

## The measurement of well-being and other aspects of mental health

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New instruments are described for the measurement of both job-related and non-job mental health. These cover two axes of affective well-being, based upon dimensions of pleasure and arousal, and also reported competence, aspiration and negative job carry-over. Baseline data are presented from a sample of 1686 job-holders, and earlier uses of the well-being scales are summarized. The instruments appear to be psychometrically acceptable, and are associated with demographic and occupational features in expected ways. For example, older employees report greater job-related well-being; occupational level is positively correlated with job depression–enthusiasm but negatively associated with job anxiety–contentment; depression–enthusiasm is more predictable from low-to-medium opportunity for skill use and task variety, whereas anxiety–contentment is more a function of workload or uncertainty.

Many studies have examined the impact of work and careers on job-related and non-job mental health. Nevertheless, there is still a shortage of instruments whose psychometric properties have been determined through data from large samples of employees of both genders and several occupational levels. In particular, there is a need for measures which can provide information about affective well-being, subjective competence and aspiration, through scores which can be compared with known means and standard deviations from appropriate demographic groups.

This paper aims to address those deficiencies, by describing new instruments and summarizing values obtained from a large sample of British job-holders. The approach to affective well-being is through two principal axes ('anxiety–contentment' and 'depression–enthusiasm') which have emerged as important in non-occupational research, and which will be examined through parallel measures in both job-related and non-job settings. No other instruments are currently available which cover the full range of those axes in both types of setting.

The approach taken is one which emphasizes practicality as well as psychometric acceptability. Many occupational researchers are deterred by the length and cumbersome language of some previous instruments, and are tempted to introduce their own modifications or create new scales for one-off application. Such developments prevent the accumulation of comparative data and encourage an over-extensive range of instruments which all purport to tap the same construct. It is hoped that the straightforward nature of the scales introduced in this paper will be of value in many occupational settings.

### Affective well-being

A large number of measures of job-related affective well-being has already been developed. These cover specific facets of satisfaction, alienation from work, job attachment, job tension, depression, burnout, involvement and job morale (e.g. Cook, Hepworth, Wall & Warr, 1981). Context-free measures are available to tap life satisfaction, happiness, positive affect, negative affect, anxiety, depression, general dysphoria, self-esteem and other types of feeling (e.g. Diener, 1984; Goldberg, 1972).

Research into these aspects of well-being has been valuable and productive, but there is merit also in drawing upon findings from investigations into the structure of emotions and moods. Research has demonstrated the existence of two orthogonal dimensions, which account for the majority of observed variance (e.g. Russell, 1979, 1980; Watson & Tellegen, 1985; Watson, Clark & Tellegen, 1988; Zevon & Tellegen, 1982). These are summarized in Fig. 1, using the labels of 'pleasure' and 'arousal', with illustrative affective states ordered around the perimeter.

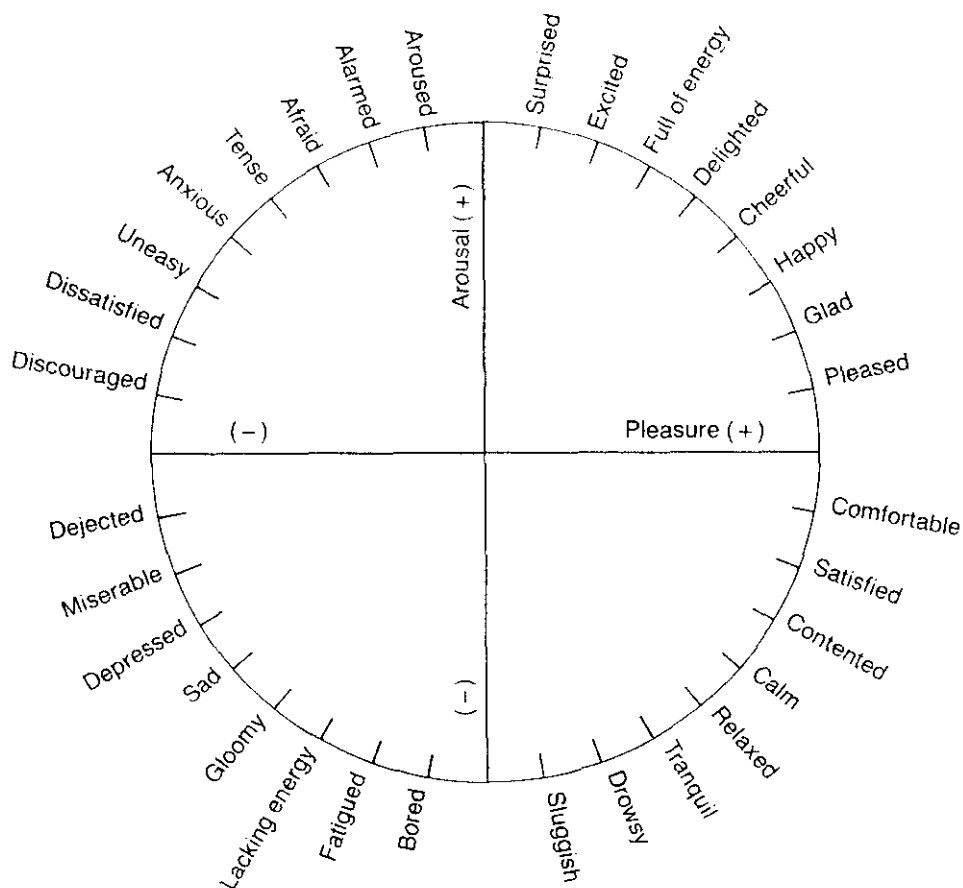


Figure 1. A two-dimensional view of affective well-being.

