Researching and developing mental health and well-being assessment tools for supporting employers and employees in Wales.

Gary M. Williams

A thesis submitted for the award of PhD, 2014

Summary

The assessment and management of mental health and psychological well-being is an important issue in applied settings such as the workplace. In these settings however, the issues of practicality in terms of the resources available to devote to assessment and management are limited. This thesis presents research which aims to establish whether a single-item, multi-dimensional approach can be used to provide a practical way of measuring well-being in a short space while assessing and predicting well-being to a comparable level to traditional multi-item scales. Single-item measures were developed to assess well-being in terms of circumstances, individual differences, personality, and outcomes. These items were compared to multi-item measures in terms of their ability to measure the constructs in question and to predict well-being outcomes from predictor variables in samples of university staff, nurses, and students. The results indicate that many of the items are comparable to their multi-item counterparts and that single-item predictor measures can predict significant variance in well-being outcomes in both working adults and students. The result is a set of items that can be combined to create a well-being assessment tool that identifies well-being issues and potential causes. An example tool was prototyped in a small Welsh mental health support business.

Acknowledgements

My sincere gratitude to Professor Andy Smith for giving me the opportunity to complete this project and his invaluable guidance and support as supervisor over the years.

My thanks also to Dr Bill Fear for his support as secondary supervisor and the insight and advice he provided. Thanks also to Rusty Livock and Patrick Nash, as well as the rest of the Connect Assist staff, for accommodating me and providing a business perspective and to the European Social Fund and KESS scholarship for their funding.

Thanks to the rest of the research team in the Centre for Occupational and Health Psychology, particularly Paul Allen and Andrew Allen for their perspectives. Similarly, to the School of Psychology staff for their support in my development as a researcher and tothe support staff for keeping things running smoothly. Thanks to Bethan Carter, Katherine Davies, Marie Oak and Helen Oliver for their collection of the project students' data.

Finally, thank you to my family and friends for their support, particularly to Beth John who got me through all the rough patches.

DECLARATION

This work has not been submitted in substance for any other degree or award at this or any other university or place of learning, nor is being submitted concurrently in candidature for any degree or other award.

Signed …………………………………………… (candidate)   Date …………………………

STATEMENT 1

This thesis is being submitted in partial fulfillment of the requirements for the degree of …………………………(insert MCh, MD, MPhil, PhD etc, as appropriate)

Signed …………………………………………… (candidate)   Date …………………………

STATEMENT 2

This thesis is the result of my own independent work/investigation, except where otherwise stated.

Other sources are acknowledged by explicit references. The views expressed are my own.

Signed …………………………………………… (candidate)   Date …………………………

STATEMENT 3

I hereby give consent for my thesis, if accepted, to be available for photocopying and for inter-library loan, and for the title and summary to be made available to outside organisations.

Signed …………………………………………… (candidate)   Date …………………………

STATEMENT 4: PREVIOUSLY APPROVED BAR ON ACCESS

I hereby give consent for my thesis, if accepted, to be available for photocopying and for inter-library loans **after expiry of a bar on accesspreviously approved by the Academic Standards & Quality Committee.**

Signed …………………………………………… (candidate)   Date …………………………

Contents

List of tables

List of figures

Chapter 1 Introduction

1.1 Outline of the KESS studentship and its relevance to the thesis

This PhD thesis is funded by the European Social Fund through a Knowledge Economy Skills Scholarship (KESS). The KESS is intended to enable research that is performed in collaboration with businesses in the convergence area of Wales.

The implications of this for the research are that it is defined jointly between the school and the business and has a strong focus on business relevance. Further aspects of the funding criteria are that the project student must also devote time to development beyond the PhD (such as a 3 day graduate school course) and spend a significant proportion of their time working within the collaborating business. The research therefore is designed and performed with practical benefit in mind as well as academic contribution. This particular project was developed and completed in collaboration with Connect Assist.

Connect Assist processes and potential benefits of the project

Connect Assist is a social enterprise operating within the convergence of Wales. The business provides support to those suffering well-being issues such as issues related to stress or low mood. The business operates through online or telephone based contact with front-line staff, or in the case of online support, information and online tools are also provided for self-help. If a service user is considered to need more in-depth support, then they are also able to refer to an in-house counsellor who will provide weekly counselling sessions over the phone.

Although not a charity, the business operates by providing services for charities who wish to provide a point of contact and support for their members. Examples of the charities Connect Assist are involved with are the Teacher Support Network and as such work-related well-being issues represent a significant part of their work.

Connect Assist operates with the intention of providing the service user with a 'journey' to recovery. This journey may take the service user from online support and information at the first level, to front-line contact, and potentially to counselling where need be. This journey is fuelled by information gained from the service user throughout their contact with the services provided. When service users provide details on the website this is stored in a database which can be used for targeted emails or brought up by front-line staff or counsellors to provide a tailored approach to the support.

One drawback of the nature of the business is that very little time is available for each individual user during calls and in the case of online services a positive user experience is required. This means that while the business would benefit from being able to identify specific well-being issues or causes for these, this is not viable without a brief, practical method of doing so.

Benefit of the project

The potential benefits of the collaborative project for Connect Assist are therefore the ability to identify well-being issues and potential targets for intervention, benefiting the service user at each stage of support that Connect Assist provide. Brief online tools could allow the service user to assess their well-being and the data capture that Connect Assist employ would provide this information to front-line support and counsellors to aid them in identifying and discussing the service user's issues within the time restrictions inherent to the nature of the business.

Calls to front-line staff could be quickly focused to the underlying issues the service user may have, such as distinguishing between depression or dissatisfaction with work, reducing time spent trying to identify what the specific problem may be.

Counsellors would also be provided with this information or be able to use the tools themselves to identify targets for intervention and what is likely to be the most effective approach on an individual basis.

Connect Assist could also use the data gathered from such a tool to tailor their business in future based on the frequency of specific issues or needs, providing training or increasing services in a way which is targeted towards their users' needs.

The nature of this KESS project therefore meant that the research undertaken within had to meet the standards of academic rigour in order to meet the criteria for PhD award but also had to benefit the Welsh economy by providing results directly relevant to Connect Assist and their interests in the topic of practical well-being. As a result, the research presented was developed not only through standard academic processes such as identifying gaps in the literature but also as a result of specific business needs and interests established through time spent with Connect Assist.

The resulting research is therefore intended to balance academic requirements alongside business requirements and therefore the thesis includes references to, and discussion of, practical implications and applications. This occurs throughout the thesis but most comprehensively in Chapter 6 which is dedicated to discussing a period of work within Connect Assist where the results of the research at that stage in the project were applied to their business practices.

1.2 Objectives of thesis

The objectives of the thesis were therefore designed with both research and practical application in mind:

1) To identify the issues related to well-being and practicality that are relevant to Connect Assist and practical well-being measurement in general

The first step of the project was to identify what characteristics of well-being may have negative implications for its measurement in practical settings such as Connect Assist and how research may help to reduce these issues. The key conclusion of this Chapter was the necessity of a multi-dimensional approach and the use of single-item measures as an alternative to longer multi-item measures.

2) To examine whether single-item measures can accurately represent the relevant well-being constructs.

In order for single-item measures to be an appropriate approach to measurement, it was necessary to determine in the first instance whether they could accurately represent well-being constructs. This was completed by directly comparing single-item measures to more traditional multi-item measures of the same constructs to provide a direct comparison between proposed method and the alternative it was designed to replace. Chapter 3 presents a review of previous studies that had performed this direct comparison and Chapter 4 expands on this with further comparisons in a study of newly designed single-item measures and established multi-item measures.

3) To examine the validity of single-item measures as predictors of well-being outcomes and the benefits of the multi-dimensional approach.

In order to be useful as a well-being tool in practical applications, the single-item measures must be able to identify not only the degree of well-being but also what factors may be contributing to well-being outcomes. A potential benefit of single-item measures for this purpose is also that multiple factors can be accounted for in the same space as a multi-item measure of one factor. Single-item measures were therefore compared to multi-item measures in terms of the amount of variance predicted in well-being outcome scores, as well as the combined variance predicted by multiple factors measured using single-item measures compared to fewer factors measured more comprehensively using multi-item measures.

4) To apply the measures in practice to establish directly the practicality of the approach and its benefits and drawbacks in terms of application

As a part of the KESS project time was spent with Connect Assist to incorporate what had been learned into a practical tool that the business may use for well-being assessment. Chapter 6 discusses the relevance of the results to practical application based on time spent developing a well-being tool in their systems from the results of the research and the items developed.

5) To further develop the approach by examining the issues raised by application and research thus far.

Further research was performed to acknowledge and develop understanding of issues and limitations highlighted in the project. These included the generalisability of the results, the lack of analysis of more complex relationships suggested in the literature, and the assumption of causal relationships between predictor and outcome measures. This chapter acknowledges these limitations with further study based on university students as a basis for further developing the measurement approach created in the project.

1.3 Research Strategy

With these objectives in mind a research strategy was developed in order to achieve these goals.

1) The issues related to well-being and practicality would need to be identified through both academic and public sector sources. Governments and organisations concerned with well-being such as the Office for National Statistics and the World Health Organisation were expected to have valuable information on rates and issues on a large scale. Business-orientated publications such as Occupational Health at Work would also have the relevant focus for Connect Assist as well as more theoretical works regarding issues related to well-being. The approach to identifying and researching these sources was top-down, whereby government reports and well-being organisations reports were identified through google searches. These reports were also expected to contain references to other materials, for example international publications would provide reports from a national level. These reports were then filtered down into the specific academic papers that they referenced. The benefits of this approach are that an assumption can be made that high-level reports such as from the UK government would have already performed a thorough identification and audit of the research available, rather than simply repeating this process for an overview of the topic.

2) Single item measures were already in consideration as an alternative approach, however their efficacy was not fully understood. A systematic review of the evidence for single-item measures was required. As the single-item measures were intended as an alternative to currently used methods, particularly multi-item measures, the review of studies was intended to focus on how the single-item measures perform in direct comparison to these other approaches. This involved a review of studies that have directly compared the measures to each other in order to provide a direct comparison. A systematic approach to identifying these studies was used using search terms associated with the factors under consideration.

3) Once the existing evidence for single item measures is identified and evaluated, primary research was planned to assess the single-item measures in terms of the key characteristics of an appropriate well-being assessment tool. This plan involved the assessment of the psychometric properties of the items in terms of their validity and reliability in order to determine their suitability for the purpose. As the items would be

intended as replacements for multi-item measures, again this was planned to be performed as a direct comparison between the two approaches. A large-scale cross sectional study was considered appropriate for this and a sample that represents those that are closely related to Connect Assist's service users i.e. teachers and third sector employees, as well as one where previous research has shown well-being issues may be prevalent, was considered appropriate. An initial study of university staff followed by a confirmatory study in nurses was proposed considering these factors. The analytical approach was intended to follow traditional methods of assessing psychometric properties, validity in terms of the correlation between the new item and an established measure, reliability in terms of internal consistency estimates, and predictive validity using multiple regression analysis.

4) Stage 3 of the research was intended to provide the majority of the results for suggesting the suitability of the items. It is expected that other factors may arise during this stage of the research and a final study was proposed to account for these issues and to study further the suitability of the items. The exact nature of this final study would depend on the specific issues that arise throughout the course of the research or time with Connect Assist, however some possibilities proposed were extension to other groups and identifying changes in well-being, as the generalizability across groups and the ability to detect change were considered important aspects of a practical measure once the validity and practicality of the items was established. A longitudinal study was suggested as a possible approach to expanding on the research so far.

5) A period of time working with Connect Assist was already planned as part of the funding criteria and it was determined that the best use of this time would be to determine Connect Assist's requirements at the beginning of the project and to return later to establish the item's suitability for meeting these requirements in terms of practicality. A period of 3 months was set aside at early and later stages of the project for working with the company.

Chapter 2: Well-Being and practical measurement

As stated in Chapter 1, the first stage of the project was to identify the key issues related to well-being assessment in Connect Assist and similar organisations. This Chapter outlines these issues and the factors involved for an overview of the factors associated with well-being that are most relevant to the present context. These factors include how well-being is defined, the factors associated with well-being, and practicality issues. Finally, a practical approach is proposed with all of these factors in mind.

2.1 Defining well-being

Defining well-being is a relevant issue for the present project, as definitions may vary according to context. This section outlines the definition of well-being used in the current project, based on common themes in well-being research and policy.

Promoting well-being has been described as a major priority across Europe (Knapp, McDaid, Mossialos, & Thornicroft, 2006), within the UK (Waldron, 2010), and for employers (Black, 2008) but there is no universal definition of what well-being is (Anderson, Jané-Llopis, & Cooper, 2011). The following sections demonstrate how research suggests that well-being is the combination of a range of factors rather than a single entity.

2.1.1 Well-being as the absence of mental health issues
Well-being has traditionally been defined as the absence of ill health (Parkinson, 2007) and depression, anxiety, and stress are referred to as common mental health disorders that require attention in government publications focusing on well-being (Black, 2008).

The relevance of these negative mental health issues can be seen most clearly in health and economic statistics. According to the Labour Force Survey (LFS), stress, depression, and anxiety accounted for 428,000 (40%) of all cases for work-related illnesses in 2011/2012 (HSE, 2013). These factors caused workers in the UK to lose 10.4 million working days, with each person taking on average 24 days off work for these reasons, one of the highest average days lost per case in all health complaints covered in the survey. Further to this, it is suggested that many with these issues are going undiagnosed or untreated, presenting an important issue in well-being (Black, 2008). In terms of the economic impact of negative well-being, the Sainsbury Centre for Mental Health (SCMH, 2007) reports that the estimated total cost to employers of mental health problems among their staff is £26 billion each year, equivalent to £1,035 for every employee in the UK workforce, with £15.1 billion due to reduced productivity at work.

These statistics highlight the impact of negative well-being in the United Kingdom, however the figures are not unique to the region. The World Health Organisation (WHO) reports that mental health problems account for approximately 20% of the total burden of ill health in Europe, with depressive disorders making up nearly one third of all mental health problems, second only to cardiovascular disease in its contribution to the overall burden of illness (WHO, 2004a). The WHO report also suggests that mental health problems cost the economy at least 3-4% of total Gross National Product (GNP), with depression being associated with the highest level of economic costs due to the fact that it impacts many people who are often in employment. The total costs of adult depression in 2002 is reported to be 15.46 billion euros, with the vast majority of these costs related to lost employment due to absenteeism or increased mortality (WHO, 2004a).

Reducing the impact of negative mental health issues is therefore an important aspect of well-being from an individual, occupational, and international perspective.

2.1.2 Well-being as the presence of positive functioning

With mental health problems having such an impact on the economy and affecting such a large proportion of the population, it is not surprising that research has largely been focused on negative states (Diener, Suh, Lucas, & Smith, 1999). However it has since been acknowledged that early conceptualisations of well-being as the absence of distress were insufficient (McDowell, 2010) and positive well-being is now also considered an important element of well-being as a whole (Ryan & Deci, 2001; WHO, 2012).

Positive well-being is commonly represented broadly by happiness or quality of life (Ryan & Deci, 2001). The presence of positive well-being has been demonstrated as important in itself beyond the absence of negative well-being issues, not least as an important goal in life for people around the world (Diener, Kesebir, & Lucas, 2008). The implications of positive well-being have been most comprehensively reviewed by Lyubormisky, King, and Diener (2005), who present the correlational, longitudinal, and experimental evidence relating happiness (mainly in terms of positive affect) with factors such as job performance, material wealth, and mental and physical health. Correlational data showed that positive affect was associated with a range of positive outcomes related to work, social interactions, and physical health and longitudinal data showed that long and short-term happiness preceded other factors such as interview success, income, social relationships, physical well-being, and coping with cancer.

Creating positive functioning is therefore an important element of well-being and the presence of positive function is frequently acknowledged as a key element of well-being (Black, 2008; Diener, 2000; Smith, McNamara, & Wellens, 2004; Waldron, 2010; WHO, 2004a).

2.1.3 Subjective well-being

A subjective approach which avoids prescription of what is good for one's well-being and allows people's own perceptions to be considered has been described as important for well-being policy

by the Office for National Statistics (ONS) and the WHO in their publications (Waldron, 2010; Wismar, McKee, Ernst, Srivastava, & Busse, 2013). Subjective well-being (SWB) accounts for this by allowing respondents to consider their own values and goals when making their judgements, particularly in the form of satisfaction with life or specific domains.

SWB is defined as the presence of positive mood, absence of negative mood, and satisfaction with life or specific domains (Diener, 1984). Positive and negative mood (or affect) define the emotional aspect of SWB, while domain or life satisfaction judgments define the cognitive aspect of SWB.

Subjective judgements are also frequently acknowledged in discussion regarding the positive side of well-being and has become an important aspect of well-being research and policy (Diener, et al., 2008; Sin & Lyubomirsky, 2009; Waldron, 2010; Wismar, et al., 2013).

2.1.4 Well-being as the combination of factors

As positive, negative, and subjective experience each represent factors associated with well-being, it is expected that they would be somewhat related to each other, for example Cummins (2010)has suggested that depression results as the lack of SWB, and the lack of happiness and presence of stress have also been linked (Schiffrin & Nelson, 2010). Such results often lead to the use of different aspects of well-being interchangeably, such as the use of happiness to represent the whole concept of SWB (Diener, Oishi, & Lucas, 2003; Ryan & Deci, 2001; Schiffrin & Nelson, 2010).

However, while these aspects of well-being are related, evidence suggests that they are not interchangeable concepts. For example, Gargiulo and Stokes (2009) suggest that loss of SWB cannot account for all cases of depression and studies specifically examining the relationship among well-being variables have also shown that they are correlated but distinct. Previous research (e.g. (Headey & Wearing, 1989; Keyes, 2006)) has demonstrated that SWB measures are correlated but distinct from measures of mental health, such as depression, and Ried, Tueth, Handberg, & Nyanteh (2006) found a correlation of only -.28 between depression and SWB. Others have also suggested that not all those with depression may recognise it or wish to report it and therefore a measure of SWB may be useful for identifying those individuals (Gargiulo & Stokes, 2009).

Distinctions have also been shown between more closely related outcomes. Using multitrait-multimethod analysis, Lucas, Diener, and Suh (1996) also demonstrated the distinction between life satisfaction and the affective components of SWB, along with the existence of positive and negative affect as individual elements rather than two ends of the same spectrum. Busseri, Sadava, and DeCourville (2007) confirmed that while each component of SWB has common variance, they also have significant unique variance and the authors recommend that positive mood, negative mood, and satisfaction should be measured independently.

As a result, guidance on the assessment of well-being emphasises the combination of elements rather than a single well-being factor. For example, the WHO discourage defining well-being in a broad, general way (WHO, 2012), and research recommends that SWB be considered as a necessary but not sufficient element of well-being as a whole (Diener, Sapyta, & Suh, 1998). Other researchers have also suggested that SWB may be useful separately from mental health outcomes such as depression. Lee-Flynn and colleagues (Lee-Flynn, Pomaki, DeLongis, Biesanz, & Puterman, 2011) for example used negative mood as a short-term outcome and depression as a long term outcome and Cohen, Gunthert, Butler, O'Neill, & Tolpin (2005) have suggested that SWB may be beneficial as a pre-mental illness outcome.

2.1.5 Summary

While there is no specific definition of well-being therefore, common themes include the absence of mental health issues such as depression, anxiety, and stress, alongside positive experience such as positive mood or happiness and subjective judgments such as life satisfaction. Research and policy also emphasises the necessity to acknowledge these elements as important individual parts of a whole. A summary of this is demonstrated in the below definition of well-being from the New Economic Foundation:

> "Well-being can be understood as how people feel and how they function, both on a personal and a social level, and how they evaluate their lives as a whole. To break this down, how people feel refers to emotions such as happiness or anxiety. How people function refers to things such as their sense of competence or their sense of being connected to those around them. How people evaluate their life as a whole is captured in their satisfaction with their lives, or how they rate their lives in comparison with the best possible life."(Michaelson, Mahony, & Schifferes, 2012), p. 6.

23

While positive, negative, and subjective experience may be common themes in well-being definition, the exact factors within these themes that are considered as important for well-being can depend on context. National well-being indicators may include factors such as education and family life (WHO, 2012), while job satisfaction may be more appropriate for well-being at work. Alternative conceptualisations of positive well-being also exist, such as the eudaimonic perspective which places a greater emphasis on the prescriptive importance of factors such as attainment of goals and purpose in life (Ryan & Deci, 2001). While the exact definition of well-being may vary across applications, the key characteristics of well-being are that it is multi-faceted, with positive, negative, and subjective elements (Waldron, 2010, WHO, 2012). These recurring themes were therefore chosen as the definition for the current project.

The definition of well-being used in assessment or management therefore needs to acknowledge elements that contribute to positive functioning, mental health issues, and judgments of circumstances in order to represent well-being as a whole.

2.2 Factors associated with well-being

Many factors have been associated with well-being in different contexts, including situational and personal factors. This section summarises the key factors for the present context and the issues this may have for practical measurement.

2.2.1 Introduction

In order to manage well-being, research has aimed to determine which factors lead to well-being outcomes and, in parallel with definitions of well-being, the issues of context and individual but correlated components are also relevant here.

As the definition of well-being includes multiple components such as positive, negative, and subjective elements, the management of well-being also involves the combination of many individual factors (WHO, 2012). National accounts of well-being draw from a wide range of factors that may affect a population's positive functioning, for example the ONS well-being wheel includes a range of factors in the measurement of national well-being including measures of the natural environment, such as air pollution, and political factors such as trust in the national government (see http://www.ons.gov.uk/ons/guide-method/user-guidance/well-being/index.html). The European Social Survey also includes items relating to involvement with the community, involvement with family members, and individual factors such as income and self-esteem (Huppert et al., 2009).

While these indicators suggest a multi-faceted approach to well-being on a national level, as suggested above the exact variables of concern can depend on context. The workplace is also a primary context for well-being assessment and management (Black, 2008; Knapp, et al., 2006)and well-being on this scale is the focus of this thesis. On a smaller scale such as the workplace, variables such as air pollution levels may be less context-relevant. However, research on well-being at work also demonstrates that, even in this narrower context, multiple factors are involved.

2.2.2 Managing well-being in the workplace: Circumstances

As with the emphasis on recording negative well-being outcomes in those in employment, much of the research in this area has focused on addressing the factors that lead to depression, anxiety, and stress in the workplace. Two of the most influential models of well-being at work are the Job-Demands-Control (-Support) (JDCS) model (Johnson & Hall, 1988) and the Effort Reward Imbalance (ERI) model (Siegrist, 1996), both of which have been repeatedly tested and have support for their main hypotheses (Häusser, Mojzisch, Niesel, & Schulz-Hardt, 2010; Tsutsumi & Kawakami, 2004; Van Der Doef & Maes, 1999). The JDCS model is an extension of Karasek's (Karasek, 1979) Job-Demands-Control (JDC) model. In brief, the JDC model suggests that the combination of high job demands (e.g. a large workload or limited time allowance) and low job control (e.g. ability to decide how to do the work) lead to negative outcomes. The JDCS model expanded on this by adding the hypothesis that when the above relationship is also associated with low social support or isolation, the risk of negative effects is increased further. Although the model can be applied in different ways (for example with control or support as buffers), the job-strain (demands-control) and iso-strain (demands-control-support) hypotheses described above are more consistently supported (Van Der Doef & Maes, 1999). The ERI model is similar and complementary to the JDCS model, however the relationship of interest is that between effort (similar to demands described above) and reward (e.g. respect, financial reward, or opportunity for advancement) (Rydstedt, Devereux, & Sverke, 2007). The ERI model can be used to suggest that the combination of high effort and low reward leads to negative health outcomes, although more in-depth applications of the model can be used to distinguish between types of effort (e.g. extrinsic vs. intrinsic) or reward (e.g. esteem, financial, promotion prospects), or to consider the increased susceptibility of those who score highly on an over-commitment factor (Siegrist et al., 2004). The JDCS model and ERI model have both been associated with numerous outcomes such as general health, cardiovascular disease, life satisfaction, depression, and anxiety (Häusser, et al., 2010; Tsutsumi & Kawakami, 2004; Van Der Doef & Maes, 1999).

Alternative models and variables have also been proposed as approaches to well-being management in the workplace. A report published by the HSE, for example, identified 26 measures of psychosocial hazards in the workplace including measures of effort reward imbalance and demands and control. Other measures include factors such as role conflict and

ambiguity, hassles and uplifts, and skill variety and autonomy (Rick, Briner, Daniels, Perryman, & Guppy, 2001). A wide range of potential variables and measures are therefore available.

The Health and Safety Executive (HSE) management standards represent the current approach to identifying potential issues in the workplace and combines aspects of many of these models, measuring demands, control, managerial support, work colleague support, role, relationships, and change (Kerr, McHugh, & McCrory, 2009).The measure is designed with risk avoidance in mind and these individual stressors are considered to have a negative impact on employee well-being in organisations of all kinds of size and type (MacKay, Cousins, Kelly, Lee, & McCaig, 2004). The HSE MS is used by 64% of councils in the UK to tackle well-being (Purnell & Johnson, 2008).

