
<b>Factors included in the analyses</b> ➔		<b>Factors identified as independently associated with poor health</b>
<b>Work characteristics &amp; Work stress &amp; Psychological distress</b>	<b>Siegrist</b> Extrinsic effort, Intrinsic effort, Reward, Effort reward imbalance <b>Karasek</b> Job demand, Control, Total support <b>Conditions</b> Night-work, Shift-work, Long/unsociable hours, Noise	Negative affect, Education, Unfair treatment, Psychological distress
	<b>Identified at Stage 2, step c</b>	

**Table 15**  
**Association with poor health including ethnicity: supporting Table 11**

	df, p OR, CI
	11, 0.36
White male no racial discrimination	1.00
White male racial discrimination	0.72, 0.11-4.90
White female no racial discrimination	0.73, 0.27-1.93
White female racial discrimination	0.87, 0.11-6.73
Bangladeshi male no racial discrimination	1.97, 0.79-4.91
Bangladeshi male racial discrimination	0.64, 0.06-7.26
Bangladeshi female no racial discrimination	0.19, 0.04-0.97
Bangladeshi female racial discrimination	0.01, 0.00-
Black Caribbean male no racial discrimination	3410745.0
Black Caribbean male racial discrimination	1.31, 0.48-3.57
Black Caribbean female no racial discrimination	2.26, 0.35-14.75
Black Caribbean female racial discrimination	1.30, 0.54-3.11
	1.37, 0.29-6.44
	3, 0.002
Lowest negative affect	1.00
2 <sup>nd</sup> quartile	2.20, 0.80-6.14
3 <sup>rd</sup> quartile	3.95, 1.44-10.82
Highest negative affect	6.19, 2.24-17.12
	1, 0.02
No unfair treatment	1.00
Unfair treatment	2.46, 1.17-5.19
	3, 0.03
No qualifications	1.00
O level	0.42, 0.18-0.95
A level	0.38, 0.14-0.99
Further	0.37, 0.18-0.73
	1, <0.0001
No psychological distress	1.00
Psychological distress	3.09, 1.70-5.61

**Table 16**  
**Association with poor health excluding ethnicity**

	df, p OR, CI
Seldom/never nightwork	1, 0.07 1.00
Often/sometimes nightwork	1.67, 0.97-2.89
Lowest negative affect	3, 0.007 1.00
2 <sup>nd</sup> quartile	2.41, 0.88-6.61
3 <sup>rd</sup> quartile	3.66, 1.37-9.77
Highest negative affect	5.27, 1.98-14.02
No unfair treatment	1, 0.009 1.00
Unfair treatment	2.48, 1.26-4.89
No qualifications	3, 0.02 1.00
O level	0.44, 0.20-0.95
A level	0.38, 0.15-0.92
Further	0.36, 0.19-0.71
No psychological distress	1, 0.001 1.00
Psychological distress	2.75, 1.55-4.86

## APPENDIX 2

### Re-analyses of the data collected for the Bristol and Cardiff Studies

**Table 1**  
**Work stress by ethnic group**

Ethnic group	Low work stress N (%)	High work stress N (%)	Total N (%)
White	6684 (81)	1585 (19)	8269 (100)
South Asian	61 (84)	12 (16)	73 (100)
Black Caribbean	54 (64)	30 (36)	84 (100)
Total	6799 (81)	1627 (19)	8426 (100)

**Table 2**  
**Psychological distress by ethnic group**

Ethnic group	No psychological distress N (%)	Psychological distress N (%)	Total N (%)
White	6220 (75)	2048 (25)	8268 (100)
South Asian	54 (76)	17 (24)	71 (100)
Black Caribbean	64 (77)	19 (23)	83 (100)
Total	6338 (75)	2084 (25)	8422 (100)



**Table 3**  
**Association between psychological distress and ethnic group**

	p OR, CI
	0.91
White	1.00
South Asian	0.96, 0.55-1.65
Black Caribbean	0.90, 0.54-1.51

**Table 4**  
**General health by ethnic group**

Ethnic group	Good health	Poor health	Total
	N (%)	N (%)	N (%)
White	8046 (96)	309 (4)	8355 (100)
South Asian	69 (95)	4 (5)	73 (100)
Black Caribbean	81 (94)	5 (6)	86 (100)
Total	8196 (96)	318 (4)	8514 (100)

**Table 5**  
**Association between poor health and ethnic group**

	p OR, CI
	0.44
White	1.00
South Asian	1.51, 0.55-4.16
Black Caribbean	1.61, 0.65-3.99