We may describe any form of affective well-being in terms of its location in relation to those separate dimensions and its distance from the mid-point of the figure. A particular level of pleasure may be accompanied by high or low levels of arousal, and a particular level of arousal may be either pleasurable or unpleasurable. In devising primary measures of well-being, decisions have thus to be taken about the location of key vectors in that two-dimensional space.

Warr (1987) has suggested that three main axes should be considered. Two of these take account of arousal as well as pleasure, by running diagonally between opposite quadrants through the mid-point of Fig. 1. In addition, in view of the central importance of low or high pleasure, it is helpful to take measures along that horizontal dimension alone, without regard to variations in arousal.

That possibility is illustrated in Fig. 2. Pleasure and arousal are retained as the horizontal and vertical dimensions, with two diagonal axes running between opposite quadrants. The latter, and that representing pleasure alone, are labelled as the three key indicators of affective well-being: (a) displeased–pleased, (2) anxious–contented, and (3) depressed–enthusiastic. Principal types of affect may be located anywhere along those axes. The arousal dimension on its own is not considered to reflect well-being, and its poles are therefore left unlabelled.

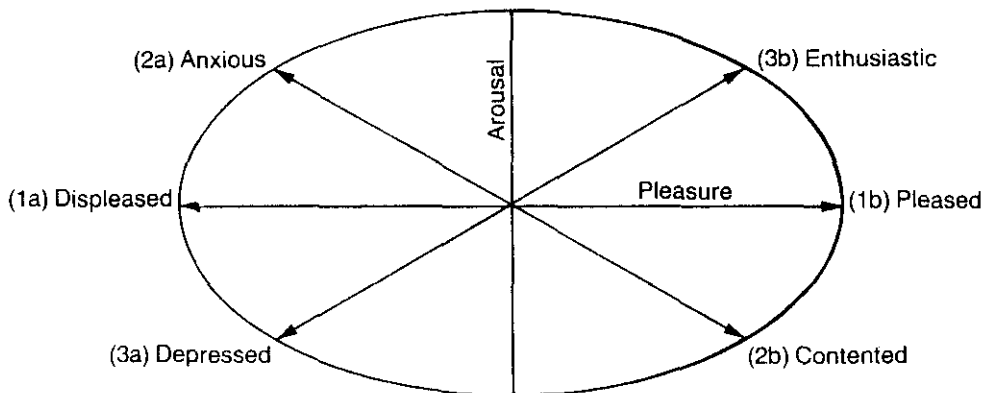


Figure 2. Three principal axes for the measurement of affective well-being.

The diagram is presented as an elongated (rather than circular) shape to indicate that pleasure is empirically accorded greater weight than arousal. Experienced pleasure may differ substantially across situations, and these differences are more likely to be reflected in well-being than variations in arousal. Scores on axes two and three are thus likely to be positively intercorrelated in practice, rather than being independent, as suggested by the ideal conceptualization of Fig. 1.

Within this framework, the precise location of the diagonal axes may be varied according to research needs. For example, studies of cognitive performance in complex tasks may be particularly concerned with possible changes in arousal, to examine the degree to which job conditions lead to feelings of lethargy and fatigue. The third axis may in those cases be defined towards the vertical dimension. Measurements then would be

more concerned with tiredness–vigour than with depression–enthusiasm. In some cases, both forms of the third axis may be studied; this possibility is considered later.

As outlined in the research literature cited above, it is not possible to reduce all emotional experiences to these principal dimensions. The structure shown in Fig. 1 is viewed as complementary to more differentiated accounts, particular types of which might be more appropriate in certain settings. For example, detailed examination of aspects of well-being associated with specific pharmaceutical agents may benefit from measures which cover a wider set of feelings. However, assessment of these three forms of well-being can provide basic information, permitting addition of other measures when that is desired.

The pleasure axis, shown horizontally in the figures, has often been measured through scales of reported job or life satisfaction. Many instruments are available for job-specific or context-free application (e.g. Cook *et al.*, 1981), and the present paper will focus on well-being axes two and three. These deserve particular attention in occupational research, to examine feelings of arousal as well as pleasure.

Relevant 10-item scales have been devised by Watson, Clark & Tellegen (1988), with respondents indicating the degree to which they are distressed, hostile, jittery, attentive, interested, alert, etc. Impressive data about reliability and concurrent validity are available, and links with the pleasure/arousal perspective have been emphasized. However, the scales are limited in that all items fall into the top half of Figs 1 and 2, rather than covering the full length of the axes. Furthermore, their focus is intentionally very broad, also asking, for example, whether respondents felt ashamed, guilty, proud and strong. These context-free instruments do not lend themselves easily to occupational research.