2.2.3 Managing well-being in the workplace: Individual differences
Although the ERI model can include an over-commitment factor which accounts for individual differences in the propensity to experience effort-reward imbalance (Siegrist, et al., 2004), many work well-being models have been criticised for not accounting for factors beyond work characteristics, such as the coping style of the individual (A. P. Smith, et al., 2004).

Examples of individual differences

The concept of coping style is based on Lazarus' (1966) concept of the stress process as consisting of the primary appraisal of a threat, the secondary appraisal of a potential response to the threat, and the execution of that response (coping). A primary distinction is between problem-focused coping responses, which aim to alter the circumstances in order to reduce stress, and emotion-focused coping responses, which aim to reduce the negative feelings associated with the stressful situation (Carver, Scheier, & Weintraub, 1989). Problem focused strategies are expected to result in positive effects to well-being, while emotion focused strategies are expected to impair well-being, however more complex relationships depending on other individual variables have also been proposed (Tyson, Pongruengphant, & Aggarwal, 2002).

Another aspect of individual differences involved particularly in SWB is personality. In a meta analysis, DeNeve & Cooper (1998) found personality was a strong predictor of multiple well-being outcomes including positive and negative affect, happiness, and life satisfaction. The authors suggested that personality may be the major determinant of well-being but should also be considered alongside other factors, such as events and resources.

Individual differences research

While circumstances have been shown to be related to well-being outcomes, other research has therefore been designed to examine the effect of individual differences in well-being outcomes. Work by Smith and colleagues (Smith, Wadsworth, Chaplin, Allen, & Mark, 2009; Smith, et al., 2004; Mark & Smith, 2012;Mark &Smith, 2012; Mark & Smith, 2008) for example has proposed and supported the view that a combination of factors provides the best prediction. For

example, Smith et al (2009) found that when considering well-being as a process that involves multiple factors, such as job characteristics, coping style, perceived stress, and satisfaction, none of the individual components had the same prediction of well-being as the combination of scores. The inclusion of individual differences was beneficial alongside circumstances however, with all job characteristics and individual differences predicting 55%, 52%, and 57% of the variance in anxiety, depression, and job satisfaction respectively, compared with 28%, 19% and 20% for coping and attributional style alone. Others have also emphasised the importance of multiple factors including experiences, resources, personality, cognitions, and emotions (Cummins & Lau, 2005).

More complex theories, such as person environment fit theory, suggest that, rather than the direct effects of individual differences and circumstances on outcomes, the congruence between the individual and the environment results in better outcomes such as low stress (Thomas, Buboltz, & Winkelspecht, 2004). These theories include moderator or mediator relationships among variables such as the buffering hypothesis, which suggests that the effect of demands on outcomes varies according to the level of support or control the individual has, rather than each of these variables having independent direct relationships (Cohen & Wills, 1985). Individual differences such as personality may also interact with circumstances in that circumstances may be perceived differently by those with different personality traits such as higher neuroticism (DeNeve & Cooper, 1998). However, a literature review on well-being in the workplace found limited research on these types of interactions in this context (Smith, et al., 2009).

2.2.4 Relevance to well-being outcomes

Introduction

The specific outcome under consideration is also a relevant factor in developing a practical assessment tool. The above research has demonstrated that well-being definition involve multiple factors and factors associated with well-being are also diverse. When these two characteristics of well-being are combined, the topic becomes even more complex. The above research suggests that work characteristics and individual differences may contribute to well-being outcomes, however evidence suggests that the relative importance of each variable is dependent on which specific outcome is studied. Brief et al (Brief, Butcher, George, & Link, 1993) state that it should not be assumed that the relationship between any one pair of predictor and well-being outcome should be applied to another pair and this perspective is supported by research.

Examples of outcome dependent results

As described above, the HSE management standards includes a number of factors such as demands and support and research examining the performance of the management standards in 707 employees showed that the relevance of each factor varied according to outcome, with demands being most strongly associated with depression (standardized beta = -0.34) and anxiety

(-0.15) but not job satisfaction (0.05). In contrast, manager support demonstrated the strongest relationship with job satisfaction (0.45) but was not significantly related to job-related anxiety (-0.01) and only marginally associated with job related depression (-0.12) (MacKay, et al., 2004). This demonstrates differences in relationships even before individual differences are taken into account.

Examining the research of SWB further demonstrates these unique relationships, where personality rather than circumstances is considered to be the most significant predictor of well-being outcomes (Diener, 1996) and different aspects of personality have been associated with different aspects of well-being (DeNeve & Cooper, 1998). Albuquerque and colleagues (Albuquerque, de Lima, Matos, & Figueiredo, 2012) examined the relationships between the big 5 personality factors and affective and cognitive components of subjective well-being. Using a sample of 398 teachers of primary and high schools, they demonstrated that extraversion, neuroticism, and conscientiousness had significant relationships with each of the subjective well-being components and, furthermore, that the specific relationships differed between predictors. Using a 240-item questionnaire to measure personality (the NEO PI-R), the satisfaction with life scale, and positive and negative affect schedule for SWB, the results showed that neuroticism was the strongest predictor of negative affect, extraversion of positive affect, and all were significantly weaker predictors of life satisfaction.

Furnham, Petrides, Jackson, & Cotter (2002) found that personality was also not a strong predictor of job satisfaction. In 82 participants completing the Big Five Inventory and the Job Satisfaction Questionnaire (JSQ), the authors created 2 job satisfaction factors – hygiene and motivator. The hygiene factor included facets such as satisfaction with job security and work conditions, while the motivator factor included satisfaction with responsibility, interest, and opportunities for growth. Using multiple regression, overall the big 5 predicted 10% (adjusted) of the variance in the hygiene factor (f = 2.86, p < .05), and .7% (adjusted) of the variance in the motivator factor (f = 2.23, p > .05). When the 37 JSQ items were combined for total satisfaction, the regression equation was significant, with the independent variables accounting for about 11% of the total variance. Age and conscientiousness were significant predictors, indicating that younger and more conscientious employees reported greater overall job satisfaction. Overall though, personality was not a strong predictor and only conscientiousness predicted significant unique variance (Furnham, et al., 2002).

Differences between specific aspects of personality have also been shown. In their meta analysis, DeNeve & Cooper (1998) found that neuroticism was the strongest predictor of negative affect, happiness, and life satisfaction, while extraversion and agreeableness were associated with positive affect and conscientiousness was the strongest positive correlate of life satisfaction.

2.2.5 Summary
Research on well-being at work therefore suggests that multiple variables contribute to well-being in this context and it is the combination of variables that provides the best prediction of

outcomes, although a variety of theories and models exist as to which specific variables should be involved and how these variables relate to well-being. Even in the narrower context of the workplace, well-being management is therefore a complex issue.

A recurring theme in well-being research is also the multi-faceted nature of well-being and its contributory factors, where the specific relationships between predictor variables and outcomes may vary dependent on the characteristics of each. This has implications for well-being management in that employers or human resource professionals must account for a variety of factors and cannot generalise results from one relationship to another.

Broadly speaking, research suggests that circumstances may be more important for cognitive appraisals such as life satisfaction or job satisfaction, as these aspects of well-being are intended to represent a judgment of one's situation (Pavot & Diener, 1993), while personality is most frequently discussed in terms of its relationship with positive and negative mood (Costa & McCrae, 1980). However, the above results also demonstrate differences within these variable groups, with particular aspects of personality or circumstances associated with different outcomes.

In order to assess well-being and identify potential causes, it is necessary identify problems (Black, 2008). Research on the topic indicates that, in order to do so, associations between multiple elements including circumstances, individual differences, and multiple outcomes must be accounted for. Although the specific relevant contribution of these variables to each well-being aspect is not fully understood, research indicates that well-being consists of the associations between multiple factors.

2.3 Practicality issues

Practicality issues are a primary concern of organisations with limited resources such as Connect Assist. This section summarises the specific practicality issues that can arise in well-being assessment and are relevant to the present context.

2.3.1 Introduction
While the multi-faceted nature of well-being has been demonstrated in research and a multi-faceted measurement approach is recommended, the complexity of well-being has implications for assessment in terms of the practicality of measuring so many different constructs. The above research highlights that measuring only one aspect of well-being and generalising to others will provide misleading results and this has been warned against by others (e.g. (Lucas, et al., 1996)). Therefore, if the intention is to improve well-being, it is necessary to identify which of the potential causes of well-being in a particular group is relevant to a specific well-being outcome. For example, in practice a multi-dimensional approach to well-being assessment may indicate

that increased control may provide a well-being improvement for some individuals (Sparks, Faragher, & Cooper, 2001), while training to improve low self-esteem or optimism may benefit others (Chang, Wang Li, & Liu, 2011; Lee-Flynn, et al., 2011) but these conclusions may be dependent on which specific well-being outcome is relevant, where each are correlated but also contain unique variance. However, if well-being can potentially be affected by a variable combination of these factors, as research suggests, then identifying which is relevant to a specific individual or group is important in order to reduce wasted resources on misapplication of interventions where they are inappropriate. At the same time, this also creates potential to create issues related to the practicality of such an approach.

2.3.2 Questionnaire length and response burden
It has been stated that no single questionnaire accounts for all aspects of even work related stress (Edwards, Webster, Van Laar, & Easton, 2008) and, with stress making up only one aspect of well-being, it is clear that measuring well-being in the above described way involves the use of multiple, potentially lengthy questionnaires, while issues related to practically, complexity, cost, time, and response burden are all important in practice.

The practical implications of questionnaire length and response burden are numerous. Lengthy questionnaires and low response rates can have an impact on the validity of responses as length increases due to volunteer bias (Roth & Bevier, 1998), increased use of the modal response category (Kraut, Wolfson, & Rothenberg, 1975), or identical responses for all items (Herzog & Bachman, 1981). A number of studies have suggested that response rates decline with questionnaire length, for example Dillman, Sinclair, & Clark (1993) showed that question simplicity and questionnaire length can improve response rates by 8-10 percent overall (see also Yammarino, Skinner, & Childers, 1991). Galesic & Bosnjak (2009) found that more respondents started a questionnaire and more respondents finished the questionnaire when they believed it would last 10 minutes compared to 30 minutes and this was the case even in unemployed participants, who presumably have more time to spare than those in employment. Others have suggested that a completion time of 13 minutes or less is an ideal length (Handwerk, Carson, & Blackwell, 2000).

While employees may be an important focus of the impact of negative well-being, research has also suggested that response rates to organisational studies have been declining over time and, while response enhancing techniques such as incentives may have compensated for this trend, the efficacy of many of these techniques has also declined significantly (Anseel, Lievens, Schollaert, & Choragwicka, 2010). These trends also demonstrate that response rates also depend on the respondent group within organisations, with response rates decreasing as responsibility increases, for example with top executives having lower response rates than consumers or managers (Anseel, et al., 2010). This may reflect the impact of response burden in applied settings, with those with more demanding roles having less time available to complete surveys. The combination of these trends along with the issues surrounding lengthy questionnaires therefore means that measuring well-being is considered to be costly in practice (SCMH,

2007)and as a result accurate assessment, as an important step in the improvement of well-being, is difficult, especially in organisations with limited resources.

As a result, well-being assessment can be inadequate. Schimmack, Oishi, Furr, & Funder (2004) report that a complete assessment of the big 5 can take 45 minutes and this leads to researchers not including personality measures unless they are specifically interested in it, with inclusion itself extending a questionnaire to longer than the 13 minutes recommended by Handwerk et al, (2000) . Drolet and Morrison (2001) also discuss the issue that when the number of questions is limited, using multi-item measures limits the number of constructs that can be measured. This has implications in the case of practical application, where research has demonstrated that multiple factors can be an important predictor of well-being and neglecting to measure some factors potentially reduces the ability of a measure to correctly assess well-being issues. In the context of research this is also an issue; Smith et al (Smith, et al., 2009) suggest that research "frequently fails to control or consider the range of variables that are clearly important" (p12) and rarely accounts for multiple influential characteristics.

2.3.3 Summary
While research has indicated the importance of accounting for multiple dimensions, measuring more dimensions in practice has an exponential relationship with the length of a questionnaire due to each dimension being assessed by multiple items. This has further implications for response rates, response burden, and time consumption, which is likely to result in fewer variables being measured as well as potentially harming the validity of the results.

2.4 Developing a practical approach

With the above factors in mind, a practical approach is developed to create a well-being assessment tool that can account for the multiple dimensions of well-being discussed above and also prevent the practicality issues. This sections summarises previous approaches and the approach taken for the current project.

2.4.1 Introduction
The issue of measuring multiple dimensions in a single questionnaire while maintaining practical considerations is not new and multiple measures have been developed for brief well-being assessment on large scales.

2.4.2 Examples
The WHO 5, for example, takes 1-2 minutes to answer and includes 5 items relating to positive well-being including feeling relaxed or in good spirits (McDowell, 2010). The ONS in the Integrated household survey used 4 questions regarding satisfaction with life, feeling that what you do is worthwhile, happiness, and anxiety to measure subjective well-being nationally (Self, Thomas, & Randall, 2012) .

Even briefer measures have been developed such as The Arizona integrative outcomes scale (Bell, Cunningham, Caspi, Meek, & Ferro, 2004), which is a visual analogue scale designed to represent overall well-being over the past 24 hours or past month in medical applications, simply by marking a point on a line between 'worst you have ever been' and 'best you have ever been'. Other research has assessed well-being more comprehensively and used single-item measures to reduce the impact of multiple factors on the length of the questionnaire. For example, the well-being module of the European Social Survey is considered to be the most comprehensive measure of international SWB (Waldron, 2010) and contains multiple single-item measures such as "All things considered, how satisfied are you with your life as a whole nowadays?" and "Taking all things together, how happy would you say you are?" (Huppert, et al., 2009).

The use of single-item measures for factors such as life satisfaction or job satisfaction is also found in occupational psychology research (Smith, Johal, & Wadsworth, 2000; Smith, et al., 2009) for consumer perceptions in marketing research (Viswanathan, Bergen, Dutta, & Childers, 1996) and for quality of life in population surveys and clinical settings (Bowling, 2005; Sloan et al., 2002).

2.4.3 Limitations for well-being

One limitation of these measures however is that they are primarily used for monitoring well-being levels and do not identify potential causes for well-being issues or targets for intervention, making them incomplete tools for well-being management in practice. Shorter measures for the identification of such causes also exist but are typically longer. For example, the brief version of the DCSQ and the brief version of the ERI are 16 and 32 items long respectively (Sanne, Torp, Mykletun, & Dahl, 2005; Siegrist, et al., 2004) and the brief COPE (Carver, 1997) is designed for reduced impact on questionnaire length and is 28 items.

As has been demonstrated, it is the combination of such factors that is likely to provide the best prediction of well-being outcomes and, despite the existence of brief versions of many measures, even these versions, when combined, can create an impractical number of questions. For example, the management standards itself as a measure of only workplace factors contains 35 items, combined with brief versions of coping style (the brief COPE (28 items) (Carver, 1997)), personality (Saucier mini markers (40 items) (Saucier, 1994)), as well as stress (pss-4 item(Sheldon Cohen & Lichtenstein, 1990; S Cohen, Williamson, Spacapan, & Oskamp, 1988)), positive and negative affect (I-PANAS-SF (Thompson, 2007) 10 items), and life satisfaction (SWLS 10 items (Diener, Emmons, Larsen, & Griffin, 1985)) creates a total of 127 items.

Furthermore, a range of potential questionnaires exist for each construct, for example for personality there exists among others the NEO, NEO-PI-R, NEO-FFI, EPQ, EPQ-R and EPQ-R-S (Steel, Schmidt, & Shultz, 2008) and therefore an organisation willing to address well-being may feel that the process of selecting measures is too complex.

2.4.4 Creating practical measurement in the present context

The ability to measure well-being accurately in the multi-dimensional way suggested by research is therefore limited in applied settings by the practicality of such an approach.

This issue is particularly relevant to small businesses like Connect Assist, who provide online and telephone based support to working adults including teachers, nurses, and other third sector staff (see www.connectassist.co.uk). The services and clients of Connect Assist demonstrate that many working adults with well-being issues such as stress are provided support through online and telephone based services and therefore the above example of a 127 item questionnaire is impractical.

This issue is not limited to Connect Assist, however, and the use of similar services is growing (Alleman, 2002). The aim of this thesis therefore is to research and develop a well-being assessment tool that aims to balance the understanding of well-being gained from research as described in this chapter with the practical constraints of well-being management in applied settings, providing a brief measure that includes important variables in one place without being impractically lengthy and complex.

2.4.5 A simple well-being model for applied settings

As described above, well-being can be conceptualised in a variety of ways and a variety of models have been used in applied settings, such as the workplace, to manage and predict well-being outcomes. Although a common theme throughout is the importance of multiple variables, the exact variables involved and how they relate is not fully understood and application is likely to be dependent on context.

The context of this thesis is practical measurement in organisations where resources are limited, with a small online and telephone based social enterprise providing the primary example. Simplicity is therefore important so that the measure can be easily administered with time available to score and analyse results in mind, however this also has to be balanced with the ability of the measure to perform the task of well-being assessment and prediction.

2.4.6 The DRIVE model: A simple framework

The issue of balance between complexity and simplicity in well-being assessment has been previously discussed by Mark & Smith (2008). In this paper the authors suggest that an ideal approach would allow for the model to account for circumstances, individual experiences, and subjective perceptions without too much complexity. Their proposed basic model included factors from the DCS model, the ERI model, coping behaviours, and attributional explanatory styles as well as outcomes including anxiety, depression, and job satisfaction. These variables were categorised as work demands, work resources (e.g. control, support), individual differences (e.g. coping style, attributional style), and outcomes, although the model is intended as a

framework into which any relevant variables can be applied (Mark & Smith, 2008) . This simple model (the DRIVE model) proposed direct effects on outcomes by each of the other variable groups, as well as a moderating effect of individual differences and resources on demands. A more complex version (the enhanced DRIVE model) was also developed to acknowledge a subjective element and includes perceived stress as well as further interactive effects. Research using the DRIVE model has supported the direct effects of these variable groups on outcomes, although little to moderate support was found for interactions (Mark & Smith, 2008). Stronger support of direct effects compared to interactions has also been found in research on other models such as the DCS model, where review has shown that the buffering effect of control and support had less evidence than the direct effects of these variables on outcomes (Van Der Doef & Maes, 1999).

The drive model provides a convenient balance between the complexity of a model that covers multiple factors as has been suggested is the preferred method of well-being conceptualization, and the simplicity of a model that can be applied in practice in environments with limited training and resources available.

Although simpler models exist, such as the JDCS, this does not have the complexity to include multiple factors such as individual differences. Similarly, while other models such as person-environment fit model do include multiple factors, the application of those factors is more complex and therefore limits their practicality for untrained users.

The DRIVE model includes multiple factors such as circumstances and individual differences, can be applied simply in terms of direct relationships and cumulative effects, and can also be easily adapted simply by adding or removing factors relevant to the circumstances they are applied to.

The DRIVE model therefore provides a suitable model for the application of the single-item approach.

2.4.7 Relevance to the present context

Taking into consideration the definition of well-being as a multi-faceted construct with independent but correlated elements, as described above, the DRIVE model provides a good basis for research on a simple practical measure of the well-being process. In terms of relationships, the DRIVE model proposes and supports direct effects of multiple aspects (demands, resources, individual differences) on well-being outcomes. The use of direct effects rather than complex interactions among multiple variables is preferable for a practical well-being measure in order to maintain simplicity in interpretation and analysis for those with limited resources. While the model also allows for interactive effects, in the current context moderating

effects do not have consistent support and may add unnecessary complexity. Similarly, while a mediating effect of stress on other well-being outcomes has been proposed in the enhanced DRIVE model, many of these effects were found to be only partial (Mark & Smith, 2008) .

Application of the DRIVE framework in the current context therefore did not initially include the interaction pathways. The inclusion of the appraisal of stress in the enhanced DRIVE model was to account for subjective experience (Mark & Smith, 2008) and would already be included in a measure to account for the role of stress in well-being policy as an important outcome in itself such as in the Labour Force Survey and as the focus for government research (HSE, 2013; Kerr, et al., 2009; MacKay, et al., 2004; Rick, et al., 2001). Rather than increasing the complexity of a simple, practical tool with an interactive effect therefore, stress was maintained in the framework as a cognitive appraisal outcome in itself that is associated with other well-being outcomes. In this way, stress would represent a cognitive well-being component similar to the role of satisfaction as a cognitive component of SWB (Diener, 1984). The direct effects required to represent a mediating effect therefore will still be acknowledged with stress as a result of appraisal of circumstances and a correlated but distinct element of well-being as a whole. Using the DRIVE model in this way therefore accounts for the definition of well-being in research and policy including associated but independent elements as described at the beginning of this chapter.

The use of the simple DRIVE model in this way also provides a basic foundation for development of a measurement tool, in that, while it is acknowledged that more complex interactions may be at work in well-being, we can ensure that the tool first is established as suitable for assessing the direct and most consistently supported variables and effects. The rationale for this is that there is a vast array of potential interactions between demands, resources, and individual differences and accounting for each of these would increase the complexity and reduce the practicality of the measure. At the same time, each of the variables involved have direct effects that are more consistently supported and therefore the measurement tool must most importantly identify these. This is particularly relevant in the case of mediation, where direct effects are part of the criteria for a mediated interaction (Baron & Kenny, 1986). Establishing the ability for a practical measure to initially assess the variables and direct relationships involved would maintain practicality while providing a foundation for any further application that intends to include interactive effects. Once this is established, further research could examine the further contribution of interactive relationships where appropriate.

2.4.8 Adjustment to the present context
The simple DRIVE model is presented below. It was stated that the main effect relationships were supported by research, although the moderating effects received little to moderate support (Mark & Smith, 2008). As stated above, the enhanced version of this model included perceived stress, which was found to have direct relationships with demands and with outcomes and it was

suggested that the model can incorporate relevant variables such as bullying or self-esteem. Based on this, and the above research on well-being outcomes and predictors, the application of the model for the research in this thesis is presented in Figure 2 below. This model is intended to acknowledge the multi-dimensional nature of well-being, to provide a tool to measure well-being outcomes as well as identify potential causes of these outcomes from a variety of possible causes. A focus is placed on direct effects to maintain a simple enough model that can be easily understood and applied by employers and focuses on the most strongly and consistently supported relationships. This provides a basis therefore to measure well-being in such a way that is recommended by policy and by Mark & Smith (2008) that accounts for multiple factors while not being too complex.

In the present application, the model now includes personality measures, as it has been suggested that personality is a significant predictor of emotional well-being (Diener, et al., 2003;Costa & McCrae, 1980; Dolan, Peasgood, & White, 2008) and that taking into account personality is important for increasing well-being (Diener, 2000). The application here also includes SWB more directly with satisfaction, positive affect, and negative affect as separate components as recommended by research (Diener,Suh, Lucas, & Smith, 1999) and these outcomes combine with stress, depression, and anxiety as the most commonly assessed negative aspects of well-being. While these outcomes are measured individually, they can also be conceptually grouped in terms of positive, negative, cognitive, and emotional distinctions, and more broadly as aspects of well-being as a whole. As a result, the present application provides a simpler but broader approach to well-being than the original DRIVE model, for the benefit of practical application with limited resources, although an increased potential for redundant variables is acknowledged.