## APPENDIX 3

### First phase interview response rates

#### Notes

1. Participants were selected on the basis of being in paid work, aged 18-65 and with a self-reported ethnicity of Black Caribbean, Bangladeshi or White (UK born). Those who were no resident at the address during fieldwork or temporarily sick were excluded. Altogether 626 participants were interviewed between 23<sup>rd</sup> September 2002 and 24<sup>th</sup> January 2003.
2. Households in the ratio 1:15 were selected from 5 councils in Hackney and Tower Hamlets from a database drawn from the electoral register and the Post Office Address File. Altogether 3181 households were selected, 3176 of which were approached by interviewers. Up to four attempts were made at each identified household to recruit participants. If the interview was refused, or the resident did not fit the research criteria, interviewers tried up to six households on either side of the identified one until a participant was recruited. This occurred 2769 times.
3. The unemployment rates (International Labour Organisation calculation) for the sampling area was 14%, compared to the national figure of 5.2%. The economic activity level was 57.75% (LFS 2002).
4. The age profiles of Hackney and Tower Hamlets were fairly representative of national figures with the exception of the Bangladeshi population, which was younger.
5. The team of 25 interviewers comprised men and women from each of the ethnic groups being investigated. Interviewer ethnicity and gender were matched with the interviewee as much as possible.
6. Interviewer's reported that Christmas, Ramadan and a lengthy armed siege in Hackney were events that had some effect in recruiting participants.
7. The total population of the five wards was 47,722, of which 4708 (10%) were Black Caribbean, 8998 (19%) Bangladeshi and 26,456 (55%) White (Census 1991). The recording of 'White' in the census does not necessarily mean 'White UK born'.
8. It was not possible to calculate a response rate for each ethnic group because the ethnicity of the householders in the random starting sample was not known.

When an interview was refused, it was not possible to assess ethnicity for both accuracy and ethical reasons.

9. Two response rates have been calculated overall for the whole sample.

#### Fieldwork Response Rates

1. Total addresses randomly identified and written to invite participation 3181
2. Total addresses actually attempted from (1) to invite participation 3176
3. Total six residences on either side of (2) attempted 2769
4. Overall, total number of attempted addresses (2)+(3) 5945
5. Total number of interview's done 626

#### **A. Refusals**

6. Informant refused 316
7. Refusal by other household member 30
8. Language difficulty 2
9. Language referral 52
10. Busy temporarily 101

Sub-total 501

#### **B. Other non-contacts**

11. No reply 2307
12. Address not contacted 4

Sub-total 2311

#### **C. Not eligible for study**

13. Not in paid work and sick permanently 1536
14. Out of 18-65 age band 151
15. Ethnicity not eligible 615
16. Away temporarily 16
17. Sick temporarily 7
18. Away during fieldwork 9

Sub-total 2334

#### **D. Addressees not contacted**

19. Premises empty or demolished 96
20. Address not traced 77

Sub-total 173

### Response Rate Calculation

Two response rate calculations are given below: (1) where all actual refusals, based on a face to face meeting with the interviewers, are included in the denominator; and (2) where all non-contacts are included after adjusting for levels of economic activity.

$$\begin{aligned} \text{(1) Response Rate} &= (5) / (5) + \text{Total (A)} \\ &= 626 / 626 + 501 \\ &= 626 / 1127 \\ &= 55.55\% \end{aligned}$$

$$\begin{aligned} \text{(2) Response Rate} &= (5) / (5) + \text{Total (A) + Total (B) minus adjusted by} \\ &\text{economic activity} \\ &= 626 / 626 + 501 + (2311 - 976) \\ &= 626 / 2462 \\ &= 25.4\%. \end{aligned}$$

## APPENDIX 4

### Follow-up interview questions

#### A. Introductory questions about general work history.

1. Tell me a little about your current job?
2. How long have you been doing it?
3. Have you held other jobs?
4. Have you had periods of unemployment?

#### B. Questions about Work Stress.

1. Tell me, what does work stress mean to you?
2. What kinds of things cause stress at work for you?
3. How does this stress affect you in your work or life in general?  
[Interviewers to be vigilant to narratives of discrimination and ethnicity, if none available to reflect back give following probe]
4. Does your ethnicity ever play a part in your experience of being stressed at work?
5. *[If required, ask] Have you encountered any discrimination at work? [Examples like 'not getting a promotion because of your ethnicity' may be necessary but should be avoided to reduce bias]*
6. If so, tell me about how you have experienced discrimination?
7. How has this experience of discrimination affected your work or life in general?





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