Axes two and three have also been tapped through the context-free checklist described by Mackay, Cox, Burrows & Lazzarini (1978); (see also Cox & Mackay, 1985; and Cruickshank, 1984). This contains 34 adjectives, 19 of which fall on axis two as shown in Fig. 2. The others range from tiredness to vigour, covering a more vertical form of axis three than the one shown in the figure. A 20-item derivative of this context-free measure has been examined by Fischer & Donatelli (1987), Fischer, Hansen & Zemore (1988), King, Burrows & Stanley (1983), and King, Stanley & Burrows (1987), in studies which provide encouraging evidence about internal reliability and psychometric adequacy.

These and other authors have demonstrated the robustness of the diagonal axes shown in Fig. 2. However, the emphasis has been on context-free mental health, and many items are unsuitable for occupational application. The present study examines the two diagonal axes through scales which use familiar adjectives, and cover equally the four quadrants of Fig. 2; axis three is represented by depression–enthusiasm rather than tiredness–vigour; and the focus is upon job-related as well as non-job well-being.

### Other aspects of mental health

In addition to affective well-being, high or low mental health is also exhibited through behaviour in transactions with the environment. Such behaviours are conceptually quite distinct from the feelings involved in well-being, although associations between behaviour and well-being are likely to be observed in practice. Two major behavioural components are competence and aspiration (Warr, 1987).

Competence (e.g. Smith, 1968) has been widely discussed in the psychological literature. For example, Jahoda (1958) wrote in terms of 'environmental mastery', Bradburn (1969) examined people's ability to cope with and transcend their 'difficulties in living', and Bandura (e.g. 1977) investigated beliefs about 'self-efficacy' or 'expectations of personal mastery'. A competent person is one who has adequate psychological resources to deal with experienced difficulties. As with other aspects of mental health, a distinction should be drawn between context-free competence and domain-specific competence, and separate measurement of the two forms can be made. In both cases, it is necessary to distinguish between subjective and independent assessments, with subjective competence being measured through self-reports, and independent assessments being made by a relevant observer. The present study examines two scales of subjective competence, covering separately job and non-job experiences.

A similar approach is taken to the measurement of aspiration. A mentally healthy person is often viewed as having an interest in, and engaging with, the environment. He or she establishes goals and makes active efforts to attain them, through motivated behaviour, alertness to new opportunities, and efforts to meet challenges that are personally significant. Conversely, low levels of aspiration are exhibited in reduced involvement and activity, and in an acceptance of present conditions even when they are unsatisfactory. This aspect of mental health has been emphasized in occupational research by Herzberg (1966), who examined the impact of job features on workers' 'psychological growth'. Maslow (e.g. 1973) developed a similar perspective in terms of 'self-actualization', and parallel themes have been explored by Csikszentmihalyi (1975) and Kornhauser (1965). Two measures of reported aspiration, job and non-job, will be investigated here.

There appear to be no instruments available to tap reported job-related competence and aspiration in a manner appropriate for both shop-floor and managerial employees. Baseline data about non-job as well as job-related components of those kinds would be useful for comparison with subsequent investigations.

There has also been interest in the carry-over of job experiences into other activities and feelings. For example, Evans & Bartolome (1980), Piotrkowski (1978) and others have documented negative influences on family and leisure life. Reports of such carry-over have been examined in the present study, for comparison with other findings, and in relation to scores on the measures summarized above.

### **Aims of this paper**

This paper will describe new measures of these aspects of mental health, and present baseline information from a large sample of male and female workers. Two axes of affective well-being, and reported competence and aspiration, will be studied through parallel sets of questionnaire items to assess both job-related and non-job mental health. The aims are to characterize these instruments, and to make available comparative data from men and women of different ages and occupational levels.

Scale validity will be examined in terms of demographic features, other aspects of mental health, and through correlations with reported job characteristics. For example, it is expected from research with other measures that older people will exhibit greater

job-related well-being than younger people, and that employees in high-level jobs will report more job enthusiasm and aspiration than those at lower levels. Positive correlations with intrinsic job characteristics are expected, but the measures described here permit us to go beyond most earlier research in investigating a differential pattern of associations, with varied relationships with job features expected according to which aspect of mental health is under investigation; this point will be developed later.

Evidence about axes two and three of job-related well-being will also be provided through results from two separate samples, shop-floor workers in a manufacturing company and professional staff attending a clinic for assistance in the management of personal job stress.

## Method

### *Respondents and data-gathering*

Data were obtained from 1686 employed men and women, all of whom were in jobs for more than 30 hours a week. A sample was drawn with approximately equal numbers of men and women (839 and 847), in which gender was balanced within occupational level and age.

Three occupational levels were specified, in terms defined by the Registrar-General as grades A and B, C1 and C2, and D. Grades A and B include professional and managerial workers in relatively senior positions; grades C1 and C2 cover lower professional and supervisory jobs and skilled non-supervisory positions; and grade D jobs are those manual positions requiring little or no skill. Within these three levels, the numbers of male and female respondents respectively were: AB, 269 and 247; C1C2, 307 and 342; D, 263 and 258.