Figure 2.1: Original simple drive model variable groups with example variables
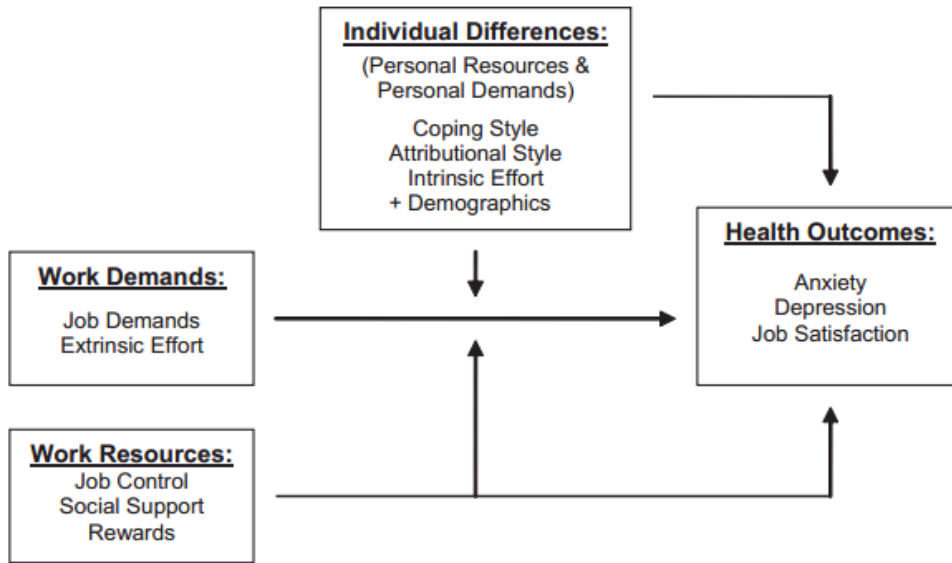
Figure 1: Simple DRIVE Model

Figure 2.2: Adapted DRIVE model with variable groups and example variables
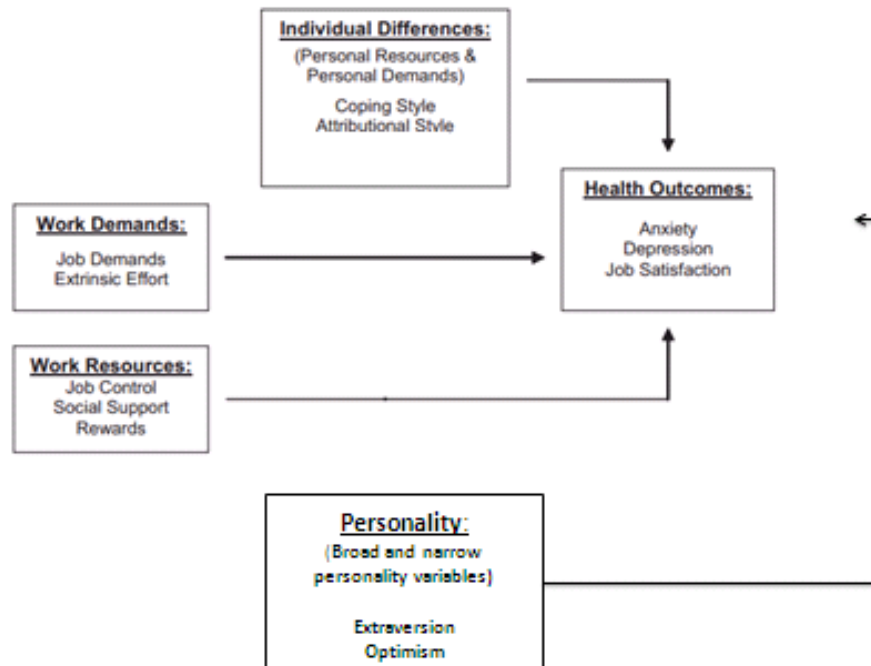
2.4.9 Single-item measures

Introduction

While the DRIVE model provides an appropriate practical framework that can be used for development of a practical measure of well-being in applied settings, such as the workplace, measurement of such a model using current measures still requires an impractical number of items. For example, in research using this model, questionnaire length was 104 items (Mark & Smith, 2012) and the revised model suggests the addition of personality related variables and a more diverse range of outcomes. As well as using a simple model for well-being in the context of this thesis, single-item measures are therefore also proposed for the measurement of this model in order to manage the length of the questionnaire.

Limitations

The practical benefits of single-item measures are obvious, where more variables can be measured in less space, or well-being can be assessed in situations where practical limitations make traditional methods of assessment impossible. However, with the reduction in the number of items to measure a construct, other issues are raised where practicality issues are solved. These issues are mainly related to validity and reliability assurances which using multiple items

provide. The first such issue is related to reliability, where random error (representing variance that does not reflect the true response score) is expected to be cancelled out by combining multiple items related to the same variable. Cronbach's alpha is the most common test of reliability and estimates are directly linked to the number of items in a measure, rendering the reliability of a single-item immeasurable in this way and creating a perception that, if it could be measured, it would be unacceptably low (Wanous & Hudy, 2001).

Since validity is limited by reliability (Nunnally, 1978), this also creates potential issues for single-item measures to provide accurate representations of well-being outcomes and, furthermore, an inaccurate test also cannot provide a good predictor measure (Nunnally, 1978).

Risk/benefit balance

Research has indicated that the above concerns may not be valid (Wanous & Hudy, 2001) and it should also be noted that the practical advantages of single-item measures have the potential to reduce the risk to validity in other ways. For example, while random error variance is expected to be cancelled out in multi-item measures, non-random error variance, for example social desirability in personality measures, may be increased (Woods & Hampson, 2005). This issue may be compounded where the same question is asked multiple times with only small differences in wording, which increases alpha scores without adding information (Drolet & Morrison, 2001). This can result in measures, including those of well-being variables such as positive and negative affect, that have been criticised in the past for including items that inflate reliability (Thompson, 2007). Other risks to validity and reliability previously discussed in relation to the effect of long scales on response rates and patterns are also reduced by using single-item measures by their reduction of response burden.

The use of single-item measures therefore must be considered on balance and appropriate to the context. Guidance by Cronbach (1990) seems particularly relevant to this issue:

> "The tester who needs several facts about the individual may prefer to obtain somewhat unreliable answers to all these questions rather than to measure one dimension precisely and remain without information on the others. While no general rule can be given as to the best division of limited testing time, it is clear that the greatest amount of time should be given to the most important questions. Where there are several questions of about equal importance, it is definitely more profitable to use a brief test giving a rough answer to each one than to use a precise test which answers only one or two questions."

Similarly, Schimmack et al (2004) suggest that if precision is at a premium, then it is worthwhile including more dimensions even if this may involve redundancy in terms of shared variance and that the optimal number of dimensions will depend on the importance of precision in the use for which they are applied. In the case of identifying well-being and associated issues in practice, it

is necessary to be able to identify variables that would benefit from intervention where multiple associations are possible and therefore identifying the specific focus of intervention is important.

2.5 Final summary

This chapter described the complexity of well-being and issues this can create for well-being management. First, well-being is defined as the combination of multiple associated variables, with negative, positive, and subjective elements each considered independent parts of a whole. Factors associated with well-being were also described as a process which involves the combination of multiple variables, including circumstances and individual differences, with the importance of these variables varying in relation to different well-being outcomes. The practical implications of this complexity was described in terms of the impact this may have on well-being assessment in applied settings where restrictions in terms of time, costs, and response burden limit the length and complexity of measures that may be used, creating a barrier for the application of research findings in practice. Finally, a simple, single-item approach to removing this barrier was proposed to enable a multi-dimensional approach to well-being with limited resources.

Applying the above guidance to the current issue of practical measurement of well-being, it may therefore be more beneficial to measure multiple factors associated with the well-being process with single-item measures, rather than use the limited time and space for longer measures of fewer factors. Single-item measures therefore provide a possible solution that allows the complex nature of well-being to be represented in well-being assessment where resources are limited. However, while they are often used in large scale epidemiological studies, their suitability for measurement of many of the variables involved in models of smaller scale well-being, for example the workplace, has not been thoroughly examined. As a result of this, while organisations are expected to manage well-being (Black, 2008), many of the measures available to them do not include a range of important variables (e.g.HSE, 2004) or are impractically long (Huppert, et al., 2009). This thesis aims therefore to examine the suitability of single-item measures in a simple model for bridging the gap between the recommended approach to well-being assessment and the practical limitations of applied settings. The results of this research will be presented in five stages:

Stage 1: Review of studies comparing single- and multi-item measures of well-being. This review presents research which has directly compared single- and multi-item measures in order to determine what previous research has shown about how well single-item measures can represent well-being constructs compared to traditional multi-item measures.

Stage 2: A test of the validity of responses on single-item measures, in comparison to established multi-item measures of the same variables. Methods are also used to estimate the reliability of the single-item measures and to examine the diagnostic validity of these measures in determining high and low well-being groups.

Stage 3: A test of the predictive validity of single-item measures. This stage examines the variance predicted in well-being outcomes by well-being predictor variables measured using single- and multi-item approaches. A hierarchical approach to analysis is taken to compare and contrast the practical benefit of being able to measure more variables with single-item measures against the more comprehensive assessment of fewer measures using the multi-item approach.

Stage 4: A description of an application in applied settings. This stage presents a report of the development of a well-being assessment tool in Connect Assist, an online and telephone based support centre. The practical suitability of an approach based on the findings of the research are explored in terms of how they could be applied in practice using modern software.

Stage 5: Confirmation and extension of findings in student samples. This stage confirms the results of previous chapters in a new sample to examine the generalisability and reliability of conclusions and extends the understanding of the approach in terms of the longitudinal nature of the relationships and the potential for interactive effects.

Chapter 3: Review of studies showing direct comparisons between single- and multi-item measures of the same constructs

3.1 Background

The previous chapter demonstrated that well-being is a multi-dimensional construct, with positive, negative, and subjective elements which each have unique contributions to well-being as a whole. It was also established that these elements of well-being have multiple associated predictor variables and that the combination of these variables provides the best prediction of outcomes. However, this multi-dimensional approach combined with lengthy questionnaires is impractical and has potential implications for response burden and subsequent threats to response rates and data validity.

Single-item measures were highlighted as a solution which may allow a multi-faceted approach to be applied with reduced impact on practicality by acting as replacements for multi-item measures. As a basis for further research on this potential solution therefore, the current chapter explores how accurately a single-item measure may perform as a replacement for an established measure.

3.1.1 The use of single-item measures in practice
Single-item measures have been used in a range of applications, most notably in medicine where response burden is an important issue. Most commonly these measures are used to rate factors such as quality of life, general health, pain or fatigue in those with chronic illness. For example, the use of single-item measures for these factors has been studied in those with rheumatoid arthritis (Harrison, Boonen, Tugwell, & Symmons, 2009), HIV (Crane et al., 2006), cancer (Ahles, Ruckdeschel, & Blanchard, 1984; Butt et al., 2008), and multiple sclerosis (Parkin, Rice, Jacoby, & Doughty, 2004). Single-item measures have also been used in psychiatric applications such as the assessment of alcohol abuse (Dawson, Pulay, & Grant, 2010), fear (Denkinger, 2011; Rushford, 2006; Scheffer, Schuurmans, Vandijk, Van Der Hooft, & De Rooij, 2010) and withdrawal (Tompkins et al., 2009) as well as in general daily practice (Strasser, Muller-Kaser, & Dietrich, 2009).

Single-item measures in this domain have provided useful results. For example, Hoeppner et al (Hoeppner, Kelly, Urbanoski, & Slaymaker, 2011) compared a single and multi-item measure of self-efficacy for abstinence in 303 young adults receiving treatment for substance use ("How confident are you that you will be able to stay clean and sober in the next 90 days, or 3 months?" (p 307) compared to a 20 item version. They found that the single-item measure was a more effective and more consistent predictor of relapse than the 20 item version after 1 month, 3

months, and 6 months, recommending the approach where practicality is important. Nichols & Webster (2013) also recommended a single-item measure for measuring the need to belong, whether resources are limited or not. Across a number of studies, the single-item need to belong measure and the 10-item scale showed strong correlations with each other (mean .70), and similar correlations with other measures such as negative affect and social anxiety. After correcting for attenuation, correlation between the single and multi-item measure was .97, suggesting that almost all the reliable variance in the multi-item measure is captured by the single-item.

In the current context of occupational settings, single-item measures have also been used in practice in tasks such as hiring, promotion, and intention to quit (Wanous & Hudy, 2001) as well as for research purposes. Smith et al (2000), for example, used a single-item stress measure in a large scale study involving 3945 respondents and demonstrated associations between stress and a range of factors including hours of work, environmental factors such as noise, and other health factors such as blood pressure and errors in memory. A cohort study also demonstrated that those in the high stress group had significantly higher scores on the Occupational Stress Indicator. Scarpello & Campbell (1983) recommended that a single-item measure of global job satisfaction was preferable to scales that summed satisfaction of various job domains, suggesting that the single global item allows the respondent to draw on elements that may not be specifically referred to in multiple individual items. Single-item measures are therefore commonly used where practical restrictions, such as response burden or limited time, necessitate their use.

3.1.2 Current chapter

Although the above examples provide evidence for the utility of single-item measures, as discussed in Chapter 1 there are validity and reliability concerns that are frequently used to discourage the use of single-item measures. With this in mind, if single-item measures are to be incorporated into a new practical approach to well-being measurement then the first issue to consider is whether single-item measures can accurately represent the constructs under investigation. Single-item measures may be more susceptible to some forms of error (see Chapter 2 for a discussion) and it is important to establish that the use of single-item measures to improve practicality would not do so at a severe detriment to accuracy of data. Although other psychometric properties of a measure are also important, such as reliability over time or predictive validity, these properties may exist for a measure even if it is not assessing the construct in question. It is necessary therefore to first establish that the items are measuring what they are intended to measure in order to determine their suitability for well-being management specifically and also to establish what previous research has shown regarding this issue as a basis for how any newly developed items should perform.

Based on this rationale, the current chapter presents a review of research which has directly compared single-item and established measures of well-being constructs, thus presenting evidence for the ability of single-item measures to provide similar data to the established measures in the specific domain of well-being assessment. Although other aspects of single-item

measures are important, this review is concerned only with the validity of single-item measures in representing well-being constructs as a basis to support the development of new single-item measures, where further issues such as predictive validity and reliability can be assessed for the developed measures specifically.Further to this, the validity of the scores was also chosen as the primary basis of the review based on the facts that reliability is secondary to validity (Nunnally, 1978) and is rarely measured for single-item measures (Wanous & Hudy, 2001), and predictive validity in one domain does not necessarily equate to other domains (Nunnally, 1978).

3.1.3 Search Criteria

As discussed in the previous chapter, the range of well-being associated variables is vast and the appropriate variables are dependent on context. For the purpose of this review and based on the context provided in Chapter 2, the search criteria includes general well-being terms (such as "quality of life"), specific positive and negative well-being outcomes (such as "depression" and "happiness"), demands (e.g. "work load"), resources (e.g. "social support") and individual differences (e.g. "personality" and "coping behaviour") . The search was performed on Psychinfo and Scopus databases and a complete search criteria is presented below (specific syntax refers to the Ovid search engine).

1. single-item.m_titl.

2. visual analogue.m_titl.

3. 2-item.m_titl.

4. brief scale.m_titl.

5. brief measure.m_titl.

6. well being/ or life satisfaction/ or mental health/ or positive psychology/ or "quality of life"/

7. exp Emotional States/ or exp Happiness/ or exp Satisfaction/

8. exp "Depression (Emotion)"/

9. exp Anxiety/

10. personality/

11. exp Work Rest Cycles/ or exp Work Load/ or exp "Quality of Work Life"/ or exp Work Scheduling/ or exp Work Week Length/ or exp "Work (Attitudes Toward)"/ or exp "Noise Levels (Work Areas)"/ or exp Family Work Relationship/ or exp Work Related Illnesses/

12. exp Self Esteem/

13. exp Self Efficacy/

14. exp Optimism/

15. exp Social Support/

16. exp Stress/ or exp Coping Behavior/

17. exp "Experiences (Events)"/ or attributional style.mp.

18. 1 or 2 or 3 or 4 or 5

19. 6 or 7 or 8 or 9 or 10

20. 11 or 12 or 13 or 14 or 15 or 16 or 17 or 19

21. 20 and 18

22. Limit 21 to English Language

Seventy-six unique articles were identified using this search method. On further examination of the content, 6 articles were removed for not including a single-item measure, 11 were removed for not comparing to an established measure, 3 were removed for being a review rather than a primary study, and 35 were removed for not being related to well-being. Twenty-one articles were included in the final review.

Table 3.1: Summary of studies showing sensitivity and specificity of single-item measures in comparison with established methods

Author	Year	Variable	Single-item measure	Response Scale	Established comparison	Multi-Item Alpha	Sample Size	Age	Sensitivity (%)	Specificity (%)
Watkins et al	2007	Depression	Do you often feel sad or depressed?	Yes/ No	Semi Structured Interview	n/a	122, 65 male	Median 74	86	84
Watkins et al	2007	Depression	Do you often feel sad or depressed?	Yes/ No	Semi Structured Interview	n/a	91 (3 month follow-up)		95	89
Ayalon et al.	2009	Depression	Do you think you suffer from depression	Not at all (1) - Certainly yes (5)	Structured clinical interview	n/a	153	Mean: 75	83	83
Ayalon et al.	2009	Depression	Single-item from PHQ-9	Not at all (1) - Certainly yes (5)	Structured clinical interview	n/a	153	Mean: 75	83	94
Ayalon et al.	2009	Depression	Single item from MDI	Not at all (1) - Certainly yes (5)	Structured clinical interview	n/a	153	Mean: 75	67	92
Ayalon et al.	2009	Depression	Single item from SCID-I	Not at all (1) - Certainly yes (5)	Structured clinical interview	n/a	153	Mean: 75	100	97
Skoogh et al.	2010	Depression	Are you depressed?	Yes or I don't know vs. No	Hospital Anxiety and Depression Scale (HADS) Depression Component (7 items)	.70-.90	974 Male	20-74, mean: 41	88	84
McCormack et al	2010	Depression	"In the past 4 weeks have you often felt sad or depressed?"	Yes/No	Geriatric depression scale (15 items)	0.79	191 (24.1% male)	65-97, mean 79	69	72
Pantilat et al.	2012	Depression	How would you rate the worst depression you have now	No depression (0) - Worst depression you can imagine (10)	Geriatric Depression Scale (GDS) (15 items)	0.79	162 total	65-96, mean: 77	44	83
Pantilat et al.	2012	Depression	How would you	No depression	Geriatric	0.79	162	65-96,	69	61

			rate the worst depression in the past 24 hours	(0) - Worst depression you can imagine (10)	Depression Scale (GDS) (15 items)		total	mean: 77		
Pantilat et al.	2012	Depression	If you were to use words to describe your worst depression now, would you say it was	None, Mild, Moderate, Severe	Geriatric Depression Scale (GDS) (15 items)	0.79	162 total	65-96, mean: 77	66	60
Pantilat et al.	2012	Depression	If you were to use words to describe your worst depression in the past 24 hours, would you say it was	None, Mild, Moderate, Severe	Geriatric Depression Scale (GDS) (15 items)	0.79	162 total, 87 male	65-96, mean: 77	81	40
Mitchell et al	2012	Distress	Visual Analogue Scale (Emotion Thermometers)	0 (none) to 10 (extreme)	HADS Total Score (14 items)	Not reported	200, (62% male)	22-91 (mean 62)	85	76
Mitchell et al	2012	Depression	Visual Analogue Scale (Emotion Thermometers)	0 (none) to 10 (extreme)	Major Depression Inventory ()	Not reported	200, (62% male)	22-91 (mean 62)	73	90
Mitchell et al	2012	Anxiety	Visual Analogue Scale (Emotion Thermometers)	0 (none) to 10 (extreme)	Generalized Anxiety Disorder Assessment (GAD) (7 items)	Not reported	200, (62% male)	22-91 (mean 62)	85	84

Table 3.2: Summary of studies showing correlations between single-item measures and established methods

Author	Year	Construct of concern	Single-item measure	Response Scale	Established comparison	Multi-Item Alpha	N	Age	Correlation
Luria	1975	Depression	Visual Analogue Scale	'Worst Mood' to 'Best Mood'	Self Rating Depression Scale	Not reported	62	20-70	-0.56
Luria	1975	Mood	Visual Analogue Scale	'Worst Mood' to ' Best Mood'	Clyde Mood Scale (Friendliness subscale)	Not reported	62	20-70	0.44
Luria	1975	Mood	Visual Analogue Scale	'Worst Mood' to ' Best Mood'	CMS (Aggressiveness)	Not reported	62	20-70	0.02
Luria	1975	Mood	Visual Analogue Scale	'Worst Mood' to ' Best Mood'	CMS (Clear Thinking)	Not reported	62	20-70	0.48
Luria	1975	Mood	Visual Analogue Scale	'Worst Mood' to ' Best Mood'	CMS (Sleepy)	Not reported	62	20-70	-0.39
Luria	1975	Mood	Visual Analogue Scale	'Worst Mood' to ' Best Mood'	CMS (Unhappy)	Not reported	62	20-70	-0.65
Luria	1975	Mood	Visual Analogue Scale	'Worst Mood' to ' Best Mood'	CMS (Dizzy)	Not reported	62	20-70	-0.4
Russell & Mendelsohn	1989	Affect (Pleasure and Arousal)	Please rate how you are feeling right now	2 Dimensional Grid	Positive and Negative Affect Schedule (PANAS) Positive Component	0.87	162 College Students	Not reported	0.62
Russell & Mendelsohn	1989	Affect (Pleasure and Arousal)	Please rate how you are feeling right now	2 Dimensional Grid	PANAS Negative Component	0.79	162 College Students	Not reported	0.48
Bernhard et al.	2001	Mood	Visual Analogue Scale - 'Mood'	0-100	Mood Adjective Checklist (71 items)	Not reported	84	31-75, m 56	0.71
Robins et al	2001	Self Esteem	I have high self esteem	5 point scale	Rosenberg Self Esteem Scale (10 items)	.88-.90	496, 44% male	Undergraduate Students	0.75
Robins et al	2001	Self Esteem	I have high self esteem	5 point scale	Rosenberg Self Esteem Scale	.88 - .90	208 (39% male)	Undergraduate Students	0.74
Robins et al	2001	Self Esteem	I have high self	7 point scale	Rosenberg Self	.88 - .90	208	Undergraduate	0.73

			esteem		Esteem Scale		(39% male)	Students	
Robins et al	2001	Self Esteem	I have high self esteem	5 point scale	Rosenberg Self Esteem Scale	.88 - .90	66	21-61,median 44	0.8
Sagrestano et al.	2002	Anxiety	Do you feel very anxious	Yes/No	State component of State-Trait anxiety inventory	0.84	166 Female	14-41, mean 25	.24**
Sagrestano et al.	2002	Depression	Do you often feel depressed	Yes/No	Center for epidemiological studies depression scale	0.9	166 Female	14-41, mean 25	.31***
Sagrestano et al.	2002	Depression	Do you often feel alone	Yes/No	Center for epidemiological studies depression scale	0.9	166 Female	14-41, mean 25	.41**
Sagrestano et al.	2002	Stress	Do you feel under constant pressure	Yes/No	Perceived Stress Scale (PSS) – 14 (14 items)	0.78	166 Female	14-41, mean 25	0.15
Sagrestano et al.	2002	Stress	Do you often feel unable to cope	Yes/No	PSS - 14	0.78	166 Female	14-41, mean 25	.19*
Tamiya et al.	2002	Anxiety	Visual Analogue Scale - 'Anxiety'	Not at all 0 - 100 As much as it could be	Taylor Manifest Anxiety Scale	Not Reported	145 Female	28-76, M 53	.29*
Tamiya et al.	2002	Anxiety	Visual Analogue Scale - 'Anxiety'	Not at all 0 - 100 As much as it could be	Delusion Symptom Status Inventory (Anxiety subscale)	Not Reported	145 Female	28-76, M 53	.35**
Tamiya et al.	2002	Depression	Visual Analogue Scale - 'Depression'	Not at all 0 - 100 As much as it could be	Delusion Symptom Status Inventory (Depression subscale)	Not Reported	145 Female	28-76, M 53	.53***
Tamiya et al.	2002	Depression	Visual Analogue Scale - 'Depression'	Not at all 0 - 100 As much as it could be	Zung Self Rating Depression Scale	Not Reported	145 Female	28-76, M 53	.50***
Nagy	2002	Satisfaction with work	Not reported	'Not at all satisfying' – 'Very satisfying'	Job Descriptive Index (work facet)	0.83	207	19-60, mean 34	0.65
Nagy	2002	Satisfaction with pay	How does (facet) compare to what you	'Not at all satisfying' – 'Very satisfying'	JDI (pay facet)	0.84	207	19-60, mean 34	0.72

				think it should be?					
Nagy	2002	Satisfaction with promotions	How does (facet) compare to what you think it should be?	'Not at all satisfying' – 'Very satisfying'	JDI (promotions facet)	0.86	207	19-60, mean 34	0.6
Nagy	2002	Satisfaction with supervision	How does (facet) compare to what you think it should be?	'Not at all satisfying' – 'Very satisfying'	JDI (supervision facet)	0.89	207	19-60, mean 34	0.7
Nagy	2002	Satisfaction with co-workers	How does (facet) compare to what you think it should be?	'Not at all satisfying' – 'Very satisfying'	JDI(co workers facet)	0.9	207	19-60, mean 34	0.64
De Boer et al	2004	Quality of Life	Visual analogue scale	Worst imaginable (0) - Perfect (100)	Medical Outcome Studies SF 20 (20 item) Mental Health Subscale	Not reported	83, 86% male	44-78, M 64	0.63
De Boer et al	2004	Quality of Life	Visual analogue scale	Worst imaginable (0) - Perfect (100)	RSCL Psychological Functioning (40 items)	Not reported	83, 86% male	44-78, M 64	0.45
Rohland et al	2004	Burnout	Classify your level of burnout using your own definition of burnout	1 'I enjoy my work. I have no symptoms of burnout' – 5 'I feel completely burned out and often wonder if I can go on. I am at the point where I may need some changes or may need to seek some sort of help'	Maslach Burnout Inventory Human Services Survey (emotional exhaustion subscale)	0.85	307 (78 female)	Mean 44	0.64