Three age levels were specified in drawing up the sample: 18 to 34 years, 35 to 49, and 50 years or above. Within each age group, the numbers of men and women were: 18 to 34, 279 and 299; 35 to 49, 287 and 289; 50 and above, 273 and 259.

Respondents were interviewed at home by survey research company staff in 75 locations throughout the United Kingdom. Initial and final groups of questions were asked orally, covering a range of job and personality issues, and respondents themselves completed two questionnaires during the middle part of the meeting. The first of these was headed 'Questions about your job', and instructions asked for responses in terms of 'how things have been going in the past few weeks'. The second questionnaire was labelled 'Questions about your life outside your job', and asked respondents to 'turn your attention away from your job and think about other parts of your life, your family and spare-time activities'. As before, the focus was on 'the past few weeks'.

Both questionnaires contained items in the sequence of well-being axes two and three followed by reported competence and aspiration. Within the job-related questionnaire, subsequent items, not reported in detail here, concerned perceptions of job features such as workload and opportunity for personal control.

### *The measures*

Axes two and three of affective well-being were examined in the terms described earlier, through six-item scales derived from pre-tests carried out in a range of settings. The job-related items were preceded by the question, 'Thinking of the past few weeks, how much of the time has your job made you feel each of the following?' Responses were: never, occasionally, some of the time, much of the time, most of the time, all of the time; and answers were scored from 1 to 6 respectively. Items covering the two axes were intermingled in the questionnaire.

Axis two, job-related anxiety-contentment, was assessed through the adjectives tense, uneasy, worried, calm, contented and relaxed. Responses to the first three items were reverse-scored, so that high scores indicated positive well-being, and coefficient alpha was found to be .76.

Axis three, job-related depression-enthusiasm, was tapped by depressed, gloomy, miserable, cheerful, enthusiastic, optimistic. The first three items were again reverse-scored, and coefficient alpha was .80.

For non-job well-being these two axes were measured in the same way, but with the question, 'In the past few weeks, how much of the time in your life outside your job have you felt each of the following?' Alpha coefficients were .81 for each of the axes.

Reported job competence and job aspiration were each measured through responses scored 1 to 5 along the continuum: strongly disagree, disagree, neither disagree nor agree, agree, strongly agree. Six statements were used in each case, interspersed in the first questionnaire, and coefficients alpha were .68 and .62 respectively. These scales, and those for non-job competence and non-job aspiration (intermixed in the second questionnaire), are presented in Appendix 1. Coefficients alpha for the non-job measures were .71 and .64 respectively. Both sets of measures were based upon concepts and more wide-ranging questionnaires developed by Pearlin, Menaghan, Lieberman & Mullan (1981), Rotter (1966) and Wagner & Morse (1975). Note that they cover reported competence or aspiration which is relative to a person's own circumstances. For example, the job competence items tap ability to cope with a current job rather than absolute levels of occupational ability.

Within the first questionnaire were four items to cover negative job carry-over. Responses were again in terms of the five-point agree-disagree scale, and coefficient alpha was found to be .78. These items are also in Appendix 1.

## Results

### *Affective well-being: Principal components analyses*

The 12 adjectives to tap well-being were chosen on the basis of the earlier studies described above, which have pointed to the existence of two bipolar axes running diagonally through the midpoint of Figs 1 and 2. Can these axes be identified empirically, through principal components analyses of the present data? Previous analyses in other settings (for example, of the Multiple Affect Adjective Check List and the Profile of Mood States) have pointed to the need to control for generalized response set. It is typically found that, without such control, the two major components in this kind of data are separate groups of positive and negative items, to the right and left of the vertical axis in Figs 1 and 2.

Such a separation appears likely to reflect the operation of acquiescent response set. Gotlib & Meyer (1986) and others have pointed out that this feature may be of differential impact, for example, between respondents, or with variations in acquiescence greater for negative than for positive adjectives. These effects would reduce correlations between negative and positive scale items and increase correlations within negative and positive groups, giving rise to factors made up entirely of either negative or positive items.

Several investigators have therefore controlled for acquiescent response set in examining the factor structure of adjectives in context-free self-report scales. For example, Lorr, Shi & Youniss (1989) found in a 60-item list the two bipolar components which are expected here. Response set was estimated as the total score across all items, without any reverse-scoring, and this was controlled in partial correlations between each item; factor analysis was carried out on the matrix of these partial correlations. Applying this procedure to the 12 adjectives in the present well-being measure revealed the structure shown in Table 1. For both job-related and non-job affect two factors were present (eigenvalues greater than 1.00), and it can be seen that these correspond to axes two and three of well-being as defined above.

There is another way to examine the structure of the well-being items without possible interference from differential acquiescence response set for positive and negative items. This involves separate analyses for the six positive and the six negative items making up

**Table 1.** Varimax-rotated factor loadings greater than .40, from partial correlations between affective well-being items, controlling for response set ( $N = 1686$ )

	Job-related affect		Non-job affect
Tense	.70		.71
Uneasy	.43	.52	.58
Worried	.66		.66
Calm	.78		.76
Contented	.41	.62	.65
Relaxed	.79		.81
Depressed		.68	.47 .67
Gloomy		.75	.44 .61
Miscrable		.71	.47 .63
Cheerful		.56	.47
Enthusiastic		.79	.72
Optimistic		.65	.79

*Note.* Scoring of the six negative items has been reversed.

the two scales. Four principal component analyses of those kinds have been carried out separately for positive and negative items in the job-related and the non-job scales. Each varimax-rotated two-factor solution contained distinct three-item components representing quadrants above and below the horizontal axis of Figs 1 and 2, supporting the structure assumed in the pleasure/arousal model.

#### *Intercorrelations between measures*

The correlations observed between these measures of affective well-being and other aspects of mental health are shown in Table 2. Recall that higher scores indicate greater contentment or enthusiasm (and thus lower anxiety or depression), as well as greater competence, aspiration and negative carry-over.

Consistent with the location of axes in Fig. 2 (at less than 90 degrees to each other), the two well-being scores in each domain (job and non-job) are strongly intercorrelated (.66 and .73). Correlations of job-related depression–enthusiasm are significantly greater with job aspiration than with job competence (.46 and .26,  $p < .001$ ). This appears to reflect the impact of the arousal dimension, with reports of enthusiasm and aspiration both deriving from high arousal as well as high pleasure (the top right-hand quadrant in the well-being figures).

Conversely, negative carry-over from the job is significantly more strongly correlated with job anxiety–contentment than with depression–enthusiasm (–.54 and –.30), and inverse carry-over correlations are significantly greater with reported competence than reported aspiration (both job and non-job). Anxiety–contentment is also significantly more predictable from reported competence than from aspiration. (The  $p < .001$  criterion has been used in all cases.)



Table 2. Intercorrelations between aspects of mental health ( $N = 1686$ )

	2	3	4	5	6	7	8	9
<i>Affective well-being</i>								
1. Job anxiety-contentment	.66	.34	.48	.36	.24	-.54	.28	.13
2. Job depression-enthusiasm		.27	.58	.26	.46	-.30	.27	.21
3. Non-job anxiety-contentment			.73	.30	.17	-.46	.48	.25
4. Non-job depression-enthusiasm				.28	.30	-.32	.49	.40
<i>Other aspects of mental health</i>								
5. Reported job competence					.36	-.37	.44	.21
6. Reported job aspiration						-.10	.29	.38
7. Negative carry-over							-.30	-.13
8. Reported non-job competence								.49
9. Reported non-job aspiration								

Note. As described in the text, high scores on variables 1 and 3 reflect contentment, and high scores on variables 2 and 4 reflect enthusiasm. Values greater than .07 are significant at the  $p < .001$  level.

#### *Mean scores and demographic variations*

Mean scores are set out in Table 3, with the overall pattern summarized in the first column. Because of the large number of cases, these values may be used in comparison with subsequently gathered data, but it should be noted that the sample was not intended to be entirely representative of the population. In order to permit reliable analyses of sub-group data, the design sought disproportionately more people in occupational levels either higher or lower than the average. In the present sample, 31, 38 and 31 per cent of respondents are in occupational levels AB, C1C2 and D respectively; comparable figures for the employed population as a whole are around 17, 58 and 25 per cent.

Comparisons between male and female responses (in columns two and three) reflect job and other environmental variations as well as possible gender effects on their own. In the present case, women exhibit significantly greater job enthusiasm than men, and report significantly greater difficulty in coping with their paid work (in terms of the job competence scale).

Occupational-level scores present a coherent pattern of differences, with the direction of trends varying between specific aspects of mental health. As would be expected, people in high-level jobs report significantly more job-related enthusiasm; but their scores are also significantly lower on job anxiety-contentment (that is, they report more anxiety). Higher-level employment is thus associated with greater arousal levels of both kinds identified by axes two and three.

Reported job aspiration and negative carry-over are also greater at higher job levels, but the reverse pattern is found for reported job competence. This latter finding reflects the fact that the subjective job competence scale taps reported ability to cope with one's own

Table 3. Mean mental health scores (standard deviations in parentheses)

	Full sample	Gender		Occupational level				Age		
		Men	Women	AB	C1C2	D	18 to 34	35 to 49	50 and above	
<i>Affective well-being</i>										
1. Job anxiety-contentment	4.17(.81)	4.12 (.82)	4.22 (.80)	3.96*(.77)	4.20*(.82)	4.35*(.80)	4.06*(.80)	4.12*(.82)	4.34*(.82)	
2. Job depression-enthusiasm	4.55(.79)	4.48*(.81)	4.62*(.76)	4.61*(.70)	4.58*(.82)	4.46*(.83)	4.48*(.78)	4.51*(.81)	4.68*(.76)	
3. Non-job anxiety-contentment	4.41(.76)	4.43 (.75)	4.39 (.78)	4.31*(.74)	4.43*(.77)	4.48*(.77)	4.36*(.75)	4.36*(.79)	4.52*(.73)	
4. Non-job depression-enthusiasm	4.62(.72)	4.63 (.70)	4.62 (.73)	4.66 (.69)	4.65 (.70)	4.56 (.75)	4.60 (.67)	4.57 (.76)	4.71 (.71)	
<i>Other aspects of mental health</i>										
5. Reported job competence	3.88(.54)	3.94*(.54)	3.82*(.53)	3.78*(.56)	3.93*(.53)	3.93*(.50)	3.77*(.53)	3.91*(.53)	3.98*(.54)	
6. Reported job aspiration	4.06(.50)	4.03 (.53)	4.09 (.48)	4.22*(.42)	4.07*(.50)	3.90*(.53)	4.04 (.50)	4.07 (.52)	4.09 (.49)	
7. Negative carry-over	2.73(.91)	2.68 (.91)	2.77 (.92)	3.03*(.95)	2.65*(.90)	2.53*(.82)	2.75 (.88)	2.77 (.91)	2.65 (.95)	
8. Reported non-job competence	3.76(.53)	3.79 (.50)	3.74 (.56)	3.78 (.54)	3.79 (.53)	3.72 (.53)	3.75 (.52)	3.76 (.55)	3.79 (.53)	
9. Reported non-job aspiration	3.92(.48)	3.90 (.48)	3.95 (.50)	3.99*(.47)	3.93*(.48)	3.84*(.50)	3.97 (.46)	3.91 (.51)	3.88 (.49)	
Number of cases	1686	839	847	516	649	521	578	576	532	