Woods & Hampson	2005	Extraversion	Indicate how much you think each description sounds like you	Undesirable pole (1) - Desirable Pole (9)	BFI (44 items)	Mean .83	377, 16% male	Mean 20	0.79
Woods & Hampson	2005	Agreeableness	Indicate how much you think each description sounds like you	Undesirable pole (1) - Desirable Pole (9)	BFI (44 items)		377, 16% male	Mean 20	0.74
Woods & Hampson	2005	Conscientiousness	Indicate how much you think each description sounds like you	Undesirable pole (1) - Desirable Pole (9)	BFI (44 items)		377, 16% male	Mean 20	0.66
Woods & Hampson	2005	Emotional Stability	Indicate how much you think each description sounds like you	Undesirable pole (1) - Desirable Pole (9)	BFI (44 items)		377, 16% male	Mean 20	0.66
Woods & Hampson	2005	Openness	Indicate how much you think each description sounds like you	Undesirable pole (1) - Desirable Pole (9)	BFI (44 items)		377, 16% male	Mean 20	0.65
Woods & Hampson	2005	Extraversion	Indicate how much you think each description sounds like you	Undesirable pole (1) - Desirable Pole (9)	BFI (44 items)		205 , 59% male	Mean 32	0.77
Woods & Hampson	2005	Agreeableness	Indicate how much you think each description sounds like you	Undesirable pole (1) - Desirable Pole (9)	BFI (44 items)		205 , 59% male	Mean 32	0.46
Woods & Hampson	2005	Conscientiousness	Indicate how much you think each description sounds like you	Undesirable pole (1) - Desirable Pole (9)	BFI (44 items)		205 , 59% male	Mean 32	0.51
Woods & Hampson	2005	Emotional Stability	Indicate how much you think each description sounds like you	Undesirable pole (1) - Desirable Pole (9)	BFI (44 items)		205 , 59% male	Mean 32	0.59
Woods & Hampson	2005	Openness	Indicate how much you think each description sounds like you	Undesirable pole (1) - Desirable Pole (9)	BFI (44 items)		205 , 59% male	Mean 32	0.49

Woods & Hampson	2005	Extraversion	Indicate how much you think each description sounds like you	Undesirable pole (1) - Desirable Pole (9)	BFI (44 items)		209, 25% male	Mean 28	0.8
Woods & Hampson	2005	Agreeableness	Indicate how much you think each description sounds like you	Undesirable pole (1) - Desirable Pole (9)	BFI (44 items)		209, 25% male	Mean 28	0.67
Woods & Hampson	2005	Conscientiousness	Indicate how much you think each description sounds like you	Undesirable pole (1) - Desirable Pole (9)	BFI (44 items)		209, 25% male	Mean 28	0.78
Woods & Hampson	2005	Emotional Stability	Indicate how much you think each description sounds like you	Undesirable pole (1) - Desirable Pole (9)	BFI (44 items)		209, 25% male	Mean 28	0.75
Woods & Hampson	2005	Openness	Indicate how much you think each description sounds like you	Undesirable pole (1) - Desirable Pole (9)	BFI (44 items)		209, 25% male	Mean 28	0.63
Woods & Hampson	2005	Extraversion	Indicate how much you think each description sounds like you	Undesirable pole (1) - Desirable Pole (9)	TDA 100	Mean .87	377, 16% male	Mean 20	0.66
Woods & Hampson	2005	Agreeableness	Indicate how much you think each description sounds like you	Undesirable pole (1) - Desirable Pole (9)	TDA 100		377, 16% male	Mean 20	0.49
Woods & Hampson	2005	Conscientiousness	Indicate how much you think each description sounds like you	Undesirable pole (1) - Desirable Pole (9)	TDA 100		377, 16% male	Mean 20	0.64
Woods & Hampson	2005	Emotional Stability	Indicate how much you think each description sounds like you	Undesirable pole (1) - Desirable Pole (9)	TDA 100		377, 16% male	Mean 20	0.57
Woods & Hampson	2005	Openness	Indicate how much you think each description sounds like you	Undesirable pole (1) - Desirable Pole (9)	TDA 100		377, 16% male	Mean 20	0.41

Woods & Hampson	2005	Extraversion	Indicate how much you think each description sounds like you	Undesirable pole (1) - Desirable Pole (9)	TDA 35	Mean .83	377, 16% male	Mean 20	0.74
Woods & Hampson	2005	Agreeableness	Indicate how much you think each description sounds like you	Undesirable pole (1) - Desirable Pole (9)	TDA 35		377, 16% male	Mean 20	0.54
Woods & Hampson	2005	Conscientiousness	Indicate how much you think each description sounds like you	Undesirable pole (1) - Desirable Pole (9)	TDA 35		377, 16% male	Mean 20	0.67
Woods & Hampson	2005	Emotional Stability	Indicate how much you think each description sounds like you	Undesirable pole (1) - Desirable Pole (9)	TDA 35		377, 16% male	Mean 20	0.57
Woods & Hampson	2005	Openness	Indicate how much you think each description sounds like you	Undesirable pole (1) - Desirable Pole (9)	TDA 35		377, 16% male	Mean 20	0.39
Woods & Hampson	2005	Extraversion	Indicate how much you think each description sounds like you	Undesirable pole (1) - Desirable Pole (9)	Mini Markers (40 items)	Mean .80	377, 16% male	Mean 20	0.67
Woods & Hampson	2005	Agreeableness	Indicate how much you think each description sounds like you	Undesirable pole (1) - Desirable Pole (9)	Mini Markers		377, 16% male	Mean 20	0.45
Woods & Hampson	2005	Conscientiousness	Indicate how much you think each description sounds like you	Undesirable pole (1) - Desirable Pole (9)	Mini Markers		377, 16% male	Mean 20	0.65
Woods & Hampson	2005	Emotional Stability	Indicate how much you think each description sounds like you	Undesirable pole (1) - Desirable Pole (9)	Mini Markers		377, 16% male	Mean 20	0.46
Woods & Hampson	2005	Openness	Indicate how much you think each description sounds like you	Undesirable pole (1) - Desirable Pole (9)	Mini Markers		377, 16% male	Mean 20	0.47

Woods & Hampson	2005	Extraversion	Indicate how much you think each description sounds like you	Undesirable pole (1) - Desirable Pole (9)	Overall		791, 30% male	Mean 25	0.76
Woods & Hampson	2005	Agreeableness	Indicate how much you think each description sounds like you	Undesirable pole (1) - Desirable Pole (9)	Overall		791, 30% male	Mean 25	0.54
Woods & Hampson	2005	Conscientiousness	Indicate how much you think each description sounds like you	Undesirable pole (1) - Desirable Pole (9)	Overall		791, 30% male	Mean 25	0.62
Woods & Hampson	2005	Emotional Stability	Indicate how much you think each description sounds like you	Undesirable pole (1) - Desirable Pole (9)	Overall		791, 30% male	Mean 25	0.56
Woods & Hampson	2005	Openness	Indicate how much you think each description sounds like you	Undesirable pole (1) - Desirable Pole (9)	Overall		791, 30% male	Mean 25	0.51
Bagley	2005	Self esteem	"I have high self esteem"	Never (1) to often (4)	Rosenberg self esteem scale (10 item)	Not reported	61	Undergraduate students	0.76
Bagley	2005	Self esteem	"I have high self esteem"	Never (1) to often (4)	Coopersmith Self esteem Scale (23 item)	Not reported	61	Undergraduate students	0.71
Zimmerman et al.	2006	Global Quality of life	In general, how would you rate your overall quality of life during the past week?	Very good (0) - Very bad (4)	Diagnostic Inventory of Depression Quality of life subscale (6 items)		1256 (38% male)	18-79, 37	0.7
Zimmerman et al.	2006	Psychosocial Functioning	Overall, how much have symptoms of depression interfered with or caused difficulties in your life during	Not at all (0) - Extremely (4)	DID Psychosocial Functioning Subscale (6 items)		1256 (38% male)	18-79, 37	0.7

			the past week?						
Zimmerman et al.	2006	Depression Severity	Rate the current level of severity of your symptoms of depression during the past week	None (0) - Severe (4)	Clinically Useful Depression Outcome Scale (16 items)		562 (34% male)	18-80, mean 44	0.78
Littman et al	2006	Ability to handle stress	"On a scale of 1 to 6, how would you rate your ability to handle stress?"	I can shake off stress (1) to stress eats away at me (6)	Perceived Stress Scale 4 (4 items)	Not reported	218, 51% male	50-76	0.37
Littman et al	2006	Amount of Stress	"In the past year, how would you rate the amount of stress in your life (at home or at work)?"	No stress (1) to Extreme Stress (6)	Perceived Stress Scale 4 (4 items)	Not reported	218	50-76	0.34
Denissen et al	2008	Extraversion	Bipolar rating	'Extraverted, enthusiastic' – 'Reserved, quiet'	BFI (44 items)	0.83	205	Undergraduate students	0.68
Denissen et al	2008	Agreeableness	Bipolar rating	'Critical, quarrelsome' – 'Sympathetic, warm'	BFI (44 items)	0.76	205	Undergraduate students	0.59
Denissen et al	2008	Conscientiousness	Bipolar rating	'Dependable, self-disciplined' – 'Disorganized, careless'	BFI (44 items)	0.86	205	Undergraduate students	0.66
Denissen et al	2008	Emotional Stability	Bipolar rating	'Anxious, easily upset' – 'Calm, emotionally stable'	BFI (44 items)	0.88	205	Undergraduate students	0.7
Denissen et al	2008	Openness	Bipolar rating	'Open to new experiences, complex' – 'Conventional,	BFI (44 items)	0.82	205	Undergraduate students	0.68

				uncreative'					
Lesage	2011	Stress	Visual analogue scale	Not reported	PSS 14	Not reported	260 (49% male)	38-41 (mean 40)	0.68
Pantilat et al.	2012	Depression	How would you rate the worst depression you have now	No depression (0) - Worst depression you can imagine (10)	Geriatric Depression Scale (15 items)	0.79	162 total, 87 male	65-96, M 77	0.37
Pantilat et al.	2012	Depression	How would you rate the worst depression in the past 24 hours	No depression (0) - Worst depression you can imagine (10)	Geriatric Depression Scale (15 items)	0.79	162 total, 87 male	65-96, M 77	0.34
Pantilat et al.	2012	Depression	If you were to use words to describe your worst depression now, would you say it was	None, Mild, Moderate, Severe	Geriatric Depression Scale (15 items)	0.79	162 total, 87 male	65-96, M 77	0.27
Pantilat et al.	2012	Depression	If you were to use words to describe your worst depression in the past 24 hours, would you say it was	None, Mild, Moderate, Severe	Geriatric Depression Scale (15 items)	0.79	162 total, 87 male	65-96, M 77	0.29

3.2 Discussion

Research articles were reviewed to determine the degree to which single-item measures have been found to accurately represent constructs involved in the well-being process, on the basis that providing a valid indicator of a construct is the fundamental characteristic of a measure of that construct, with the intention to reveal the appropriateness of the single-item approach as a key feature of a practical well-being tool. The results involved a variety of well-being associated variables and single-item measures were assessed based on the accuracy of their scores compared to a variety of more comprehensive measures. The method of assessing the validity of scores was mainly by correlating them with scores on already validated measures of the same constructs, but for outcome measures the ability for the single-item measure to accurately identify those with or without a diagnosis of depression, anxiety or other outcome was also investigated. This method is known as diagnostic validity, with the percentage correctly identified as having a positive diagnosis referred to as sensitivity and those correctly identified as not having a positive diagnosis referred to as specificity. The appropriateness of the single-item approach based on the results of these studies is discussed below for each of the variables included in the review.

3.2.1 Well-being Outcomes

Depression and anxiety

Results from sensitivity/specificity studies mainly consist of depression and anxiety measures, with distress (depression + anxiety) also shown. Sixteen comparisons are provided and a range of comparison measures are used, including general depression and anxiety measures (Hospital Anxiety and Depression Scale), those for specific groups (Geriatric Depression Scale), and clinical interview.

Sensitivity ranged from 44 to 100 percent across all samples. Pantilat et al (2012) found, using a single-item scale of 1-10 for rating "the worst depression you have now", that 44% were correctly identified as depressed (scored 6 or more on the Geriatric Depression Scale (GDS)) using a cut-off of 5 or more on a 10-point scale. Using this cut-off provided the greatest specificity at 83%. The maximum sensitivity achieved using the item was 69% at a cut-off of greater than or equal to 1, however this obviously had implications for specificity which then fell to 50%.

On the other side of the spectrum, Ayalon et al (Ayalon, Goldfracht, & Bech, 2010) found the most favourable sensitivity/specificity results of 100% and 97% when comparing a single item from the structured clinical interview to the interview as a whole. This study compared the single and multi-item approach to the 'gold standard', a structural clinical interview for depression and

also compared a number of alternative single-item and multi-item measures to interview. A simple "Do you think you suffer from depression?" question with a 5 point response scale provided a sensitivity and specificity of 83%, while a single depression item from the 9-item PHQ and the 12-item MDI provided sensitivity ratings of 83% and 67%, with specificity at 94% and 92% respectively. In comparison, the complete scale of the PHQ and the MDI had equal-to or worse sensitivity (67% for the PHQ and 83% for the MDI) and marginally greater specificity (98% in both cases). In general, therefore, the single-item measures were comparable to the multi-item alternatives and were generally preferable for identifying those with depression as diagnosed by structured clinical interview. The exceptional findings using the single-item of the structured clinical interview also indicate that the apparent utility of a single-item measure may depend on how closely linked it is with the comparison measure. The authors conclude that a single-item measure can suffice for detecting the presence or absence of depression, although a longer scale is preferable for detecting severity or monitoring symptoms over time (Ayalon, et al., 2010).

A similar finding in comparison to clinical interview was also found in Watkins et al (2007), who examined the use of a single-item depression screener in those who were in hospital following a stroke but who did not have severe cognitive or communication problems. The yes/no item "Do you often feel sad or depressed?" provided a sensitivity and specificity of 86% and 84% respectively when both measures were administered at the same time and 95% and 89% when time 1 single-item response was compared with interview 3 months later. This provides further support for a single-item screening tool when compared against clinical interview and the authors conclude that the results compare favourably to those found in longer multi-item measures such as the HADS and Beck Depression Inventory (BDI) (Watkins, et al., 2007).

The comparison measure for the single-item versions vary across studies and many of the poorer end of the sensitivity/specificity findings are compared to the geriatric depression scale (McCormack, et al., 2011; Pantilat, et al., 2012) which is a 15 item scale with a reliability of .79. However, although the use of structured clinical interview often results in the highest sensitivity and specificity ratings for the single-item measures, studies with sensitivity and specificity above .80 are also found when compared to questionnaires such as the Hospital Anxiety and Depression Scale (HADS) and the Generalized Anxiety Disorder Scale (GAD) (A. J. Mitchell, et al., 2012; Skoogh, et al., 2010). Skoogh et al (2010) for example found sensitivity and specificity of 88% and 84% for a single-item when compared to the 7-item depression component of the HADS. While therefore single item measures compared favourably compared to clinical interview for identification of depression from 83% (Ayalon, et al., 2010) to 86% (Watkins, et al., 2007), comparison against questionnaire measures including the HAD total score, GAD (Mitchell, et al., 2012) and HAD-D also presented good results of .76% to 88%. The results in general therefore suggest that single-item measures can provide results that are comparable to

those that would be found for depression and anxiety screening by a variety of other, longer measurement approaches.

Studies using sensitivity/specificity analysis demonstrate the desire to use a simple screening tool where response burden is an issue, as well as the usefulness of such a tool for initial screening in elderly and ill participants, with many of the samples in care or recovering from illness. Overall, the findings compare favourably with the suggested sensitivity of greater than 0.8 and specificity of greater than 0.6 required of a good screening measure (Watkins, et al., 2007). Nine out of 15 samples met both of these criteria with only 3 meeting neither. Four of these lower-performing results were from the same sample of 162 chronically ill patients aged 65-96 and compared to the GDS (Pantilat, et al., 2012).

Single-item measures of depression and anxiety have also been compared to others using correlation analysis and many results show moderate to low correlations. For example, (Tamiya, et al., 2002) showed correlations of visual analogue scales compared to multi-item measures of .53 and .50 for depression and .35 and .29 for anxiety. Zimmerman et al (2006) however found a correlation of .78 between single and multi-item measures of depression in a sample of over 500, suggesting that strong correlations are possible and, when considered alongside the screening ability demonstrated in diagnostic validity studies, single-item measures present good potential for practical well-being measurement, most notably when compared to the 'gold standard' of clinical interview.

Mood

Russel, et al (1989) used a 2 dimensional grid for assessing pleasure and arousal in comparison with the PANAS. Respondents marked on a grid how they were feeling at the time in relation to one axis referring to pleasure and the other to arousal, essentially creating a measure of 2 facets using a single-item. Scores on the measure correlated .62 with the positive component of affect and .48 with the negative component in 162 college students. Using a visual analogue mood scale, Bernhard, et al (2001) assessed a single mood item in comparison to the Mood Adjective Checklist. With a smaller (84) and older (mean 56) sample, the correlation between measures was .71. Due to the differences in sample between these two studies it is difficult to determine what may account for the difference in correlations, however it has been suggested by others (Scarpello & Campbell, 1983) that a single-item measure should refer to a unidimensional construct, and the results therefore may indicate that the 2-dimensional grid approach works less well than a more unidimensional visual analogue response. However a recurring theme throughout the results in this review is the similarities between the single-item measure and comparison and the 2-dimensional grid may not have corresponded as well with a traditional

questionnaire as a visual analogue scale. The results do, however, indicate that single-item mood measures can be comparable to longer measures, although the evidence is limited.

Quality of life/Life Satisfaction

Zimmerman et al (2006) assessed global quality of life and psychosocial functioning single-item measures, the latter referring to the perceived impact of depression symptoms on life in the past week. These two comparisons represent the largest samples in the review at over 1200 in both cases and also a broad range of respondents aged from 18-79 with a mean of 37. Correlations between 5-point single item responses were .70 for each, compared with quality of life and psychosocial functioning subscales of the Diagnostic Inventory of Depression (6 items each). These comparisons represent correlations between closely matched single- and multi-item measures and provide a comparatively strong correlation, compared to other studies, at .70.

Global quality of life single-item measures were also assessed by De Boer et al (2004). In a sample of 83 mostly male respondents with a mean age of 64, the correlation between a visual analogue single-item and the Medical Outcome Studies 20-item mental health subscale was .63, while the correlation with the same single-item and the RSCL psychological functioning subscale was .45. Again, having only two studies with dissimilar samples may be the cause of the discrepancy in the strength of the relationships between single- and multi-item measures of quality of life. However, in this case the much larger sample of Zimmerman et al (2006) can be considered more representative as a whole. Further supported by these studies of quality of life is the importance of how closely matched the single- and multi-item versions are. De Boer, et al (2004) compared quality of life single-item measures to measures of mental health and psychological functioning, while Zimmerman et al's (2006) single- and multi-item measures both referred directly to quality of life and psychological functioning respectively. This may therefore account for a smaller correlation in De Boer et al (2004) and as in the case of sample size, Zimmerman et al's (2006) methods are likely to provide more accurate results and provide evidence for valid use of single-item measures for this variable.

Stress

Similarly to other studies, a visual analogue mood scale of stress correlated well with the PSS 14 at .68 (Lesage & Berjot, 2011). However, Sagrestano et al (2002), who had found low correlations for depression and anxiety items (below .41), also found low correlations of .15 and .19 for single yes/no items referring to 'feeling under constant pressure' and 'feeling unable to cope' respectively, also compared to the PSS-14. Also compared to the PSS, but the 4 item version, Littman et al (2006) found that a single-item 6-point measure of ability to handle stress was correlated .37 with the multi-item counterpart, while a rating of amount of total stress in the past year was correlated .34.

Considering these studies in relation to those already discussed, the contrast between the single- and multi-item versions again appears to be a potential influence on results. Lesage et al (2011) and Sagrestano et al (2002) both used the PSS-14 as a comparison measure, however Sagrestano (2002) demonstrated the weakest correlations with the PSS using a yes/no response regarding feeling pressure and ability to cope, while Lesage et al found the strongest correlation of the set (.68) using a visual analogue scale of stress directly. This may again demonstrate the importance of the design of the measure, with a yes/no response not directly referring to amount of stress and providing a less accurate result when compared to the PSS-14 than a more sensitive, direct rating of stress used by Lesage (Lesage & Berjot, 2011). Littman et al's (2006) design of the single-item measure can be considered between the two studies in this regard, with a 6 point scale, rather than a yes/no or 100-point visual analogue response, which rates ability to handle stress or amount of total stress in the past year and produces a correlation between that of the Sagrestano (2002) and Lesage (2011) studies (.37).

Although the Lesage and Littman studies are not directly comparable due to the different comparison measure, they do provide similar samples. Lesage used 260 respondents, 50% male, with a mean age of 40. The sample in Littman et al (2006) was similar to Lesage (2011), with 218 respondents, 51% male, aged 50-76. In the case of stress, the older participant group (Littman's) did not provide the strongest single-/multi-item comparisons, as was found in the case of mood, and the comparable samples suggest that the difference in correlations reported is more likely to be due to the relationships between the single- and multi-item measures. Sagrestano et al (2002) used 166 female respondents with a mean age of 25, potentially accounting for some of the difference in findings. However, when considered alongside other studies reported so far, the relationship between the single- and multi-item versions assessed appears again to be of greater importance.

3.2.2 Predictors of well-being

Burnout

One study (Rohland, et al., 2004) examined a single-item measure of burnout, finding a correlation of .64 between a single 5 point scale and the Maslach Burnout Inventory in 307 respondents. While this is a positive result for a single-item measure of burnout, whether this would hold across a variety of populations with potentially different conceptualisations of the construct is questionable, as the respondents were allowed to use their own definition of burnout. The results may therefore be highly variable depending on how burnout is conceptualised across demographic groups or based on knowledge or experience.

Personality

Next to depression and anxiety, personality is another factor that has a number of single-item measures developed for its measurement, most likely due to the length that personality measures can commonly reach and the ubiquitous nature of personality itself.

Personality related variables generally compare well with multi-item comparisons, including extraversion with correlations of .79 and .80 (Woods & Hampson, 2005), .77 (Bagley, 2005), and .76 (Bernhard, et al., 2001), while self esteem also provides strong correlations at .75 (Robins, et al., 2001) and .80 (Woods & Hampson, 2005). Other personality related variables also have high correlations, for example agreeableness at.74 (Bernhard) and conscientiousness at .78 (Bagley). These provide promising indications for the use of single-item measures in well-being assessment as single-items seem to provide valid comparisons to some much lengthier scales of these abstract constructs.

The research on single-item measures of personality also provides useful comparisons across different multi-item measures. Woods and Hampson (2005) compared a bipolar single-item for each of the big 5 personality variables against the 44 item BFI, the 100 item TDA, the 35 item TDA and the 40 item Mini Markers. The average correlation across these comparisons, providing a total sample of 791 participants, ranged from .51 (openness) to .76 (extraversion), indicating that some constructs may be more accurately captured using a single-item measure than others. Extraversion appears to be the most consistently well represented construct, correlating .79, .77, and .80 across 3 samples using the 44 item BFI as a comparison. Other variables however do not have the same consistency, agreeableness for example correlating .74, .46, and .67 across the 3 same studies and conscientiousness .66, .51, and .78. A separate study by (Denissen, et al., 2008) also compared a bipolar response scale to the 44 item BFI and found correlations ranging from .59 (agreeableness) to .70 (emotional stability), with openness and extraversion both correlating .68 with their multi-item counterparts. Comparing to a more comprehensive multi-item measure (the TDA 100) does not improve the results, with the average correlation being .55, compared to .58 for the TDA 35 and .54 for the 40-item Mini Markers. These comparisons also have the advantage of using the same sample of 377 participants and therefore no clear evidence of a link between the correlation that has been found and the comprehensiveness of the multi-item measure can be suggested. Rather, the results suggest that the specific variable is important and the greater consistency found for extraversion and found in the university sample Denissen (2008) suggests that this may be related to how familiar or well understood the construct is to the respondents.

Single-item measures of self esteem have also been compared to multi-item measures and have demonstrated some of the strongest relationships, ranging from .73 to .80 compared to the Rosenberg self esteem scale in a total of over 750 respondents in 3 samples Robins et al (2001). Bagley (2005) also compared to the Rosenberg self esteem scale and found a correlation of .76 as well as a correlation of .71 with the longer 23 item Coopersmith self esteem scale in the same

sample of 61 undergraduate students. This consistency in self-esteem comparisons lends further support to the conclusion that some constructs compare better with the multi-item comparisons than others.