Note: Significant differences between means in each group have been confirmed in more controlled analyses through multiple regressions of each mental health variable on gender, occupational level and age together.

\*  $p < .001$ , in comparisons between groups.

job; it is not an absolute index of competence of the kind that would be expected to correlate positively with job level.

Significant age differences are found in respect of job-related anxiety-contentment, depression-enthusiasm and reported job competence, with older people exhibiting higher scores. This pattern is widely found (e.g. Rhodes, 1983), and is likely in part to reflect variations in job content. Observed greater non-job contentment in older respondents is also likely to derive from environmental differences associated with increasing age within this range; note, however, that reported non-job competence and aspiration remain constant across the age groups.

Two-way analyses of variance were carried out on all combinations of gender, occupational level and age; no interactions were statistically significant. Additional examination was made in order to identify the pattern of associations with the number of weekly hours worked (mean = 44.67; SD = 10.83). Correlations with all the mental health variables were insignificant ( $p > .001$ ), except for negative carry-over ( $r = .19$ ). Controlling for gender, occupational level, age, marital status and educational qualifications left that correlation unchanged (partial  $r = .19$ ).

#### *Associations with job content*

It is of interest to examine the associations of mental health scores with variations in perceived job characteristics. Table 4 summarizes correlations with reports on three-item

**Table 4.** Correlations between perceived job characteristics and nine indices of mental health ( $N = 1686$ )

	Low-to-medium levels		
	Skill use	Personal control	Work-load
<i>Affective well-being</i>			
1. Job anxiety-contentment	.01	.25	-.10
2. Job depression-enthusiasm	.26	.37	.17
3. Non-job anxiety-contentment	.04	.17	-.01
4. Non-job depression-enthusiasm	.14	.22	.11
<i>Other aspects of mental health</i>			
5. Reported job competence	.02	.13	.00
6. Reported job aspiration	.45	.40	.39
7. Negative carry-over	.10	-.14	.23
8. Reported non-job competence	.09	.17	.13
9. Reported non-job aspiration	.13	.20	.18

*Note.* Values greater than .07 are significant at the  $p < .001$  level.

scales of perceived skill use, personal control and workload. These scales were designed to cover low-to-medium values of each characteristic, with items worded consistently in terms of very little skill use, control or workload (for further details, see Warr, 1990).

Low levels of intrinsic job characteristics, such as skill use and personal control, might be expected to be primarily associated with reduced arousal, reflected in low depression–enthusiasm and low job aspiration, rather than in terms of anxiety–contentment and ability to cope as tapped by the job competence scale. That pattern is found in the table. For skill use, correlations are significantly greater with job and non-job depression–enthusiasm (.26 and .14) than with anxiety–contentment (.01 and .04) ( $p < .001$ ), and differences between correlations with job aspiration and job competence mirror that contrast (.45 and .02 respectively;  $p < .001$ ). These differences are also significant for personal control ( $p < .001$  for the two axes of job well-being and for job competence and aspiration). In general, variations in those two job characteristics are accompanied by variations in low-arousal pleasure, in the terms of Fig. 2.

Conversely, perceived workload is significantly more negatively associated with anxiety–contentment than with depression–enthusiasm (–.10 vs. .17, and –.01 vs. .11 for job and non-job affect respectively;  $p < .001$ ), as expected from the fact that raised workload is likely to be associated with both greater arousal and negative feelings: the top-left quadrant of the figures. The scales for well-being dimensions two and three are in these ways differentially associated with job characteristics in a manner which parallels the common belief, in clinical psychology, that depressed feelings are more associated with loss or deprivation whereas anxious feelings are more likely to reflect a response to threat or danger.

The correlations in Table 4 remain almost unchanged after controls are introduced for occupational level, educational qualifications, age, gender and marital status. However, the exact values are of less concern here than the finding that associations with job features vary between the separate instruments under examination.