3.3 Conclusions

The purpose of this review was to establish the extent to which single-item measures can accurately represent the constructs relevant to psychological well-being by examining studies that had directly compared single-item measures to established methods. This review presents the comparisons from a number of variables represented using a single-item measure compared to multi-item measures and in some cases clinical interview. Sample size and comparison group varied among the studies and positive results have been shown in samples of a range of sizes, demographics, and circumstances. The results overall suggest that the single-item approach itself is not a barrier to accurate representation of a construct, however they also suggest that the potential for a single-item measure to perform adequately should not be generalised to all variables; instead, each measure should be individually validated.

3.3.1 The roles of item, comparison, and respondent

The evidence suggests that the assessment of well-being using single-item measures can provide similar results to multi-item measures, although some variables show consistently strong relationships while others show varying results across studies.

An important aspect of this variability in findings may be the way in which the single-item measure is designed in comparison to the multi-item measure. When using a multi-item measure, the researcher is able to draw together scores on the individual elements of a construct and create a score for the construct as a whole for each respondent. When using a single-item measure (e.g. "Are you depressed?"), the researcher is asking the respondent to bring together these elements on their own and come up with an overall judgment of the construct. With no guaranteed common understanding of each element to bring together, the researcher must hope that the respondent is using a correct understanding of the terms and the relevant elements. It follows therefore that the respondent's understanding of the variable in question is a key factor in the accuracy of the single-item measure and this may be reflected in the results, for example with extraversion having the most consistently high correlations potentially due to being a more commonly understood construct than other big 5 variables. While this is a speculation at this stage, the suggestion relates to those previously made by (Jenkins & Taber, 1976), that the accuracy of the respondent's personal judgment is an important aspect of how accurate a response on an item can be. This issue may also account for the suggestions in the data that the relationship between the single-item and the comparison measure is important, with the imperative that the same elements should be represented in each. With only a simple single-item to create this representation, the prior knowledge of the respondent may be a key factor in the

results but this understanding may also be based on the design of the item, where a single-item referring to a tangential aspect of the construct of concern (e.g. "Do you feel under pressure" for stress) is handicapped in that the more accurate the response is to the item, the less likely it is to correlate with an accurate response to a non-identically worded measure. The ability for respondents to use an overall judgment of the construct has been highlighted as an advantage of single-items (Scarpello & Campbell, 1983), however the results of the review may also indicate that an extra consideration should be made for how the respondent creates this judgment in single-item measure design in order to produce valid responses.

In the majority of the cases in the review a specific definition of the construct is not provided and this may limit the single-item approach to only those factors that are well understood or common to the respondent. It may therefore be useful for the researcher to indicate to the respondent the elements that they should be considering in their judgment in order for the single-item measure to represent the intended construct accurately and these guidelines should be closely related to the measure the single-item is intended to replace. This issue is not a dilemma specific to single-item measures, however, and is rather a consideration of content validity, as when designing a measure of any length or purpose.

3.4 Summary

With the design of the specific measure in mind, single-item measures appear to provide largely comparable scores to multi-item measures and can be useful tools for assessing well-being in a multi-faceted way. However the review also highlights a lack of evidence for many variables, for example work characteristics and coping style, and it is therefore not known whether some variables may be inherently difficult to measure using a single-item, due to difficulty in representing the correct elements of a complex construct in such a small space. Furthermore, the review also only represents a proportion of the validity of responses on single-item measures and does not provide evidence for how well they may perform in practice in other ways, for example in predicting well-being outcomes such as life satisfaction or mood. Single-item measures of each of the relevant variables therefore need to be examined before complete confidence can be given to the validity of single-item responses to each dimension of well-being in the current model and more comprehensive analysis of the utility of these responses, for example in predicting well-being, should be performed. Wanous, et al (Wanous, Reichers, & Hudy, 1997) encourage the examination of single-item measures in terms of validity and reliability and suggest their use is a question of appropriateness for purpose. This review provides a basis for further study in the context of practical well-being assessment by indicating the potential for single-item measures to represent the relevant constructs accurately in comparison to traditional multi-item measures.

Chapter 4: Development and validation of single-item measures

4.1 Background

Chapter 1 established that a multi-dimensional approach to assessing well-being outcomes, alongside factors that may lead to these outcomes, was appropriate for well-being management in theory but that this level of complexity creates practicality issues in applied settings. A single-item measure approach was proposed as a potential alternative to reduce these practicality issues while maintaining the recommended multiple dimensions and the results of Chapter 3 supported this proposal. The present chapter furthers this line of research by testing directly the validity and reliability of single-item measures designed for practical well-being assessment in the framework of the DRIVE model proposed in Chapter 2.

4.1.1 Rationale
The purpose of the project was to develop single-item measures of well-being and, as with any new measure, an important element of this development is to establish the validity and reliability of the items (Nunnally, 1978). Although Chapter 3 presented the findings of previous research that had demonstrated valid results from single-item measures in the past, the variability across measures and the lack of evidence for some variables associated with well-being support the further research into the psychometric properties of single-item measures of well-being constructs.

With Chapter 3 providing an indication that single-item measures can be suitable for assessing at least some well-being associated factors, the next stage of the research was therefore to determine more directly whether this can be applied to the current context of practical well-being assessment. The current chapter therefore is intended to assess the use of a single-item approach to create a practical well-being tool, with the simple DRIVE model providing a theoretical framework of well-being and single-item measures providing a practical method of measurement within the framework.

4.2 Development of single-item measures of well-being and associated variables

Items were created for variables associated with well-being in terms of the model described in Chapter 2. The model assumes direct relationships between work demands, work resources, individual differences, personality, and outcomes. A number of items were created in order to explore a range of variables for each variable group, as past research has demonstrated that multiple associated variables can contribute uniquely to well-being outcomes and that these contributions may vary depending on the specific well-being outcome involved (see Chapter 2). At the same time, as suggested by Smith et al (Smith, et al., 2009), it is not possible to measure every possibly important variable and therefore the variables were chosen in order to assess single-item measures of a broad range of variables associated with well-being while also balancing this with a realistic selection of the vast number of variables and measures developed over the years. The variables that were chosen represent those that were used in previous research using a multi-faceted approach to workplace well-being (e.g. (Mark & Smith, 2012; Mark & Smith, 2012; Smith, et al., 2004; Smith, et al., 2000), were congruent with international and national well-being definitions (Waldron, 2010;Wismar, et al., 2013), and had strong research evidence for their association with well-being (e.g. (Diener, et al., 1999;DeNeve & Cooper, 1998; Diener, et al., 2003;Tsutsumi & Kawakami, 2004; Van Der Doef & Maes, 1999) and their recommendation for well-being assessment (e.g. Rick, et al., 2001;Parkinson, 2007).

4.2.1 Previous DRIVE model variables
As the DRIVE model is used as the theoretical framework of the research, the original variables used in previous research using this framework also were used (Mark & Smith, 2012)(Mark & Smith, 2012). This involved the use of demands and effort as the work characteristics making up the demands variable group, reward, control, and support as the work characteristics making up the resources variable group, and coping style and attributional style making up the individual differences group.

4.2.2 Additional variables
Additional variables were included in order to acknowledge other factors that may fit into this framework, on the basis that these variables may add to a multi-dimensional approach and that single-item measures may enable their addition to a measure without a significant impact on survey length or response burden.

Work characteristics

As the HSE MS represents the current recommended method of measuring well-being psychosocial hazards in the workplace (Black, 2008), other variables not already accounted for by the DCS and ERI models were included. These variables were role understanding, supervisor relationship and consultation on change, which contributed to the resources group. Bullying has

been identified as an important element, particularly in nurses (Quine, 1999), and was also included as a demand. Measures of these variables were combined with those described above to represent context-relevant circumstances.

Personality

While individual differences have been accounted for previously in the DRIVE model by including coping style and attributional style variables, personality variables represent a significant omission in this area, particularly when considering subjective well-being outcomes where personality has been cited as potentially the most important predictor (Diener, et al., 2003). The most commonly used model of personality is the five factor, or big 5, model (Steel, et al., 2008) and extraversion and neuroticism in particular have demonstrated significant relationships with positive and negative well-being outcomes, although specific associations with other big 5 variables have also been demonstrated (Hayes & Joseph, 2003). Extraversion, emotional stability, conscientiousness, agreeableness, and openness were therefore included.

While these broad personality characteristics are the most frequently measured, it has also been stated that this may be an oversimplification of the associations between personality and well-being (Diener, et al., 2003) and may lead to a loss of predictive variance from more specific personality variables (Schimmack, et al., 2004). Other frequently cited variables associated with personality and well-being are optimism, self-esteem, and self-efficacy:

Optimism has been associated with a range of well-being outcomes, including life satisfaction and happiness (Sharpe, Martin, & Roth, 2011;Scheier, Carver, & Bridges, 1994;Kluemper, Little, & DeGroot, 2009) and Bandura (1988) suggests that perceived self-inefficacy is the major source of anxiety and cause of avoidant behaviour. Self-esteem is considered to be an important variable in depression, negative affect, and stress (Lee-Flynn, et al., 2011). Each have also been suggested as potential buffers against negative well-being outcomes (Lee-Flynn, et al., 2011)(Chang, et al., 2011; Maciejewski, Prigerson, & Mazure, 2000) and have been implicated in research on the well-being of teachers (Ralf Schwarzer & Hallum, 2008) and nurses (Chang, et al., 2011). Measures of optimism, self-efficacy, and self-esteem have also been supported in reviews of well-being measures (Parkinson, 2007). In their review of personality variables and their associations with well-being, Deneve and Cooper (1998) conclude that the most important personality variables appear to be those that are concerned with making healthy attributions. Although not specifically mentioned in their review, self-esteem, optimism, and self-efficacy can theoretically be said to represent positive attributions related to one's self, one's future, and one's abilities respectively. Optimism, self-esteem, and self-efficacy measures were therefore also included.

4.2.3 Outcomes

Outcomes were included primarily to acknowledge the well-being variables implicated in policy (Knapp, et al., 2006; McDaid; Waldron, 2010; Wismar, et al., 2013) and previous well-being research (e.g. Smith, et al., 2004;Mark & Smith, 2012; Smith, et al., 2009).

Stress, depression, and anxiety were included as the nationally monitored negative psychological well-being outcomes (e.g. in the Labour Force Survey) and frequently assessed well-being outcomes in the workplace (e.g.Smith, et al., 2009)).

In order to acknowledge SWB, positive mood, negative mood, and life satisfaction were also included. As stated in Chapter 2, SWB has been demonstrated as distinct from mental health outcomes such as depression and anxiety (Headey & Wearing, 1989; Keyes, 2006) and may be useful in itself as an outcome for those who may not recognise depression in themselves or may not want to report it (Gargiulo & Stokes, 2009). Furthermore, the subjective element of well-being and satisfaction judgements have been suggested as integral parts of well-being as a whole (Diener, et al., 1998; Waldron, 2010). In previous applications of the DRIVE model and other work well-being research (Smith, et al., 2009), satisfaction overall and with specific domains was referred to as appraisals. In the present research these elements are referred to as cognitive well-being in line with SWB theory (Diener, 1984).

4.2.4 Potential for redundancy

As acknowledged in Chapter 2, while the inclusion of further variables may increase predictive validity and account for the multi-dimensional nature of well-being, there is also the potential for increased redundancy. While these variables have each been associated with well-being, there is also discussion as to whether they each form independent relationships or simply act through associations with other important variables. Optimism, for example, may have associations with well-being through its impact on coping or explanatory style, with optimists more likely to use problem focused coping than emotional coping methods and more likely have internal attributions for positive events (Kluemper, et al., 2009;Scheier, et al., 1994). Self-esteem may also be linked to optimism as a positive expectation regarding one's self worth (Scheier, et al., 1994) and each of these elements have also been suggested to be potentially just elements of broader personality constructs such as extraversion and neuroticism (Sharpe, et al., 2011)(Scheier, et al., 1994) and therefore including both may be unnecessary.

However it is also suggested that such variables contain a significant amount of unique variance and are worth exploring separately (Scheier, et al., 1994) as it is not fully established whether such factors have unique associations beyond those accounted for by, for example, broad personality characteristics (Diener, et al., 2003) or whether some measures may simply be assessing the same predictive variance in outcomes (Judge, Erez, Bono, & Thoresen, 2002).

Similarly, outcome variables such as satisfaction with life, depression, negative affect and anxiety have shown correlations between .31 and .72 in various reports but have also been concluded to have some degree of unique variance (Larsen, Diener, & Emmons, 1985; Pavot & Diener, 1993) and, as discussed in Chapter 3, their independent associations are an integral part of well-being conceptualisations.

While there is some potential for redundancy in the items therefore, the evidence regarding which variables are and are not relevant for well-being assessment is not conclusive. Single-item measures were created to assess this range of variables as part of an approach that was designed to assess the potential limitations of single-item measures in terms of the types of variables they may be suitable for and to provide more direct evidence of potential redundancy in this context by including variables together. Further details including the design of the items are described in the relevant materials section.

4.3 Assessment of validity and reliability

Using multi-item questionnaires to represent the current approach to well-being assessment, the single-item measures were assessed for validity and reliability in comparison to established multi-item measures of the same constructs, using methods appropriate to the variables involved:

4.3.1 Validity
The validity of a measure is assessed in relation to its intended purpose (Cronbach, 1990; Nunnally, 1978). Content and construct validity, which are concerned with how well the measure represents the variable for which it is designed, are of primary importance for outcome measures because the purpose of these measures is to accurately represent the variable in question (Nunnally, 1978). Predictive validity is more important for predictor variables (Cronbach, 1990; Nunnally, 1978), as their purpose is to predict scores on a particular outcome.

While predictive validity will be examined in the following chapter, the current chapter focuses on the validity of the items in terms of how well they represent the desired constructs. The reason for assessing this first is that finding similar predictive relationships with outcomes using the single-item measures as with using the multi-item measures will be somewhat dependent on them representing the same constructs. Also, from a practical application perspective it is important that the results found in practice identify the correct issue and target for intervention.

Content validity

The first stage of assessment for the newly designed measures is therefore to assess how well they measure the variable for which they are intended. The content validity of measures should

be ensured in the construction of the measure itself (Nunnally, 1978). In previous research this has been achieved by sampling items from a pool of already available items (Thompson, 2007). In the present research a similar approach was followed by sampling questions from the multi-item measures into the examples provided alongside the single-item measures. This is explained further in the method section but the primary goal of this was to ensure the content of the items was valid.

Construct validity

Measures of abstract variables require construct validity, which is concerned with how well the results represent the behaviour of a person with the construct in question (Cronbach, 1990), therefore providing a proxy measure of a variable that cannot be measured directly. One approach to this type of validation in a newly-designed measure is to compare it to an established measure of the same variable, referred to as concurrent validity when the measures are completed at the same time (Cronbach, 1990). This study therefore compares the single-item measures to established multi-item measures already in use, in order to establish their construct or concurrent validity.

Although, from a statistical standpoint, correlations of .80 are used to consider two sets of scores as unidimensional (Tabachnick & Fidell, 2007), correlations between two measures designed to assess the same construct are frequently lower due to attenuation (Nunnally, 1978). Costa & McCrae (1980) for example found correlations of .65 for two extraversion measures and .68 for two neuroticism measures (Sixteen personality factor questionnaire and Eysenck personality inventory). Sheldon, Ryan, Rawsthorne, & Ilardi (1997) assessed the validity of an adjective-ratings based measure of personality against the NEO measured 2 weeks later. Correlations of .64 or above were found for extraversion, neuroticism, and conscientiousness and.48 and .43 for agreeableness and openness. A revised set in a second study increased these values to .52 (openness) and .75 (conscientiousness) and these results were considered acceptable validity alongside weaker correlations between incongruent variables (Sheldon, et al., 1997). This research suggests that moderate correlations are often found between accepted multi-item measures of the same construct and these standards can also be applied to single-item measures, with results in Chapter 3 showing relationships of similar strength between single- and multi-item measures.

Discriminant validity

Construct (or concurrent) validity should also however be considered alongside discriminant validity, as demonstrated in Sheldon et al's (1997) interpretation of correlations between measures of the same variables alongside those of different variables as described above. Discriminant validity establishes how well the measure distinguishes between its intended

construct and those that may be correlated but are theoretically distinct. Discriminant validity is also measured using correlation analysis, with low correlations being desirable. Van Saane et al (Van Saane, Sluiter, Verbeek, & Frings-Dresen, 2003) suggest that the criterion for acceptable concurrent validity is a correlation of .50 or higher, while a correlation of .50 or less can be considered as adequate discriminant validity.A cutoff of .50 is a crude approach to determining concurrent validity, as a strict application would lead to a measure correlating .49 considered to have poor validity while a measure of .50 correlation would be acceptable, however, this is only used as a general guide. In reality it is the disparity between validity and discriminant validity that is important, and as such, although a cut off of .50 has been used in the past (Van Saane et al), concurrent and discriminant validity of the items will be examined in comparison to each other to determine how well the single-item measures perform. As well as using the correlation between the single-item measures and multi-item measure of the same construct to determine construct validity, discriminant validity was therefore also determined in this study by correlating the single-item measure and multi-item measure of associated constructs. For example, the single-item job demands measure was correlated with the multi-item job demands measure as well as the multi-item measures of effort, reward, etc. The combination of comparisons therefore provides a comprehensive indicator of the validity of the single-item measures.

Diagnostic validity

An associated element of validity that is used specifically in outcome measures is diagnostic validity. This refers to the ability for the measure to correctly identify a respondent that meets a diagnostic criteria, for example clinical levels of depression or anxiety. This method involves comparison with an established measure in terms of the proportion of those with the condition correctly identified as such (sensitivity) and the proportion without the condition correctly identified as such (specificity). This is most common in depression and anxiety research where specific criteria exist for diagnosis of clinical depression or anxiety (see Chapter 3 for examples). This is relevant to our practical measures in that the newly designed measures should identify those with high or low well-being accurately so that, when the measures are applied in practice, intervention is targeted at the right people.

In the present study, the single-item depression and anxiety measures were compared against the HADS measures, which contain cut-off scores for cases of depression or anxiety and a 'normal range'. While the remaining outcome measures do not have clinical cut-off points, the sensitivity/specificity approach is also applied to these measures by comparing groups created using median splits, on the basis that, in applied settings, a median split may be used to identify those who are most at risk or most suitable for intervention. The analysis will therefore indicate how accurately respondents could be categorised into high and low groups using scores on a single-item measure, compared to the groups created using the multi-item measure they are intended to replace.

4.3.2 Reliability

Reliability is possibly the most commonly criticized, yet infrequently assessed, aspect of single-item measures (Viswanathan, et al., 1996). This is most likely due to an assumed inability to estimate the internal consistency of a single-item, although multiple approaches do exist. One approach is based on the correlations between scores taken at 3 points in time Heise (1969, Equation 9), however the most direct approach is using the Wanous (Wanous, et al., 1997) method, using the correction for attenuation formula. Using this formula, Wanous et al (1997) estimated the minimum reliability of a single-item job satisfaction question as .70 based on a meta analysis of 17 studies.

The present study therefore also includes estimates of the reliability of the single-item measures using the Wanous et al(1997) method, in order to determine whether the positive finding in Wanous et al (1997) is applicable to other variables. The method is described in section 4.4.5 'Analysis procedure'.

It has been argued that the reliability of a measure is secondary to validity and that a lack of reliability should not preclude the use of a valid measure (Nunnally, 1978). Despite this, reliability is used as an important aspect of the judgment of measures (Wanous & Hudy, 2001) and this study provides an opportunity to establish a quantitative value for the loss of reliability frequently cited for single-item measures.

4.3.3 Sample

This research involves university staff and local nurse groups as nurses and education professionals represent 2 out of 3 of the occupations with the highest estimated prevalence of work-related stress in the UK (HSE, 2013). Previous work on the DRIVE model also used samples of university staff and nurses (Mark & Smith,2012; Mark & Smith, 2012) and therefore the application of this approach in this sample is already established, providing a suitable foundation for further research.

4.3.4 Summary

The current chapter presents results of two exploratory studies to establish the validity and estimated reliability of single-item measures of well-being and associated factors, in terms of demands, rewards, individual differences, personality, and outcomes. Single-item measures were created for these variables and compared to established multi-item measures of the same

constructs, providing an examination of the extent to which potential limitations of the single-item approach affect their suitability as practical measures.

4.4 Method Study 1

4.4.1 Participants
One hundred and twenty university staff members aged 20-64 participated in the study as part of a larger survey on well-being. This number of participants was considered satisfactory to identify the large effect sizes predicted for correlations between single- and multi-item measures of the same constructs, based on previous research, and to provide a meaningful cases-to-IV ratio for multiple regression analysis (Tabachnick & Fidell, 2007). Participants from all areas of the university were able to participate, including finance, teaching, accommodation, and security, although the role of specific respondents was not recorded. The majority were aged 30-39 (32%), married or living with a partner (63%), earned between £10,000-£19,999 per year (33%) and were educated to degree or higher degree level (73%). Working patterns were most commonly full-time (81%) fixed hours (79%), and no more than 18% worked either long, unsociable, or unpredictable hours, or were exposed to either noise, fumes, or harmful materials.

4.4.2 Materials
A questionnaire consisting of single-item measures, developed in-house, and established multi-item scales of the same measures. The variables measured and the associated multi-item scale are provided in Table 4.1 below; a copy of the questionnaire is provided in Appendix 4.3. Multi-item comparisons were chosen based on their previous use in research and/or their recommendation in papers regarding well-being measurement (Parkinson, 2007; Rick, et al., 2001). Where possible, the brief versions of measures were used to provide a fair representation of the number of items required in practical well-being assessment.

Table 4.1: Comparison between the single- and multi-item approach in the number of items used for each measure

Variable	Number of Items		Multi-Item Measure
	Multi	Single	
Work Characteristics			
Demands, Control, and Support	16	3	DCSQ ((Sanne, et al., 2005))

Effort and Reward	32	2	ERI Questionnaire ((Siegrist, et al., 2004)
Supervisor relationship	7	1	LMX ((Scandura & Graen, 1984))
Understanding of role and Consultation on change	8	2	HSE MS (HSE, 2004)
Bullying	19	1	Quine (Quine, 1999)
Personality Extraversion, Emotional Stability, Conscientiousness, Agreeableness, and Openness	40	5	Mini Markers (Saucier, 1994)
Perceived self-esteem	10	1	Rosenberg Self Esteem Scale (Rosenberg, 1965)
Perceived self-efficacy	10	1	Generalized Self Efficacy Scale (R. Schwarzer & Jerusalem, 1995)
Optimism/Pessimism	10	1	Life Orientation Test Revised (Scheier, et al., 1994)
Coping Style Problem-Focused Seeks social support Avoidance Blame Self Wishful thinking	43	2	Ways of Coping Checklist Revised (Vitaliano, Russo, Carr, Maiuro, & Becker, 1985)
Attributional Style Internality, Stability, Globality of Positive and Negative Attributions	36	6	Attributional Style Questionnaire Smith, 2000 #1978}
Outcome Measures Depression	7	1	Hospital Anxiety and Depression Scale (Zigmond & Snaith, 1983)
Anxiety	7	1	
Positive Affect and Negative Affect	10	2	Positive Affect and Negative Affect Schedule International Short Form (Thompson, 2007)
Life Satisfaction	5	1	Satisfaction With Life Scale (Diener, et al.,

			1985)
Stress	10	1	Perceived Stress Scale 10 (S Cohen, et al., 1988)
Total	270	31	

Single-item measure development

The newly developed single-item measures were designed based on the conclusions from Chapter 3 and guidance on single-item measure development in the literature regarding unidimensionality and clarity for the respondent (Sackett & Larson, 1990).

Based on the conclusion in Chapter 3 that the validity of a single-item measure may depend on how accurately the respondent understands the targeted construct, single-item measures included an initial statement or question and were followed by examples of what the item was referring to. An example in the case of optimism is given below. These examples within the item were statements taken from the multi-item measure in order to provide guidance on what the statement was referring to and maintain congruence between the single and multi-item responses. The examples were chosen in order to provide a good representation of the items in the multi-item measure rather than including multiple items that appeared very closely related (such as "I can always manage to solve difficult problems if I try hard enough" and "I can solve most problems if I invest the necessary effort").

In general, I feel optimistic about the future (For example: I usually expect the best, I expect more good things to happen to me than bad, It's easy for me to relax)

Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly

Items that were structured in the form of an initial statement each had the response scale from "Disagree strongly" to "Agree strongly" while those with an initial question (e.g. "On a scale of one to ten, how depressed would you say you are in general?") each had the response scale from "Not at all" to "Extremely". All items had a response scale from 1-10, chosen for practical and statistical reasons. In terms of practicality, a consistent simple 1-10 scale is in line with the intended purpose of the items for a practical well-being measure. In statistical terms, a 1-10 scale allows a greater range of potential responses than shorter likert scales, which was deemed

appropriate for a single-item intended to represent an entire construct. Although there is no consensus on the optimum number of response alternatives, reliability has been shown to increase with the number of alternatives and it has been suggested that this benefit is most applicable to those concerned with the reliability of short items (Maydeu-Olivares, Kramp, García-Forero, Gallardo-Pujol, & Coffman, 2009). From this and previous applications of single-item measures included in Chapter 3, the 1-10 visual analogue response scale was therefore chosen over likert scales or yes/no responses.

In the case of stress, the single-item "In general, how stressful do you find your job?" with a 1-5 response scale from "not at all stressful" to "extremely stressful" had been used in extensive previous research on stress in the workplace (Smith, et al., 2009). This provided an opportunity to examine any potential benefit of the design choices made above by providing a single-item measure that did not follow these design choices in terms of inclusion of examples and 1-10 response scale, while still providing a valid single-item indicator of stress based on previous research.

In total, single-item measures consisted of 31 items measuring the same variables as multi-item measures achieved with 270 items. Measures were created to include individual items for each variable while trying to avoid creating an excessive number of items. For example, while reward may include esteem reward and financial reward as sub-factors, a single-item was instead used for reward as a whole. Previous research has shown that while individual elements of reward have been used it can be difficult to distinguish between them (Tsutsumi & Kawakami, 2004) and therefore reward, as part of the effort-reward imbalance model, was measured with a single-item. Similarly, the application of coping style refers to positive coping methods (i.e. pro-active coping) and negative coping methods (i.e. emotion-focused coping) and therefore a single item was created for positive coping and a single-item for negative coping, rather than an item for each potential type of coping method. This approach to creating single-item measures for each facet of a multi-faceted construct has been recommended previously and used in factors such as personality (Hoeppner, et al., 2011). The following page shows the complete set of single-item questions.

Work characteristics

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

(Reward) I feel that I have been rewarded for my efforts (for example: The respect, role, and job prospects I receive are suitable for my efforts and achievements)

(Demands) I feel that my work is too demanding (for example: I have to work very fast, I have to work very hard, I have conflicting demands)

(Control) I feel that I get adequate control over my work (for example: I have a choice in what I do or how I do things, I am able to learn new things, I am able to be creative)

(Support) I feel that I am supported by my colleagues (for example there is a good atmosphere at work, I get along with my colleagues, my colleagues understand me)

(Bullying) I feel that I have been subjected to bullying in the workplace in the past 12 months (for example: unjustified criticism, verbal/non-verbal threats, violence, humiliation or exclusion)

(Change) I feel that I am not consulted about changes at work (for example: There is no opportunity to question managers about change, I am unclear about how change will work out in practice).

(Role) I feel that I don't understand my role clearly (For example: I am not clear of what is expected of me and what tasks I need to perform)

(Supervisor relationship) I feel that I get along well with my supervisor (For example: I know where I stand in terms of their opinion of me, my supervisor understands me, my supervisor recognises my potential)

Individual differences

(Positive Coping) When I find myself in stressful situations I try to deal with it in a pro-active way (For example: by taking one step at a time, by changing something so that it would work out, by learning from the situation, by asking someone for help)

(Negative Coping) When I find myself in stressful situations I tend to look inwardly (For example: I blame myself for the situation, wish that I had the power to change what has happened, wish the situation would go away, try to forget the whole thing)

(Positive attributions) The following section refers to positive experiences. In considering your responses, please try to imagine yourself experiencing a variety of positive outcomes (for example: a pay rise at work, a successful application, or a positive encounter with a friend).

(Internal item) Do you believe that positive outcomes are more likely the result of external factors (e.g. luck, other's influence) or internal factors (e.g. effort, determination)?

(Stable item) Do you believe that factors that currently influence positive outcomes will also be important in the future?

(Global item) Do you believe that the same factors influence most positive outcomes?

(Negative attributions) Now please do the same for this section, but try to imagine yourself experiencing a variety of negative outcomes (for example: a meeting goes badly, a friend lets you down, you fail at a task).

Personality

(Optimism) In general, I feel optimistic about the future (For example: I usually expect the best, I expect more good things to happen to me than bad, It's easy for me to relax)

(Self efficacy) I am confident in my ability to solve problems that I might face in life (For example: I can usually handle whatever comes my way, If I try hard enough I can overcome difficult problems, I can stick to my aims and accomplish my goals)

(Self esteem) Overall, I feel that I have positive self-esteem (For example: On the whole I am satisfied with myself, I am able to do things as well as most other people, I feel that I am a person of worth)

(Extraversion) I consider myself to be outgoing (For example: Talkative, comfortable with myself, confident in social situations)

(Agreeableness) I feel that I have an agreeable nature (For example: I feel sympathy toward people in need, I like being kind to people, I'm co-operative)

(Conscientiousness) I feel that I am a conscientious person (For example: I am always prepared, I make plans and stick to them, I pay attention to details)

(Emotional stability) I feel that I can get on well with others (For example: I'm usually relaxed around others, I tend not to get jealous, I accept people as they are)

(Openness) I feel that I am open to new ideas (For example: I enjoy philosophical discussion, I like to be imaginative, I like to be creative)

<u>Outcomes</u>
(Positive affect) Thinking about myself and how I normally feel, in general, I mostly experience positive feelings (For example: I feel alert, inspired, determined, attentive)
(Negative affect) Thinking about myself and how I normally feel, in general, I mostly experience negative feelings (For example: I feel upset, hostile, ashamed, nervous)
(Satisfaction) Overall, I feel that I am satisfied with my life (For example: In most ways my life is close to my ideal, so far I have gotten the important things I want in life)
(Depression) On a scale of one to ten, how depressed would you say you are in general? (e.g. feeling 'down', no longer looking forward to things or enjoying things that you used to)
(Anxiety) On a scale of one to ten, how anxious would you say you are in general? (e.g. feeling tense or 'wound up', unable to relax, feelings of worry or panic)?
(Stress) In general, how stressful do you find your job?

4.4.3 Design
A cross-sectional design, where all respondents completed the same questionnaire.

4.4.4 Procedure
Participants responded to an internal advertisement on the university online notice board and those interested were sent a link to an online questionnaire which they could complete in their own time. The questionnaire was expected to take approximately one hour to complete. Participants were instructed that they could skip any questions that they were not comfortable answering, although all data were provided anonymously. Ethical approval was provided by Cardiff University Psychology Ethics Committee. Informed consent was achieved within the questionnaire where participants could not continue beyond the consent page without agreeing. Following the consent page participants were presented with an instructions sheet and following the questionnaire a debrief sheet was provided. Copies of the consent, instructions, and debrief sheets are provided in Appendix 4.1, 4.2, and 4.4. The questionnaire itself began with demographics, followed by job characteristics: the developed short items and the established full scales. A full copy of the questionnaire is presented in Appendix 4.3. All data were collected electronically using SurveyTracker software and scored and analysed using SPSS 18 and Microsoft Excel.

4.4.5 Analysis Procedure
Guidance from Tabachnick and Fidell (Tabachnick & Fidell, 2007) was followed regarding data preparation, with the data assessed for outliers, missing values, and normality.

Outliers can affect the data by impacting on the distribution of variables and also therefore means, standard deviations, and the analysis of relationships with other variables. Outliers were assessed by calculating z-scores for each of the variables and using a cut-off of 3.29 as identification of a potential outlier (Tabachnick & Fidell, 2007). Missing data were assessed in order to determine the degree and impact of missing data. The amount of missing data was assessed for each variable, with a cut-off of 10% missing data used for further investigation. Multiple imputation was chosen as the desired method for dealing with missing data. Multiple imputation is the most highly recommended approach (Tabachnick & Fidell, 2007) and involves

estimation of the missing values based on a number of regressions with associated variables using random values generated from the distribution of the missing variable. The average value estimates from the regressions are then used to replace missing data. Skewness and kurtosis can affect analyses involving correlation and multiple-regression due to a lack of normality in the distribution leading to spurious relationships (Tabachnick & Fidell, 2007). Skewness and kurtosis were assessed using 1.0 as the cut-off and those variables meeting this criteria were transformed using the appropriate method (Tabachnick & Fidell, 2007) and re-assessed.

Construct and discriminant validity of the single-item measures was assessed using Pearson product moment correlation. Although significance is reported, the size of the correlation is used to judge the validity of the measure due to the exploratory nature of the study and the risk of type I error in so many comparisons. A correlation of .50 has been previously reported as a cut-off for concurrent and discriminant validity (Van Saane, et al., 2003). To prevent confusion when referring to construct and discriminant analyses, which both involve concurrent correlations, the term 'same-variable' is used for correlations between the single-item and multi-item measures of the same construct (representing construct validity) in contrast to the correlation between the single-item measure of one variable and the multi-item measure of another variable, which represents discriminant validity.

The diagnostic validity of the outcome measures was examined by creating groups based on the distribution of scores on outcome measures using the single- and multi-item scales. Sensitivity and specificity were examined for depression and anxiety where the multi-item scale includes known cut-offs for cases of clinical depression or anxiety. Low and high scores based on the possible range on the single items for depression and anxiety were compared with established cut-offs for 'no depression/anxiety' and 'mild' to 'severe' depression/anxiety. For the other outcome measures, there are no such cut-offs for clinical or non-clinical scores that can be compared to the single-item measures. Scores were therefore divided based on the median for each scale, as creating splits based on the possible range of scores would not be comparable across measures due to different methods of scoring and the influence of differences in the distribution due to skewness. Comparing the high/low groups using a median split is also a possible approach in practice and therefore would still provide an indicator of the congruence between these groups if single-item, rather than multi-item, measures were used in occupational settings. For the single-item scores, the sensitivity and specificity is reported for each potential cut-off score for high/low groups including the median, to explore the potential sensitivity and specificity of the item depending on what is considered a high or low score.

Reliability estimates were calculated using the Wanous et al(1997) adjustment of the correction for attenuation formula, with a value of .90 as the assumed true correlation between the measures. The correction for attenuation formula is used to estimate the correlation between two variables if the two variables had perfect reliability. In correction for attenuation, the 'true' correlation is calculated using the internal consistency reliabilities of the two measures and the correlation found between them. Wanous et al (1997) have shown that if we assume the true

correlation between a single- and multi-item measure of the same construct is .90 (a conservatively low estimate) and we know the reliability of the multi-item scale and the observed correlation between the two measures, we can use the correction for attenuation formula to estimate what the minimum reliability of the single-item measure must be for the observed correlation to occur.

The below equation demonstrates the correction for attenuation formula as it is used to provide a 'true' correlation between two scores for measures of the same variable:

$$rxy = \sqrt{(rxx * ryy)}$$

Where rxy is the true correlation between the scores on measure x and measure y, rxx is the reliability of measure x, and ryy is the reliability of measure y.

This formula can be reworked to find the reliability of measure x if the correlation between the scores on the variables (i.e rxy) is assumed. The equation therefore becomes:

$$rxx = \frac{rxy^2}{ryy}$$

Therefore having ryy as the reliability of the multi-item measure and rxy as .90 (as recommended by wanous et al as a conservative estimate of the correlation between two measures of the same variable) then the equation produces a value for rxx that represents the estimated minimum reliability of the single-item measure.

4.5 Results Study 1

4.5.1 Data preparation

Outliers were found in twovariables. In avoidance coping style, an outlier was identified with a score of 23, compared to a mean score of 7. In depression an outlier was identified with a score of 17, compared to a mean of 4.3. Distributions on these variables were examined for normality and the outlier scores did not appear to be having a noticeable effect on any variable. Furthermore, the scores were not outside a logical range, and rather represented the lack of cases at extreme ends of the relevant scales. Therefore outliers were considered to be relevant to the data and not removed.

Missing values

The full-scale effort and reward scores each had greater than 10% missing data.

For the effort and reward variables, imputations were made using the remaining work characteristics variables as predictors, both for logical reasons and because they are each correlated with one or the other effort-reward variables. Using this method, 21 missing values were replaced for the effort variable and 27 for the reward variable leaving no missing data. Mean and standard deviation for effort was 9.35 and 3.63 before imputation and 9.30 and 3.79 after imputation. For reward mean and standard deviation were 44.97 and 8.47 before imputation and 44.47 and 8.83 after imputation.

Normality

Those variables with skewness or kurtosis greater than 1.0 were transformed as follows, reducing values below the 1.0 cut-off:

A square root transformation provided more satisfactory results for negative affect (single-item), depression, role understanding (single-item), openness (single-item), self-efficacy, stable positive attributions (single-item) anxiety (single-item), and effort (single-item). A logarithmic transformation provided more satisfactory results for bullying (single-item and multi-item). Global positive attributions did not benefit from any transformation and was not transformed.

Transformed variables were used in correlation and multiple-regression analyses.

4.5.2 Descriptive Statistics of multi-item and single-item scores

Comparing across variables, the sample had generally lower scores on demands and effort and higher scores on control and support. The results indicate high efficacy, agreeableness and conscientiousness and more positive coping methods than negative coping. In terms of well-being outcomes, the sample showed low negative mood, depression, and stress.

Table 4.2: Descriptive statistics for each variable using the single- and multi-item measures.

Variable	N (multi)	N (single)	Minimum (multi)	Maximum (multi)	Minimum (single)	Maximum (single)	Mean (multi)	Mean (single)	Standard Deviation (multi)	Standard Deviation (single)
Demands	118	118	6	20	1	10	13.2	4.1	2.75	2.31
Control	114	120	6	19	2	10	13.9	6.7	2.56	2.05
Support	111	119	6	24	1	10	18.4	6.8	3.77	2.24
Effort	99	120	5	21	1	10	9.4	5.0	3.63	2.46
Reward	93	120	11	55	1	10	45.0	5.9	8.47	2.39
Role	118	120	10	25	1	10	19.7	3.5	3.45	2.61
Change	118	116	3	15	1	10	9.3	5.0	2.59	2.50
Supervisor Relationship	114	119	7	28	1	10	19.5	7.1	5.39	2.59
Bullying	113	119	23	38	1	10	35.6	2.8	3.62	2.73
Optimism	116	120	3	36	1	10	23.8	6.5	6.41	2.26
Self Efficacy	112	117	14	39	3	10	30.9	7.5	4.17	1.74
Self Esteem	115	120	5	30	2	10	19.7	6.9	5.54	2.24
Extraversion	115	120	17	70	1	10	43.8	6.3	11.74	2.26
Agreeableness	115	120	33	72	4	10	58.0	8.2	7.77	1.23
Conscientiousness	113	120	34	70	2	10	56.5	8.1	8.22	1.63
Emotional Stability	113	120	18	71	1	10	44.5	7.4	12.43	1.81
Openness	114	120	22	72	1	10	51.4	7.7	9.75	1.94
Positive Coping		119			3	10		7.5		1.80
Negative Coping		120			1	9		4.4		2.28
Problem-Focussed	113		8	36			22.1		5.80	
Seeks Social Support	115		3	17			8.5		2.78	
Blame Self	115		0	9			2.9		2.18	
Wishful Thinking	114		0	24			9.3		5.71	
Avoidance	117		0	23			7.8		4.42	
Positive Internal	117	120	12	42	2	10	28.9	6.5	5.66	1.77
Positive Stable	113	120	22	42	3	10	32.1	7.5	4.60	1.26

Positive Global	113	120	6	42	2	10	27.8	6.7	5.90	1.70
Negative Internal	116	120	11	37	1	10	21.5	5.3	5.01	2.00
Negative Stable	111	120	8	42	1	10	27.1	6.3	6.37	1.77
Negative Global	116	120	6	36	1	10	24.6	5.9	6.46	1.85
Positive Mood	118	117	8	25	2	10	17.8	6.9	3.07	1.88
Negative Mood	120	118	6	20	1	9	10.7	3.4	2.99	2.11
Depression	116	119	0	17	1	9	4.3	3.6	3.69	2.11
Anxiety	114	120	0	19	1	10	8.1	5.2	4.34	2.33
Life Satisfaction	120	120	7	35	1	10	22.0	6.4	6.65	2.16
Stress	110	120	0	33	1	5	17.3	2.4	6.47	0.87

4.5.3 Concurrent and discriminant validity

The average same-variable correlations for each variable group were .66 (work characteristics), .63 (personality), .37 (coping style), .18 (attributional style) and .63 (outcomes), suggesting good concurrent validity (above .50) in all but attributional style and coping style. In contrast, the average effect size for correlations across individual variables within groups (ignoring direction) was .32 (work characteristics), .26 (personality), .23 (coping style), .10 (attributional style), and .49 (outcomes), representing good discriminant validity (below .50) in the majority of cases, with outcome measures discriminating less well than other variable groups.

4.5.4 Work Characteristics

The average same-variable correlation for work characteristics was .66, ranging from .45 (control) to .84 (supervisor relationship). Average correlation across variables was .32, ranging in effect size from -.01 (demands-control) to .65 (support-role).

Table 4.3: Correlations between single-item measures of work characteristics variables (rows) and multi-item measures of work characteristics (columns). Bold values represent the highest correlation for that single-item measure.

	Demands	Control	Support	Effort	Reward	Supervisor Relationship	Bullying	Role	Change
Demands	**.67**[***]	-.01	-.19[*]	.50[***]	-.21[*]	-.21[*]	.23[*]	-.20[*]	-.24[*]
Control	-.08	.45[***]	**.53**[***]	-.16	.41[***]	.41[***]	-.30[**]	.58[***]	.49[***]
Support	-.27[**]	.25[**]	**.79**[***]	-.33[***]	.56[***]	.60[***]	-.53[***]	.65[***]	.56[***]
Effort	**.58**[***]	.04	-.13	.56[***]	-.18[*]	-.22[*]	.27[**]	-.23[*]	-.25[**]
Reward	-.11	.45[***]	.54[***]	-.13	**.64**[***]	.51[***]	-.49[***]	.46[***]	.57[***]
Supervisor relationship	-.22[*]	.20[*]	.53[***]	-.24[**]	.54[***]	**.84**[***]	-.51[***]	.53[***]	.58[***]
Bullying	.19[*]	-.18	-.48[***]	.24[**]	-.53[***]	-.53	**.71**[***]	-.40[***]	-.42[***]
Role	-.33[***]	.15	.45[***]	-.31[**]	.43[***]	.41[***]	-.44[***]	**.63**[***]	.49[***]
Change	-.29[**]	.17	.42[***]	-.33[***]	.64[***]	.41[***]	-.41[***]	.49[***]	**.64**[***]
N	118	114	111	120	120	115	113	118	118

4.5.5 Personality

The average same-variable correlation for personality was .63, ranging from .47 (agreeableness) to .80 (extraversion). The average correlation across measures of different variables was .23, ranging from .05 (extraversion-openness) to .64 (self-esteem-optimism).

Table 4.4: Correlations between single-item measures of personality variables (rows) and multi-item measures of personality variables (columns). Bold values represent the highest correlation for that single-item measure.

	Extraversion	Conscientiousness	Agreeableness	Emotional Stability	Openness	Self Esteem	Self Efficacy	Optimism
Extraversion	**.80*****	.14	.17	.28**	.05	.41***	.25**	.35***
Conscientiousness	.13	**.51*****	.13	.06	-.07	.17	.14	.13
Agreeableness	.06	.16	**.47*****	.17	.17	.11	.14	.11
Emotional Stability	.35***	.03	.25**	**.52*****	.02	.29**	.28**	.35***
Openness	.26**	.09	.16	.11	**.67*****	.21*	.46***	.16
Self Esteem	.50***	.32***	.20*	.51***	.26**	**.76*****	.50***	.64***
Self Efficacy	.25**	.28**	.12	.36***	.27**	.49***	.57***	**.61*****
Optimism	.33***	.29**	.19*	.50***	.18	.64***	.42***	**.75*****
N	115	113	115	113	114	115	112	116

4.5.6 Coping Style

The average same-variable correlation for coping style was .37, ranging from .32 (positive coping) to .42 (negative coping). The average correlation for measures of different variables was .23, ranging in effect size from -.10 (negative coping-seeks social support) to -.36 (positive coping-wishful thinking).

Table 4.5: Correlations between single-item measures of coping style variables (rows) and multi-item measures of coping style variables (columns). Bold values represent the highest correlation for that single-item measure.

	Positive Coping	Negative Coping	Problem Focused	Seeks Social Support	Blame Self	Wishful Thinking	Avoidance
Positive Coping	.32**	-.35**	**.40*****	-.03	-.31**	-.36***	-.27**
Negative Coping	-.10	**.42*****	-.19*	.10	.40***	.35***	.36***
	110	111	113	115	115	114	117

4.5.7 Attributional Style

The average same-variable correlation for attributional style was .18, ranging from -.03 (positive global attributions) to .35 (positive internal attributions). The average correlation for measures of different variables was .23, ranging from -.01 (positive internal-negative internal) to .21 (positive global-positive stable).

Table 4.6: Correlations between single-item measures of attributional style variables (rows) and multi-item measures of attributional style (columns). Bold values represent the highest correlation for that single-item measure.

	Positive Internal	Positive Stable	Positive Global	Negative Internal	Negative Stable	Negative Global
Positive Internal	**.35*****	.14	.04	-.01	.01	-.07
Positive Stable	.07	**.29****	.13	-.09	.12	-.04
Positive Global	.13	**.21***	-.03	-.08	.06	-.14
Negative Internal	.09	-.06	.07	.17	**-.20***	-.06
Negative Stable	.03	.11	**.17****	.08	.16	.15

Negative Global	-.07	.13	.09	.09	**.21***	.10
N	117	113	113	116	111	116

4.5.8 Outcomes

The average same-variable correlation for outcome measures was .63, ranging from .34 (life stress) to .76 (Life satisfaction). The average correlation for measures of different variables was .49, ranging from -.20 (life stress-positive mood) to .68 (depression-stress).

Table 4.7: Correlations between single-item measures of well-being outcome variables (rows) and multi-item measures of well-being outcome variables (columns).

	Depression	Anxiety	Positive Mood	Negative Mood	Life Satisfaction	Stress
Depression	.65***	.65***	-.55***	.56***	-.64***	**.68*****
Anxiety	.43***	**.68*****	-.38***	.47***	-.26**	.51***
Positive Mood	-.63***	-.56***	**.68*****	-.56***	.66***	-.62***

Negative Mood	.66***	.66***	-.59***	.64***	-.58***	**.71*****
Life Satisfaction	-.45***	-.33**	.46***	-.36***	**.76*****	-.47***
Life Stress	.30**	.29**	-.20*	.22*	-.28**	**.34*****
N	116	114	118	120	120	110

4.6 Diagnostic validity of outcome measures

A cut-off point at a score of 5 provided the best overall balance between sensitivity and specificity in the depression and anxiety items. Ideally, sensitivity and specificity would be at 100 and this cut-off provides the point where both sensitivity and specificity values are closest to 100. For example if a cut-off of 4 was used for depression then sensitivity would increase by 4.8%, however specificity would decrease by 7.4%, providing a net movement away from 100% when considering the best balance of the two values. The table however also provides cut-off points for different applications, for example in some situations the user may consider it more important to ensure that those with depression were identified at the detriment to the number of those correctly identified within the normal range. Therefore the table would suggest that a cut-off of 3 would be preferable in this case. Sensitivity at this point was 71.4% and 86.3% for depression and anxiety respectively, while specificity was 85.4% for depression and 72.6% for anxiety. For positive and negative mood compared to a median split of scores on the multi-item measure, the most suitable cut-off point corresponded to the median of scores on the single-item measure (7 for positive affect and 3 for negative affect). Sensitivity at this point was 78.5% for positive mood and 63% for negative mood, specificity 78% and 90.6% respectively. For life satisfaction, sensitivity and specificity were 91.8% and 64.4% with a cut-off point at the median (7) and for stress sensitivity was 45.9% and specificity 32.2% with a cut-off point at the median (2).

4.6.1 Depression and Anxiety

Table 4.8: Sensitivity and specificity for single-item measures compared to multi-item measures of depression and anxiety for each cut-off score on the single-item measure (bold=median score).

Depression			**Anxiety**		
Cut-off point	Normal range (1-7)	Mild-Severe (8+)	Cut-off point	Normal range (1-7)	Mild-Severe (8+)
9	-	-	9	98.4	0
8	100	4.8	8	98.4	11.8
7	95.1	19	7	98.4	35.3
6	91.5	33.3	**6**	**85.5**	**64.7**
5	85.4	71.4	5	72.6	86.3
4	78	76.2	4	62.9	90.2
3	**65.9**	**90.5**	3	48.4	98
2	43.9	90.5	2	32.3	100
1	8.5	100	1	8.1	100

4.6.2 Positive and negative mood

Table 4.9: Sensitivity and specificity for single-item measures compared to multi-item measures of positive and negative mood for each cut-off score on the single-item measure (bold=median score).