### *Additional data*

Earlier versions of the scales to tap axes two and three of job-related affective well-being have been used in research with several other groups. Two examples will be cited here: from 246 shop-floor assembly workers in a micro-electronics factory (both male and female), and 96 professional and managerial workers (male and female) who were taking part in psychotherapy to reduce their high levels of job strain. Data were gathered by Wall, Clegg, Davies, Kemp & Mueller (1987) and Shapiro, Barkham, Hardy & Morrison (1990) respectively.

Well-being axes two and three were each examined through six adjectives. Seven of the 12 were the same as in the study described above; and anxious, frustrated, comfortable, keen and lively were used in place of the later selection of worried, uneasy, contented, cheerful and optimistic respectively. Controlling for acquiescent response set again revealed the expected two-factor structure in both sets of data.

The two forms of job-related affective well-being were significantly intercorrelated (.54 and .58 in the two studies), but their validity is again supported through a differentiated pattern of associations with other variables. For example, Table 5 shows that job depression–enthusiasm is significantly more closely related to intrinsic job satisfaction

**Table 5.** Affective well-being dimensions two and three among shop-floor workers in a micro-electronics assembly department: Correlations with other variables ( $N = 248$ )

	Job anxiety- contentment	Job depression- enthusiasm
Intrinsic job satisfaction	.21*	.40*
Extrinsic job satisfaction	.31	.33
Reported job motivation	.20*	.40*
Reported skill use	.15*	.46*
Reported job complexity	.18*	.47*
Reported attentional control	.12*	.31*
Reported task repetition	.05*	-.22*
Reported work overload	-.40*	-.09*
Context-free distress (GHQ)	-.46	-.39

\* $p < .001$  between a pair of correlations.

than is anxiety-contentment ( $r = .40$  and  $.21$  respectively, measuring satisfaction through the scale described by Warr, Cook & Wall, 1979). This significant difference is also present in relation to reported job motivation, measured through items similar to those in the scale of job aspiration described above.

In terms of job characteristics, the pattern is similar to that in Table 4. Strong associations are found between depression-enthusiasm and aspects of intrinsic job features: reported skill use, job complexity, attentional control and the absence of repetition; correlations of these variables with the anxiety-contentment axis are significantly lower. Conversely, work overload is associated with greater job anxiety ( $r = -.40$ ), but there is no such association with job enthusiasm-contentment ( $r = -.09$ ).

Finally, it can be seen in Table 5 that both aspects of job-related well-being are significantly correlated with scores on the 12-item General Health Questionnaire (Goldberg, 1972). That questionnaire is an indicator of context-free well-being along the left-hand side of the horizontal axis of Fig. 2. The new scales described here provide additional data to those derived from the GHQ, in that they cover separate diagonal axes and permit measurement of both job-related and non-job affect.

A third set of data is illustrated in Table 6, which presents intercorrelations between variables measured before the commencement of therapy. The job characteristic measures were different from those described above, but the scale of job satisfaction was the same as in the manufacturing study. The findings provide similar support for the new well-being scales.

As expected from the previous results, job depression-enthusiasm is significantly more closely associated with intrinsic job satisfaction and reported skill use than is anxiety-contentment. On the other hand, anxiety-contentment is more predictable from job clarity (about standards and future prospects) and (negatively) from reported overload than is the other dimension. Table 6 also reports associations with two context-free measures of

**Table 6.** Affective well-being dimensions two and three among professional and managerial workers attending a job stress clinic: Correlations with other variables before commencement of therapy ( $N = 96$ )

	Job anxiety- contentment	Job depression- enthusiasm
Intrinsic job satisfaction	.34*	.52*
Extrinsic job satisfaction	.40	.45
Negative carry-over	-.46*	-.30*
Reported skill use	.30*	.51*
Reported control opportunity	.29	.34
Reported task variety	.02	.19
Reported social support	.31*	.48*
Reported job clarity	.32	.19
Reported work overload	-.39**	-.10**
Context-free depression	-.09	-.24
Self-esteem	.33	.30

\* $p < .05$ ; \*\* $p = .01$  between a pair of correlations.

mental health, the Beck Depression Inventory (BDI) (Beck, Ward, Mendelson, Mock & Erbaugh, 1961) and an eight-item self-esteem measure based on that devised by Rosenberg (1965). As would be predicted, job-related depression-enthusiasm is more related than anxiety-contentment to the (context-free) BDI ( $-.24$  vs.  $-.09$ ), but no differences are found for the more general self-esteem measure. However, for this size of sample the difference between correlations with the BDI is not significant.

This study also permitted measurements of changes as a result of psychotherapy. Significant improvements were recorded in several standard clinical indicators, assessing context-free mental health. Since the focus of the therapy was on job-related as well as more general problems, scores on both axes two and three of job-related well-being would also be expected to improve significantly. This was in fact observed ( $p < .001$  in both cases).

### Discussion

These questionnaire measures of affective well-being and other aspects of mental health appear to be psychometrically acceptable, easy for job-holders at all levels to complete, and associated with demographic and occupational features in predicted ways. The approach to well-being is based upon an externally supported two-dimensional framework, and, although the well-being instruments yield scores which are (as expected) intercorrelated, they exhibit different associations with other factors which provide evidence of their validity.