Positive Mood			**Negative Mood**		
Cut-off point	Low	High	**Cut-off point**	Low	High
9	100	8	9	-	-
8	98.5	32	8	100	7.4
7	**78.5**	**78**	7	100	16.7
6	50.8	94	6	98.4	25.9
5	38.5	98	5	98.4	31.5
4	27.7	100	4	96.9	51.9
3	12.3	100	**3**	**90.6**	**63**
2	4.6	100	2	56.2	77.8
1	-	-	1	18.8	92.6

4.6.3 Life satisfaction and stress

Table 4.10: Sensitivity and specificity for single-item measures compared to multi-item measures of life satisfaction and stress for each cut-off score on the single-item measure (bold=median score).

Life satisfaction			**Stress**		
Cut-off point	Low	High	Cut-off point	Low	High
9	100	8.5	9	-	-
8	96.7	32.2	8	-	-
7	**91.8**	**64.4**	7	-	-
6	77	84.7	6	-	-
5	52.5	94.9	5	100	1.9

4	41	98.3	4	94.6	7.4
3	24.6	98.3	3	83.9	31.5
2	9.8	100	**2**	**45.9**	**32.2**
1	1.6	100	1	23.2	90.7

4.7 Estimated Reliability

The average reliability of the multi-item measures was .81, ranging from .63 (positive internal attributions) to .94 (supervisor relationship), while the average estimated reliability of the single-item measures was .52, ranging from .00 (positive global attributions) to .94 (extraversion).

Table 4.11: Estimated reliability of the single-item measures using the Wanous (Wanous & Hudy, 2001) method compared to the alpha reliability of the multi-item measures. Items are ordered from low (right side) to high (left side).

	Single-Item	Multi-Item		Single-Item	Multi-Item
Extraversion	.94	.83	Effort	.49	.77
Supervisor Relationship	.92	.94	Self Efficacy	.45	.90
Support	.90	.86	Openness	.44	.82
Optimism	.83	.84	Conscientiousness	.40	.79
Life Satisfaction	.80	.90	Emotional Stability	.39	.86
Self Esteem	.78	.91	Control	.35	.71
Positive Mood	.73	.79	Agreeableness	.35	.80
Demands	.71	.77	Negative Coping	.24	.92
Bullying	.69	.90	Positive Internal Attrib.	.24	.63
Negative Mood	.69	.74	Positive Stable Attrib.	.16	.66
Anxiety	.66	.86	Positive Coping	.15	.83
Depression	.61	.86	Stress	.07	.90
Reward	.60	.84	Negative Internal Attrib.	.06	.59
Change	.60	.85	Negative Stable Attrib.	.04	.79
Role	.58	.85	Negative Global Attrib.	.02	.78
			Positive Global Attrib.	.00	.70

Average Single: .52 Multi: .81

4.8 Study 1 Discussion

Validity and reliability were explored for a newly developed range of well-being variables intended for a multi-dimensional well-being assessment tool. The descriptive statistics suggest that the range of potential scores is used, with the majority of variables ranging in score from 1-10. Those that have shorter ranges also have shorter ranges in the multi-item scores compared to other measures. For example, agreeableness (short score 4-10), has a counterpart minimum in the multi-item measure of 33 and mean of 58, compared to extraversion which has a minimum 17 and mean 43. Mean scores in the single-item measures also vary from 3.4 (negative mood) to 8.2 (agreeableness). The descriptive statistics therefore provide an initial indication that the single-item measures represent the valid range of scores in the respondents.

Construct and diagnostic validity were explored for all items based on the correlation between single-item measures and multi-item measures of the same construct and other constructs within the same variable group. These groups comprised of work characteristics, coping style, attributional style, personality, and outcomes.

4.9 Construct and discriminant validity

4.9.1 Work Characteristics
The work characteristics items showed generally good validity (see table 4.3), with all but two of the items having a correlation with their multi-item counterpart that was greater than .60 and support and supervisor relationship having correlations as high as .79 and .84 respectively.

The lowest correlations between single and multi-item scores of the same constructs were found for control and effort at .45 and .56 respectively. The correlations between single-item control and multi-item role understanding, and single-item effort and multi-item demands were .58, meaning that the measures with the lowest correlated single- to multi-item scores were also the only variables that correlated most strongly with a multi-item measure of another variable. Other items had similarly strong correlations with multi-item measures of other variables, for example supervisor relationship and change (.58) and support and role (.65), however the concurrent validity was much stronger for these items at .84 and .79 respectively.

What these results therefore indicate is that the single-item measures of work characteristics provide valid scores in the majority of cases, however the relationship between some closely associated constructs, such as demands and effort, may be highlighted in single-item measures of these constructs. The implication of this is that the single-item measures may not represent the

distinction between these associated constructs as well as multi-item measures. A study of the unique variance represented by these items in well-being outcomes will establish further whether these items are complimentary or the inclusion of both is redundant

4.9.2 Personality
The personality items also provided promising results for single-item use. Correlations for extraversion (.80), self-esteem (.76), and optimism (.75) demonstrated that scores on single-item personality measures can provide very high correlations with scores on multi-item measures, consistent with findings in Chapter 3.

Also consistent with findings discussed in Chapter 3, other big 5 items had lower correlations with their multi-item counterpart (e.g. agreeableness .47, see table 4.4), however these correlations were favourable compared to correlations across variables (i.e. discriminant validity), which averaged .26. The emotional stability scores showed less discriminant validity than the other measures however, correlating .35 with extraversion and .25 with agreeableness.

Self-esteem, self-efficacy, and optimism showed weaker discriminant validity overall, and although self esteem and optimism had strong correlations with their multi-item counterpart at .76 and .75 respectively, the self-efficacy measure was more strongly correlated with optimism than with itself, although this difference was small at .61 compared to .57.

The results for these variables are similar to those for work characteristics, with generally good validity and some strong correlations between single- and multi-item measures of the same constructs. However, as with work characteristics, the single-item measures may not identify unique variance in closely associated constructs such as self-efficacy and optimism and this should be studied further.

4.9.3 Coping Style
The coping single-item measures were designed to assess positive or pro-active coping style and negative or emotional coping. These were then compared to the more specific styles of problem focused and seeks social support variables (positive coping) and blame self, wishful thinking, and avoidance variables (negative coping), as well as the combined group scores of these variables. The coping measures provided less valid results than work characteristics or personality groups.

Positive coping and negative coping correlated .32 and .42 with their respective multi-item scores, representing comparatively low concurrent validity compared to the other variables examined. The convergence with the individual coping methods was similarly poor, between .35 and .40 for the single negative coping item and the individual negative coping methods and as low as -.03 for the positive coping item and 'seeks social support' (multi-item).

The negative coping style item performed better based on discriminant correlations, showing weak correlations with total positive coping score (-.10) and also with the individual scores for

problem focused coping and seeks social support (-.19 to .10). In contrast, compared to its same-variable correlation, the positive coping single-item correlated as strongly, but in the opposite direction, with the negative coping total score (-.35) and the individual negative coping methods (-.27 to -.31). This suggests that the positive coping item was as much an indicator of the absence of negative coping as it was the presence of positive coping, suggesting it would provide little contribution beyond just a negative coping item.

These results are poor in comparison to those found for work characteristics and personality and this may be due to the design of the single-item measure. While research has suggested that these individual coping styles can be considered as positive and negative methods in this way (C. S. Carver, et al., 1989) , there is also a distinction between each individual style that should potentially be acknowledged in the design of a single-item measure. Although the examples given in the single-item positive and negative measures do include examples from each individual style, a possible conclusion is that the respondents had to make a judgment which was too broad to be accurate and, in the case of positive coping, neglected social support seeking behavior entirely. The results indicate that, particularly in the case of positive coping, items for individual coping styles may be a more appropriate approach to single-item assessment of coping rather than broad positive or negative items. Comparing single- and multi-item measures of each individual style will establish further whether item design is the issue or whether the results are instead due to coping style as a construct not being suitable for single-item measurement.

4.9.4 Attributional Style
The attributional style measures performed most poorly and the results suggest that the single-item measures were not measuring this construct accurately. The strongest concurrent validity was found for positive internal attributions at .35 (see table 4.6) while many of the other subscales did not correlate at all with their multi-item counterpart, the negative subscales in particular ranging from .10 to .17 in this regard. The results also do not suggest that items are instead measuring other subscales, with these correlations also only rising as high as .17 (negative stable with positive global) across variables. Although this could be taken to indicate good discriminant validity, based on previous research on the multi-item measure of attributional style, these variables should be expected to correlate to some degree. For example, Peterson et al (Peterson & Seligman, 1987) showed a correlation of .62 between positive stability and internality, .59 between positive globality and stability, and .45 between negative globality and stability. Validity of the attributional style single-item measures was therefore poor overall in this study.

As with coping style, the design of the measure may again provide an explanation for these findings. While the attributional style single-item measure did include an individual item for each of the six factors, the result may still be due to a lack of congruence between the single- and multi-item designs. The multi-item measure includes a range of hypothetical situations with each of those situations having unique internal and external attributions for the respondent to choose from, while in an effort to reduce these examples down into one item the single-item measure

merely asks about positive or negative situations in general with a broad attribution of 'internal' or 'external'. It may therefore be the case that the respondent was not given enough information to consider the same specific situations or explanations in creating an overall score for each item, thereby reducing the likelihood that scores would correlate. As with coping style, further research designed to address this potential design issue would help to indicate whether this is indeed the case, or whether attributional style intrinsically requires a more complex measurement approach.

4.9.5 Outcomes

The outcome measures show good concurrent validity, with single-multi item correlations all greater than .60 with the exception of stress at .34 (see table 4.7).

However, the discriminant validity is not as good as other items discussed thus far, with many of the cross-variable correlations being greater than .50, representing the strongest overall correlation for the single-item measure of depression (.68 with stress) and negative mood (.71 with stress). Strong correlations across variables are however present throughout the outcome measures, for example multi-item life satisfaction and single-item depression (-.64) and therefore this may rather demonstrate the associations among different elements of well-being as a whole.

Previous research has shown that different well-being outcomes should be expected to correlate but also to have a worthwhile degree of independence (Pavot & Diener, 1993). The results using single-item measures are not beyond those found in research using multi-item measures, for example correlations in previous studies include -.32 to -.37 for life satisfaction with negative affect and .50-.51 for life satisfaction with positive affect (Diener, et al., 1985). Simsek (2011) examined the correlations of a range of variables and although some effect sizes were smaller in that study compared to the present results (e.g. -.27 for depression and positive affect in Simsek (2011) compared to -.55 in the present study) others were also comparable (e.g. .46 for anxiety and negative mood). In the current context, however, the results do highlight that, with practicality of prime importance, their independence when measured using single-items should be further established.

The outlying poor validity of the single-item stress item may be due to a poor choice of comparisons, with the multi-item measure related to stress in general (the PSS), while the single-item measure was more specific to work stress. This was the result of using a previously used single-item measure rather than creating a new measure in relation to the multi-item version, however it serves to further highlight the potential impact of item design in terms of association with the multi-item comparison discussed in Chapter 3 as the stress item used did not include examples for the respondent to consider, as the newly developed items had been designed to do. Stress items more specifically related to work stress and life stress as used in previous research (Smith, et al., 2000) may therefore provide better results and similarly domain and global satisfaction represent outcomes that have also been suggested to be associated but not equivalent (Diener, et al., 1985).

4.9.6 Summary
Overall many of the findings were promising and demonstrated the ability for single-item measures to provide valid scores on a multitude of variables associated with well-being. Coping style, attributional style, and stress however demonstrated issues with the single-item approach which may serve to highlight the importance of careful design of single-item measures and the necessity of testing single-item measures for each new variable under consideration. Further research is however required to confirm whether item design is the only explanation for these findings or if these factors, particularly coping style and attributional style which have not had single-item measures used for them in the past, may not be suitable for such a brief measurement approach. The results are consistent with those of other research presented in Chapter 3 and with the conclusions of that chapter regarding the necessity to examine the single-item approach for a wider range of variables.

4.10 Diagnostic validity

The results of the diagnostic validity analysis suggest that groups created based on scores from single-item measures would be consistent with those created using multi-item measures.

4.10.1 Depression and anxiety
In terms of depression and anxiety, between 71% and 86% of those with likelihood of these issues would be correctly identified with a score above 5 on the single-item measure. In the current sample this means that six people with mild-severe depression and 7 people with mild-severe anxiety would be incorrectly judged to have no depression or anxiety issue. At the same time, between 73% and 87% of those in the normal range for depression or anxiety would be correctly identified using a score below 5 on the single-item measure.

These results compare well with previous research on diagnostic validity. For example, (Mitchell, Meader, & Symonds, 2010) performed a meta analysis of the HADS compared to psychiatric interview in cancer settings. Across all applications of the HADS, depression sensitivity ranged from 71.6% to 82% and specificity between 77% and 82.6%. For anxiety, sensitivity ranged from 48.7% to 83.9% and specificity between 69.9% and 78.7%. Comparing these results to those found using the single-item measures, it can be concluded that overall the single-item measure performs equally well as a substitute for the HADS as the HADS does as a substitute for psychiatric interview.

4.10.2 Mood, satisfaction, and stress
It was proposed that assessments may be used in practice to determine high and low well-being groups based on a median split of scores. If this was performed using a multi-item measure of

each outcome, then the results indicate that 63% of those with high negative mood, 78.5% of those with low positive mood, and 92.8% of those with low life satisfaction would be identified the same way if the single-item had used for each outcome. The results indicate some bunching around scores, for example 90% of those in the low negative mood group score below 4, however only 56% score below 3. The single-item measures may therefore be better implemented with multiple cut-off points representing risk, for example in the case of positive mood only 1.5% of those with low mood scored above 8 and only 2% of those with high mood scored below 5, suggesting that upper and lower bands may be implemented, with those close to the boundaries worthy of further assessment or monitoring. In this way the single-item measure would act as a suitable screening tool for the most straightforward cases in the way that has been suggested by Cronbach (1990), allowing further examination of more borderline scores to be examined more thoroughly where necessary. The results are also congruent with conclusions made by Sloan (2002) that single-item measures can be appropriate and may be used in conjunction with more detailed follow up if necessary.

Stress provided a less accurate diagnostic tool as expected due to the smaller correlation between the single- and multi-item measures. Sensitivity and specificity were 45.9% and 32.2% using a median split and 10% of those in the high stress group based on the multi-item measure scored 1 on the single-item measure, while 5.4% of those in the low stress group scored 5 on the single-item measure. This further highlights the lack of validity of the stress item compared to the other items and provides support for a newly designed stress item.

4.10.3 Diagnostic validity summary
Overall the single-item measures appear to be appropriate alternatives to longer measures as indicators of well-being, providing largely consistent results between multi-item and single-item methods. Although the median split approach is not an ideal way to determine if those with truly low or high well-being would be correctly identified, the results provide some indication that the single-item responses represent a valid range of scores on these variables and a valid alternative in the context of practical application, with the exception of the stress item, potentially due to design flaws. If, in practice, well-being outcome measures were used to group respondents based on their scores, the results indicate that single-item measures would provide largely similar groups and may be useful as an initial screener for well-being issues.

4.11 Reliability

4.11.1 Reliability discussion
The average estimated reliability of the single-item measures was .52, however removing the items with proposed design issues and subsequent non-valid scores gives an average of .64. This estimate is identical to that found by Wanous et al (1997) for job satisfaction measures. Many of the single-item measures have comparable estimates with the alpha reliability of their multi-item counterpart (e.g. Demands .71 (single-item) .77 (multi-item) and supervisor relationship .92 (single-item) .94 (multi-item) (see table 4.10)). The pattern of results is similar to that in the validity of the items, with those items having lowest correlations with their multi-item counterparts also having the lowest reliability estimates of .35 (control), .40 (agreeableness) and .45 (self-efficacy).

While a guidance coefficient alpha of .70, depending on purpose, is commonly used (Nunnally, 1978) others have cited reliability estimates of .50 or greater as acceptable for multi-item measures in group comparisons (Van Saane, et al., 2003) and these estimates are given for multi-item measures. The average estimated reliability for the single-item measures in this study was above the .50 level and a range of items from demands to self-esteem and positive mood were above .70. At the same time, excluding those items concluded to have validity concerns potentially related to item design, 7 items had reliability estimates below .50, although it should also be noted that this analysis approach provides a minimum estimated reliability and that true reliability may be higher but not lower (Wanous, et al., 1997). The results do suggest that, where possible, multi-item measures would be more suitable for research purposes as they provide more consistently high reliability scores, however they also indicate that the estimated reliability of single-item measures is generally not prohibitively lower if practical concerns dictate their need.

4.11.2 Summary
Considering these results as a whole, it appears that rather than indicating that single-item measures have inherently poor reliability, a valid conclusion would be that single-item measures can display adequate to good reliability and further research should establish whether characteristics of the items, the comparison measure, or the construct itself are the key factor associated with poor reliability estimates when they occur.

Alternatively, research should establish whether the reliability in terms of estimated internal consistency is a suitable criteria on which to base the use of single-item measures. Psychometrically speaking, a valid item cannot have poor reliability (Nunnally, 1978) and predictive validity is the primary attribute of a predictive variable (Nunnally, 1978), so these indicators of a good measure may be sufficient. Furthermore, it has been suggested that internal consistency may have little effect on scores in terms of stability over time or correlation with the true score (Jenkins & Taber, 1976) and may also be a catalyst for overly lengthy measures that constrain validity to inflate coefficient alpha (Drolet & Morrison, 2001). Although estimates of

internal consistency provide an indicator of the reliability of scores on measures therefore, they should be considered alongside other aspects of the measure such as validity and practicality, as suggested by Nunnally (1978) and these results indicate that in this larger picture the reliability estimates of the single-item measures are not unacceptably low as has been supposed of single-item measures in the past (Wanous, et al., 1997).

4.12 Study 1 summary and introduction to Study 2

Study 1 provided some promising results regarding the use of single-item measures for the purpose of measuring a variety of variables involved in the well-being process. Items related to the variable groups of demands, resources, individual differences, personality, and outcomes that make up the DRIVE framework used were found in many cases to provide adequate psychometric properties. Exceptions to this however were coping style, attributional style, and stress measures. Two potential explanations for this are firstly that the design of the measure impacted the validity of the item and alternatively that the construct itself requires more items to be accurately represented.

As discussed in Chapter 3, a key factor in the use of single-item measures is the design of the item in terms of how the item relates to the comparison measure and the user's interpretation of the item. Chapter 3 discusses how a single-item measure relies heavily on the user's understanding and that this is dependent on how well the item portrays the construct under consideration. Furthermore, in order to provide reliability against another measure, the user's understanding of the construct under question must be similar between the single-item measure and the comparison measure. This has also been suggested by Jenkins and Taber (1976) and similarly, Scarpello and Campbell (1983) suggest that a single-item measure must be unidimensional in nature and easily understood.

This explanation seems plausible as, in contrast to the other items, the stress item followed the design of a previously used stress item and did not contain an explanation of the construct that included examples. The coping items also could be considered to be lacking unidimensionality as multiple factors were categorised into positive and negative coping groups and represented by a single item. The attributional style measures however did include multiple items that represented their respective construct and may therefore provide evidence for the alternative explanation, that the construct is not easily represented by a single-item measure.

In summary, the results appear to represent the negative impact of an imbalance in the favour of practicality over accuracy and in each case these flaws can be associated with issues previously discussed, such as creating congruence between respondents' understanding, single-item design, and multi-item comparison (Chapter 3). However, it is also possible that the nature of the variables involved also contributed to the results and, in order to confirm design issues as a

cause, newly designed items for these variables were introduced in a sample of nurses and the analysis repeated for these variables. Descriptive statistics were also examined for all the items in comparison to the staff sample in study 1.

Another potential issue for the single-item measures raised by the research is the possibility that the items may not distinguish well between closely associated variables, leaving potential for redundancy when using multiple indicators. This issue is covered in Chapter 5.

4.13 Method Study 2

4.13.1 Participants

One hundred and sixty female and seventeen male nursing staff aged 19 to 69 completed the questionnaire. The mean age of the sample was 40 years, the majority were married or living with a partner (66.5%), educated to degree or higher degree level (86.6%), described themselves as white (84.9%) and earned > £25,000 per year (50.6%). Participants from all areas of nursing responded to the survey, including practitioners, educators, and managers.

4.13.2 Materials
The questionnaire consisted of the single-item measures from Study 1 with newly designed items to examine the cause of poor validity for some variables in the previous study. Coping style was now measured using a single-item for each of the five individual styles. The attributional style single-item measures were re-designed to attempt to provide more guidance on the specific situations that should be considered. Stress and satisfaction were now measured as independent items for life stress, life satisfaction, job stress, and job satisfaction. The expanded nurses stress scale was included to provide a comprehensive comparison measure for stress in nurses. These items can be found in Appendix 4.7 as a copy of the questionnaire. The newly designed items are also shown on the following page.

<u>Coping style</u>
(Problem focused) When I find myself in stressful situations, I take a problem-focused approach (e.g. I take one step at a time, I change things about the situation or myself to deal with the 1issue, I don't let my feelings interfere too much).
(Seek social support) When I find myself in stressful situations, I look for social support (e.g. I talk to someone to get more information, I ask someone for advice, I talk to someone about how I'm feeling).
(Blame self) When I find myself in stressful situations, I blame myself (e.g. I criticize or lecture myself, I realise I brought the problem on myself).
(Wishful thinking) When I find myself in stressful situations, I wish for things to improve (e.g. I hope a miracle will happen, I wish I could change things about myself or circumstances, I daydream about a better situation).
(Avoidance) When I find myself in stressful situations, I try to avoid the problem (e.g. I keep things to myself, I go on as if nothing has happened, I try to make myself feel better by eating/drinking/smoking).

<u>Attributional style</u>
(Positive internal) Do you believe that positive events (for example: a promotion at work, receiving a compliment, a successful project) are beyond your control (e.g. due to good luck or other influences) or within your control (e.g. due to hard work or determination)?
(Positive global) Do you believe that the rating you have given above applies to all positive events or only some positive events?
(Positive stable) How likely is it that the rating you have given to part 1a above will apply to positive events in the future?
(Negative internal) Do you believe that NEGATIVE events (for example: being unable to find a job, being unable to do the work asked of you, someone being hostile towards you) are beyond your control (e.g. due to bad luck or other influences) or within your control (e.g. due to poor planning or lack of consideration)

(Negative global) Do you believe that the rating you have given above applies to all negative events or only some negative events?

(Negative stable) How likely is it that the rating you have given to part 2a above will apply to positive events in the future?

<u>Satisfaction and stress</u>
(Life stress) Overall, how stressful is your life outside of work?
(Job stress) Overall, how stressful do you find your job?
(Job satisfaction) Overall, how satisfied are you with your current job?
(Life satisfaction – as study 1) Overall, I feel that I am satisfied with my life (For example: In most ways my life is close to my ideal, so far I have gotten the important things I want in life).

4.13.3 Procedure

Prospective participants were notified of a study on well-being assessment through UNISON and those who expressed interest were sent a link to an online questionnaire which they could complete in their own time and which took approximately one hour. Participants were instructed that they could skip any questions they were not comfortable answering, although all data were provided anonymously.

The analysis procedure was the same as the first study.

4.14 Results Study 2

4.14.1 Data preparation

Data were assessed for missing values greater than 10%. Problem focused coping (full measure) had 11.2% missing data. Multiple imputation was used to replace missing data based on responses on present data on problem focused coping and seeking social support as the only significantly correlated coping style. Imputation replaced values for all 16 respondents with

missing data. The mean score was 37.44 and standard deviation 5.90 before imputation and mean 37.53 and standard deviation 5.76 after imputation.

4.14.2 Outliers

Using criteria of z-score > 3.29 for identifying outliers, one outlier existed for the multi-item avoidance measure, with a score of 34 compared to mean 18. The distribution was not skewed by this outlier and the score was only 2 points greater than the next highest, so the data were considered relevant and left unaltered.

4.14.3 Normality

Skewness and kurtosis was greater than 1.0 for role, positive internal attributions (short), agreeableness, conscientiousness, positive stable attributions (short), avoidance (short), consultation on change, and life stress. A square root transform provided values below 1.0 in all cases.

4.15 Descriptive statistics

The difference between nurses and staff is mostly limited to differences in work characteristics, while scores on individual differences are very similar.

In terms of work characteristics, the nurses sample scores higher on some positive and negative variables, with higher demands, effort, and bullying but also higher reward and role understanding. Individual differences are much more comparable, with the largest difference being .6 for emotional stability compared to a difference of 1.9 for demands and 4.1 for role understanding.