For example, higher occupational level was found to be positively associated with job depression-enthusiasm but negatively associated with anxiety-contentment, reflecting

raised arousal of both kinds in higher-level jobs. Age differences paralleled those found in earlier research, but provided additional information through the comparison of job-related competence and aspiration; the former was significantly positively correlated with age, but the latter was not. The length of a person's working week was unrelated to all aspects of mental health examined here, except for negative carry-over ( $r = .19$ ).

Intrinsic job satisfaction tended to covary more with depression–enthusiasm than with anxiety–contentment, but no difference was observed for extrinsic satisfaction; this pattern is consistent with the meanings of the constructs. So is the observed overlap between negative carry-over, job anxiety–contentment and reported competence. Across the studies, with different measures of job features, depression–enthusiasm was more predictable from variables such as low-to-medium opportunity for skill use and task variety, whereas anxiety–contentment was more a function of high workload or uncertainty. The former characteristics can be viewed as illustrating aspects of deprivation, whereas the latter reflect possible threats; the pattern is consistent with non-occupational thinking about depression and anxiety.

Context-free constructs of those kinds have been investigated in clinical and community research. Measures of anxiety and depression are consistently found to be highly intercorrelated (Dobson, 1985, reports an average correlation of .61), but there is usually agreed to be merit in retaining both concepts when examining context-free mental health and ill-health. By the same token, the present domain-specific measures of axes two and three of affective well-being are empirically associated (between .54 and .73 with the samples used above), but they are differentially correlated with other factors. It is important to consider them both.

The third axis of well-being was identified in Fig. 2 as running from depression to enthusiasm, and items to tap those aspects of the opposed quadrants of the figures have been described here. However, it was suggested in the introduction to this paper that in some investigations there might be particular interest in a more vertical axis within those quadrants, closer to the arousal dimension and ranging from tiredness to vigour. Such an axis has also been examined in the present study, but for clarity of presentation full results have not been included in this paper. Summary details are provided in Appendix 2.

The new scales of reported competence and aspiration in job and non-job settings were found to yield coherent results along plausible lines. Significant associations with occupational level, age, job characteristics and affective well-being have been described above. However, those measures are so far primarily supported by other forms of self-report data. This also applies to the instruments for measuring axes two and three of affective well-being, and there is now a general need to test the validity and usefulness of all these scales against behavioural and other objective criteria.

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## Appendix 1

The items used to measure reported competence, aspiration and negative job carry-over are given below. Those marked '(R)' were reverse-scored.

### *Reported job competence*

- I can do my job well
- I sometimes think I am not very competent at my job (R)
- I can deal with just about any problem in my job
- I find my job quite difficult (R)
- I feel I am better than most people at tackling job difficulties
- In my job I often have trouble coping (R)

### *Reported job aspiration*

- In my job I like to set myself challenging targets
- I am not very interested in my job (R)
- I enjoy doing new things in my job
- I prefer to avoid difficult activities in my job (R)
- In my job, I make a special effort to keep trying when things seem difficult
- I am not very concerned how things turn out in my job (R)

### *Negative job carry-over*

- After I leave my work, I keep worrying about job problems
- I find it difficult to unwind at the end of a work-day
- I feel used up at the end of the work-day
- My job makes me feel quite exhausted by the end of a work-day

### *Reported non-job competence*

- I can deal with just about any problem in my non-job life
- I sometimes think I am not very competent in my non-job life (R)
- Most things I do, I do well
- I find my non-job life quite difficult (R)
- I feel I am better than most people at tackling difficulties
- I often have trouble coping in my non-job life (R)

### *Reported non-job aspiration*

- I enjoy doing new things in my non-job life
- I am not very interested in the world around me (R)
- I like to set myself challenging targets in my non-job life
- I prefer to avoid difficult activities in my non-job life (R)
- I make a special effort to keep trying when things seem difficult
- I am not very concerned how things turn out in my non-job life (R)

## Appendix 2

As indicated in the Discussion section, this study also obtained information about an alternative indicator of the third axis of affective well-being, ranging from tiredness to vigour. The items used to measure this set of feelings in both the job and non-job questionnaires were: fatigued, lifeless, tired, alert, full of energy and lively; and as with the other scales the first three were reverse-scored. These items were additionally presented with the 12 items of the two primary scales, described above.

Principal component analyses of these axis three items with the previously described axis two items revealed the separate factors specified by the model. Using the partial correlation procedure described earlier, the expected two-component structure was apparent in both job and non-job responses after varimax rotation.

In order to assist comparison with future studies using the tiredness-vigour scale, the following mean values and standard deviations (in parentheses) are cited. Job-related responses: full sample, 4.20 (.76); men, 4.18 (.75), women 4.22 (.77); level AB, 4.16 (.69), level C1C2, 4.23 (.75), level D, 4.22 (.82); age 18 to 34, 4.14 (.75), age 15 to 49, 4.17 (.77), age 50 and above, 4.31 (.74) ( $p < .001$ ). For non-job responses, corresponding values were: 4.22 (.74), 4.22 (.72) and 4.22 (.75); 4.12 (.71), 4.24 (.72) and 4.29 (.77) ( $p < .001$ ); 4.24 (.72), 4.16 (.75) and 4.26 (.74). Samples sizes are shown in Table 3.

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