Table 4.12: Descriptive statistics for the nurses results compared to the corresponding statistics for the staff results

Variable	N	N (staff)	Minimum	Maximum	Minimum (staff)	Maximum (staff)	Mean	Mean (staff)	Standard Deviation	Standard Deviation (staff)
Demands	179	118	1	10	1	10	6.0	4.1	2.56	2.31
Control	179	120	1	10	2	10	5.9	6.7	2.28	2.05
Support	179	119	1	10	1	10	7.0	6.8	2.22	2.24
Effort	178	120	1	10	1	10	6.7	5.0	2.67	2.46
Reward	178	120	1	10	1	10	6.4	5.9	2.29	2.39
Role	176	120	1	10	1	10	7.6	3.5	2.55	2.61
Change	178	116	1	10	1	10	5.3	5.0	2.90	2.50
Supervisor Relationship	178	119	1	10	1	10	6.7	7.1	2.57	2.59
Bullying	178	119	1	10	1	10	3.5	2.8	2.96	2.73
Optimism	178	120	1	10	1	10	6.3	6.5	2.20	2.26
Self Efficacy	178	117	2	10	3	10	7.4	7.5	1.65	1.74
Self Esteem	178	120	1	10	2	10	6.8	6.9	2.17	2.24
Extraversion	176	120	1	10	1	10	6.3	6.3	2.19	2.26
Agreeableness	178	120	3	10	4	10	8.5	8.2	1.44	1.23
Conscientiousness	177	120	1	10	2	10	8.1	8.1	1.66	1.63
Emotional Stability	178	120	3	10	1	10	8.0	7.4	1.48	1.81
Openness	178	120	3	10	1	10	7.9	7.7	1.60	1.94

	N	N	Min	Max	Min	Max	Mean	Mean	SD	SD
Positive Coping		119			3	10		7.5		1.80
Problem-Focussed	178		1	10			6.8			1.95
Seeks Social Support	178		1	10			6.7			2.35
Negative Coping		120			1	9		4.4		2.28
Blame Self	178		1	10			4.8		2.42	
Wishful Thinking	178		1	10			6.0		2.53	
Avoidance	179		1	10			4.3		2.65	
Positive Internal	179	120	2	10	2	10	7.3	6.5	1.77	1.77
Positive Stable	179	120	1	10	3	10	7.6	7.5	1.70	1.26
Positive Global	178	120	1	10	2	10	7.2	6.7	1.74	1.70
Negative Internal	179	120	1	10	1	10	5.3	5.3	2.02	2.00
Negative Stable	179	120	1	10	1	10	6.8	6.3	1.81	1.77
Negative Global	179	120	1	10	1	10	6.1	5.9	1.99	1.85
Positive Mood	179	117	1	10	2	10	6.6	6.9	2.15	1.88
Negative Mood	179	118	1	10	1	9	4.0	3.4	2.39	2.11
Depression	179	119	1	10	1	9	3.5	3.6	2.14	2.11
Anxiety	179	120	1	10	1	10	4.7	5.2	2.36	2.33
Life Satisfaction	178	120	1	10	1	10	6.6	6.4	2.20	2.16
Stress	179	120	1	10	1	5	5.0	2.4	2.59	0.87
Job Satisfaction	179		1	10			6.7		2.40	
Job Stress	179		1	10			6.6		2.40	

4.16 Concurrent and discriminant validity (newly designed items)

4.16.1 Coping Style
The new coping style items did not show an overall large improvement in validity but did provide preferable results.

The newly designed single-item measures showed comparatively poor construct validity for problem focused coping and moderate validity for the rest. This represents vastly improved representation of seeking social support but reduced representation of problem focused coping (.20 compared to .40 in the previous study). Results regarding the negative styles are moderately improved (.35 to .40 compared to .44 to .54) in terms of construct validity, but discriminant validity indicates that the reason the single negative coping style item provided good representation of each is because these styles seem to be correlated with each other. In comparison, problem focused coping and seeks social support seem to not be correlated and so the single-item positive coping measure in the previous study was not suitable.

Table 4.13: Correlations between single-item coping measures (rows) and multi-item coping measures (columns) in the nurses sample. Bold values represent the highest correlation for that single-item measure.

	Problem Focused	Seeks Social Support	Blame Self	Wishful Thinking	Avoidance
Problem Focused	$.20^{**}$	$.19^{**}$	$-.22^{**}$	$\mathbf{-.31^{***}}$	$-.27^{***}$
Seeks Social Support	.02	$\mathbf{.32^{***}}$	$-.16^{*}$	$-.21^{**}$	$-.30^{***}$
Blame Self	-.03	-.07	$.44^{***}$	$.35^{**}$	$\mathbf{.47^{***}}$
Wishful Thinking	$-.25^{**}$	$-.27^{***}$	$.20^{**}$	$\mathbf{.58^{***}}$	$.40^{***}$
Avoidance	$-.16^{*}$	$-.17^{*}$	$.23^{**}$	$.51^{***}$	$\mathbf{.54^{***}}$
N	175	170	175	167	166

4.16.2 Attributional Style

Newly designed attributional style measures do provide improvement but still remain unsuitable. In terms of concurrent validity the results are somewhat improved, particularly in regards to positive internal and negative stable attributions which now correlate .32 and .42 (p < .001) with their multi-item counterparts, however many scores are still not at all correlated (e.g positive global attributions .07). Overall the results are still very poor; negative internal attributions has little correlation with any of the multi-item measures while negative stable attributions correlates .30 with its corresponding multi-item measure and .29 with the multi-item measure of negative global attributions.

Table 4.14: Correlations between single-item attributional style measures (rows) and multi-item attributional style measures (columns) for the nurses sample. Bold values represent the highest correlation for that single-item measure.

	Positive Internal	Positive Stable	Positive Global	Negative Internal	Negative Stable	Negative Global
Positive Internal	**.42*****	.32***	.14	-.18*	-.04	-.10
Positive Stable	.14	**.26****	.10	-.00	.07	.01
Positive Global	.09	**.14**	.07	.02	.04	.01
Negative Internal	-.11	-.02	-.05	**.14**	.09	.04
Negative Stable	-.06	.20**	.22**	.04	**.30*****	.29***
Negative Global	-.02	.24**	**.25****	.04	.24**	.22**
N	173	167	165	175	167	165

4.16.3 Stress

The life stress measure correlated .12 (n.s.) with the expanded nurses stress survey while the job stress measure correlated .41 (p < .001) indicating that an independent approach to life and job stress using single-item measures is more appropriate.

4.17 Reliability estimates

Reliability estimates remain poor for positive coping styles and attributional style in general (below .20) but moderate for negative coping styles and positive internal attributions (.28 for self blame to .47 for wishful thinking).

Table 4.15: Reliability estimates for the single-item measures in the nurses sample compared to those found in the staff sample.

Variable (Coping style and stress)	Staff Reliability	Nurses Reliability	Variable (Attributional style)	Staff Reliability	Nurses Reliability
Problem Focused		0.06	Positive Internal	0.24	0.42
Seeks Social Support		0.16	Positive Stable	0.16	0.12
Blame Self		0.28	Positive Global	0.00	0.01
Wishful Thinking		0.47	Negative Internal	0.06	0.05
Avoidance		0.45	Negative Stable	0.04	0.14
Stress	0.07	.22	Negative Global	0.02	0.07

4.18 Study 2 Discussion

4.18.1 Introduction
Single-item measures of well-being variables were presented to a sample of nurses. The measures included newly designed coping style, attributional style, and stress items, in order to determine if these new designs would provide better validity and reliability results to those found in the staff sample.

4.18.2 Comparisons to Study 1
The descriptive statistics suggest some differences in workplace factors such as demands, effort, and role. University staff had lower demands but more control, while nurses had a much greater understanding of role. Mean scores for other factors such as personality and outcomes are however similar, suggesting limited differences between the samples of university staff and nurses in the personality types of employees, based on these single-item measures.

4.18.3 Coping style
The newly designed coping style items provided an overall moderate increase in validity. Independent items for problem focused and seeks social support coping styles showed correlations of .20 and .32 with their multi-item counterparts, representing reduced validity for the problem focused measurement but improved validity for seeks social support measurement compared to a single-item 'positive coping' item at .40 and -.03 respectively. The respective correlations for blame self, wishful thinking, and avoidance were .44, .58 and .54, representing an overall improvement from a single-item 'negative coping' question which gave relative correlations of .40, .35, and .36. Although correlations across emotional coping items were also moderate (e.g. .40 for wishful thinking and avoidance) other research has also shown high correlations across these variables using multi-item measures of up to .87 for wishful thinking and avoidance in medical students (Vitaliano, et al., 1985), suggesting a potential issue in terms of redundancy rather than measurement approach.

Reliability estimates for the positive coping style items were poor at .06 and .16 for problem focused and seeks social support. Estimates were better for self blame at .28 and more in line with previous research for wishful thinking and avoidance at .47 and .45.

These results suggest that single-item measures of the emotional/negative coping styles may be useful, while the validity of the problem focused and social support items was still below par compared to many other variables. The proposition that difficulty in measuring coping style using single-item measures was due to measure design was partly supported, however it appears that problem focused and seeks social support coping styles may not be suitable for measurement using single-item scales. Single-item measures will be able to account for coping style in terms of the impact of emotional/negative coping, however the benefit of positive coping methods cannot be accurately accounted for using the single-items.

The finding that problem focused coping and seeking social support are not validly represented using a single-item measure, while self blame, avoidance, and wishful thinking items provide more representative scores, may be due to the complexity of coping behaviour, with problem focused coping and seeking social support being more situation specific. For example, problem focused coping is likely to be associated with the specific problem in hand in terms of whether or not it is employed (Carver, et al., 1989) and the specific type of behaviour is likely to be variable dependent on the specific problem. Seeking social support may also be used for emotional or practical purposes (Carver, et al., 1989) and therefore may vary depending on situation. This may explain why a single item does not capture these types of coping as well as emotion-focused coping as the item will need to represent a wider range of situation specific behaviours within the category of 'problem-focused'. In contrast, the multi-item measure may account for this by representing a range of behaviours for each style, and the need to represent more behaviours in the problem-focused group is supported by the greater number of items in the multi-item measure representing problem-focused coping compared to those representing emotion-focused coping.

4.18.4 Attributional style
The newly designed attributional style items provided little to no improvement overall and the results suggest that measurement of attributional style involving specific examples of life events and associated causes does not translate well into a single-item measure. Results were largely similar to Study 1, with correlations between the single- and multi-item measures of the same aspects of attributional style as low as .07, although positive internal attributions correlated more strongly at .42. The reliability of the positive internal attributions item was also improved at .42 compared to .24 in the previous study, but the remainder of the variables remained below .15 in this regard.

The improvement of the positive internal attributions item compared to the extremely poor results of the other items suggests it is not purely the design of the single-item measure that has caused such poor results, as if this was the case there should logically be a similar improvement in other items, particularly internal attributions of negative events. The results must therefore indicate that it is the attributional style constructs that are limiting the associations, possibly due to an inability for the constructs to be properly represented using single-item measures. It may be that the behaviour of attribution of events is too complex to be measured broadly and must be measured using the categorisation of multiple individual examples as with the multi-item measure.

4.18.5 Stress
The conclusion that the results for the stress item in the previous study were due to the need to distinguish between job and life stress in the single-item measure was supported by the fact that a specific job stress item correlated strongly with the multi-item work stress measure (r = .41), while the specific life stress item did not (r = .12). The reliability of the stress item could however still be improved at .22. A potential avenue for improvement to this may be to include

examples with the item as with the newly developed single-item measures, as the stress items instead follow previously used stress items (Smith, et al., 2009) and do not include such examples.

4.19 Final Conclusions

The purpose of this chapter was to determine the validity and reliability of new single-item measures of multiple aspects of the well-being process.

Single-item measures of a range of variables were assessed in comparison to established multi-item measures of the same variables to examine whether the reduction in items to improve practicality had a significant impact on the ability of those items to represent the constructs of concern in well-being.

4.19.1 Construct and discriminant validity
The results showed the newly developed items appeared to be largely representing the constructs they were intended for, based on the degree of correlation between the single-item measure and the multi-item measure, compared to the correlation with multi-item measures of other constructs.

These results add to the depth of research for a number of variables, particularly well-being outcomes such as depression and anxiety as well as personality characteristics, which made up the majority of variables studied in articles reviewed in Chapter 3. Results in the current chapter were largely congruent with those from Chapter 3 and confirmed the suitability of single-item measures to assess these variables in situations with limited resources.

As well as adding to the depth of research on single-item measures, the results also broaden the research on the application of single-item measures in terms of their application to a wider range of variables. Single-item measures of a number of important variables, particularly work characteristics, were not identified in previous research and even brief measures, for example the DCSQ, use multiple items to measure each construct involved. The results of this study demonstrate that single-item measures are also suitable for many of the variables included in work characteristic models and in some cases show very high validity and reliability estimates that would be expected of much longer scales (e.g. supervisor relationship).

While the above conclusions apply to the broad range of variables involved, the results also demonstrate that some variables were not suitable for the single-item approach used in this study. These results apply particularly to attributional style measures and also somewhat to positive coping behaviours. The results of a second study showed the design of the measure could not

completely explain very poor reliability and validity estimates and therefore may demonstrate examples of variables for which single-item measures are not appropriate. This also demonstrates that positive results from single-item measures of some constructs should not be assumed to apply to other variables and research should be performed on further variables before the approach is applied more broadly.

4.19.2 Discriminant validity

Discriminant validity in this study was assessed based on correlations between single-item measures and multi-item measures of similar constructs, rather than those completely unrelated. This provided an indicator of the single-item measures' ability to discern between closely related constructs as criteria for their suitability for a multi-dimensional approach. Although in many cases the difference in correlation across variables compared to measures of the same construct indicated discriminant validity, the results also suggest some potential for overlap in closely related variables, such as optimism, self-esteem, and self-efficacy as well as demands and effort, where, in some cases, higher (although not necessarily significantly so) correlations were found with a single-item and a multi-item measure of another construct. Further research should therefore establish whether this means that single-item measures are not suitable for distinguishing between unique variance associated with closely related variables, with their unique predictive validity being a potential source of this comparison.

4.19.3 Diagnostic validity

Single-item measures of variables with defined cut-offs for depression and anxiety correctly identified over 70% of respondents in each group with a reduction of items from 14 to 2. These results are line with research reviewed in Chapter 3 and support conclusions from a number of those studies that single-item measures can provide a suitable initial screening tool where necessary.

For other outcome variables where no cut-off is established, those in high and low groups based on a median split were also largely congruent when groups were created using a single-item or the multi-item measure, again providing a suitable potential brief screening tool.

4.19.4 Reliability

The research also provides a significant contribution to information on the reliability of single-item measures, where internal consistency estimates are not commonly used and there is a common perception that estimates of internal consistency in single-item measures is not possible and, if it were, the results would be unacceptably poor (Wanous & Hudy, 2001). These results add to previous research by Wanous et al (1997) by demonstrating that acceptable reliability estimates can be provided for single-item measures of a range of variables and that while some items may present poor reliability almost an equal amount have minimum estimates above .60 and many above .70. Although in many of these cases single-item measures do present poor reliability, it is difficult to compare these results to multi-item measures on a criteria that depends on the number of questions for a variable as well as the quality of those questions. A more

accurate limitation of single-item measures may therefore be that the reliability of a poorly designed single-item item cannot be countered simply by adding more items to the measure to inflate the reliability estimate. The true limitation may however be in the use of a reliability estimate in this way for single-item measures, rather than using alternative assessments of measures such as the item-response theory approach, which does not involve reliability (Embretson & Reise, 2000).

4.20 Chapter Summary

The analysis presented in this study was intended to act as an important exploratory examination for the newly designed measures but also to establish whether the reduction in items for practical purposes would reduce the accuracy of these items for identifying the correct constructs to unacceptable levels.

For many of the variables involved, based on previous research and criteria such as that presented in Chapter 3, the newly developed items appeared to be measuring the constructs with appropriate accuracy that was not largely affected by using such brief measures. However, this general result also highlighted the inadequacy of the positive coping measures and the attributional style measures. The results however only present evidence for the accuracy of scores on these variables and further research on the single-items involving predictive validity and unique variance, is needed.

The following table shows the items developed within each variable group ordered into good, moderate, and poor groups. Those in the good group showed good results with no specific reason to discontinue use, those in the moderate group had moderate to good results but highlighted caution in terms of their potential for overlap with other variables, and those in the poor group showed results that suggest that their use should be reconsidered entirely.

The next stage of the research will establish the performance of these items further in terms of the predictive validity of work characteristics, coping, and personality on well-being outcomes and their independent contributions to well-being.

Table 4.16: Provides a summary of the results from the nurses and staff samples in terms of the performance of each measure relative to each other.

	Work Characteristics	Individual Differences	Personality	Outcomes
Good	Support Supervisor Relationship Bullying Role understanding Reward	Wishful thinking Avoidance	Extraversion Conscientiousness Agreeableness Openness Emotional stability	
Moderate	Demands Effort Control	Self Blame	Self esteem Self efficacy Optimism	Stress Satisfaction Positive mood Negative mood Depression Anxiety
Poor		Problem focused Seeks social support Attributional style (all items)		

4.21 Limitations

A larger sample would provide more generalisable results, however confidence in the results can be maintained by comparison across studies, with many in line with previous research on the same variables and the results for coping and attributional style which were not in line with previous findings being repeated in a second sample.

A limitation related to the sample is however that they represent largely well educated, working adults from university and medical environments. This may provide results which represent those who have a good understanding of the constructs involved and an ability to make a good judgment of the concept the single-item measure is referring to. It may therefore be that those who are less well educated or familiar with the constructs involved may produce poorer representations using the single item measures. The make-up of the sample also means that the items may be less representative of those who may score at the extreme ends of the variables.

Another potential limitation is having the multi-item measures and single-item measures in the same questionnaire, as each item may influence the score on the other. Similarly, measures of

associated variables such as demands and effort may also influence each other. The questionnaire was designed to limit this by not putting the related single- and multi-item measures next to each other and by presenting all the multi-item measures after all the single-item measures had been completed. Both these choices created temporal distance between the items, however, some memory effect cannot be ruled out.

Another limitation is that the study involved a broad range of measures and ideally a more focused study or series of studies would have provided a more desirable approach to researching these variables. This would represent a more in-depth approach that would start with few variables and build up in terms of breadth, providing more comprehensive study of specific measures at each stage of the process. However, the chosen approach of starting with a broad range of variables and potentially reducing down by removing the poorly performing items was determined to be more appropriate to the project as it would: be more practical in terms of the resources and time constraints of the project, better represent the already established multi dimensional nature of well-being, examine the relative importance of variables that have potential to be redundant alongside each other, and to establish the most significant variables in the process. The limitation of this is that weaker variables or more complex relationships that may be appropriate for applications not primarily concerned with practicality are less well represented and that the potential impact of error and inflation is increased.

An alternative approach could also have been taken regarding the development of the single-item measures, which may have provided better results. In the design of the single-item measures the example items taken from the multi-item measures were done so to provide a representation of the breadth of the items in the multi-item measure. An alternative approach would have been to use factor analysis on the multi-item measure to choose examples with the strongest loading. This method may have provided better results as the inclusion of items with poorer loading on the factor would be more likely to lead respondents away from the construct. It is also possible however that the highest loading items would be most likely to be so closely related as to reduce the benefit of including example items in the single-item measure. Additionally, if a multi-item measure is properly developed and validated then every item should load strongly on the factor. The factor analysis approach does however provide a possible approach to improving the validity of single-item measures that may be explored in future research.

A limitation of using the second study to examine whether the design of the stress, coping, and attributional style items was the cause of the poor psychometric properties found for these items in the first study is that the population also changed between studies, adding another potential source of variability between findings. Further research would therefore be beneficial whereby the same sample is used but multiple designs tested.

Finally, the single-item measures are compared to only one multi-item comparison with its own error in measurement and therefore the conclusion on how well the single item measure represents each construct is limited by the ability for the multi-item measure to do so. It is not

conclusive therefore how well the single-item measure really represents each construct. The multi-item measures, however, do accurately represent how these constructs would normally be measured in practice and therefore the results are relevant in terms of how valid and reliable the single-item measures are as alternatives to these. This is in line with the intention of the measures – to provide a practical alternative with acceptable comparative performance.

Chapter 5 – Comparing single- and multi-item measures for the prediction of well-being outcomes

5.1 Introduction

This chapter presents a continuation of the analysis of the single-item measures. While the previous chapter focused on the content of the measures, this chapter presents analysis of the predictive validity of work characteristics, individual characteristics and personality items in relation to well-being outcomes.

As discussed in Chapter 2, the management of well-being involves a wide range of variables including circumstances and individual differences that are believed and have been shown to predict well-being outcomes. Although the results of Chapter 4 provide the construct validity and estimated reliability of the items, predictive validity is a separate characteristic that represents the most important psychometric property of an item intended to predict an outcome (Nunnally, 1978). Furthermore, predictive validity analysis provides a method of further determining the independent contribution of items found to be potentially overlapping in Chapter 4. The present chapter therefore represents analysis of the predictive validity of the items developed in Chapter 4 and further compares their performance to that of the multi-item measures they are intended to replace.

5.1.1 Assessing predictive validity
In practice, predictor variables can be used to determine who is likely to be at risk of a negative outcome and on that basis may also be used in practice to identify the most likely reasons for a particular outcome (for example, depression) to be present. Predictor variables are therefore useful in practice to identify those at risk of poor well-being in the future or to provide information on the most appropriate course of action when negative well-being is high or positive well-being is low.

Predictive validity is commonly assessed by determining the amount of variance in the criterion variable (outcome) that is predicted by the predictor variables and is commonly assessed using

multiple regression when multiple variables are thought to contribute to the criterion (Tabachnick & Fidell, 2007). Hierarchical multiple regression is often used where groups of variables are entered into the regression model in stages to determine their relative contribution. Using this method, the contribution of a variable or group of variables to prediction of variance in the criterion can be assessed for statistical significance, to determine the contribution to predictive validity beyond those variables entered in previous stages. For example, Parasuraman et al (Parasuraman, Purohit, Godshalk, & Beutell, 1996) used a series of hierarchical multiple regressions when examining work, family, success, and well-being, entering work and family domain variables separately to assess their contribution to well-being prediction relative to each other. Suh, Diener, & Fujita (1996) used hierarchical multiple regression to examine the effects of events on well-being. In their analysis, time 1 personality was entered into the regression, followed by recent events, and then distal events on criterion measures of time 2 life satisfaction, positive affect, and negative affect. Using this approach, the researchers could determine whether recent and distal events contributed independently to well-being and also whether this contribution was beyond that provided by personality. Personality and recent life events were significant predictors of current SWB, and recent events predicted beyond personality while distant events did not. This type of analysis therefore has clear benefits to the current context of practical measure development in terms of identifying which variables are significant predictors of well-being outcomes and whether each contributes to that prediction beyond the others, or is redundant.

Similar methods were therefore employed in the present analysis to explore the overall and unique prediction of well-being outcomes by single-item predictor measures, in comparison to their multi-item counterparts.

5.1.2 Total variance predicted by single-item measures

<u>Comparison to multi-item measures</u>

The use of multiple regression to examine predictive validity provides a way of further comparing single-item measures to their multi-item counterparts in terms of how the predictor variables perform as predictors of well-being outcomes. As well as a direct comparison of each measurement approach, this allows us to examine the predictive validity using single-item measures to provide a multi-faceted approach (i.e. including work characteristics, individual differences and personality), compared to the predictive validity of using the same questionnaire space to measure fewer factors more comprehensively. Comparing the variance predicted by measuring multiple factors with single-item measures to that predicted by measuring fewer factors using multi-item measures allows us to quantify the benefits of each. This analysis is particularly relevant to well-being research, as it has been suggested that the combination of variables provides better prediction of well-being outcomes (Smith, et al., 2004) but also that questionnaire space limitations can limit the amount of variables that can be measured (Drolet

&Morrison, 2001), while multi-item measures provide better psychometric properties (Nunnally, 1978; Diener, et al., 1999; Cronbach, 1990). As the multi-faceted approach is a primary rationale for the use of single-item measures and the DRIVE model, the results of this comparison will indicate whether the benefit of practically measuring multiple facets enabled by using single-item measures outweighs the greater fidelity from using multi-item measures.

Accounting for multiple outcomes

It has been suggested that different well-being outcomes have unique variance and can therefore have unique relationships with predictor variables (Busseri, et al., 2007; Diener, et al., 1999). The relative contribution of each set of variables may therefore also depend on the specific outcome under investigation, with some variables providing significant unique prediction of some outcomes but not others.

Although distinctiveness in outcomes on an individual level has been proposed even in closely related outcomes such as domain and life satisfaction (Larsen, et al., 1985), in the present analysis the examination of all of the potential relationships between each predictor and outcome would present an impractical number of comparisons. To account for this issue while still acknowledging the potential differences in relationships across well-being outcomes, individual outcomes in the current study were combined into four groups. These groups comprised of positive cognitive appraisal, negative cognitive appraisal, positive emotional, and negative emotional groups in order to acknowledge differences between cognitive well-being and emotional well-being, and positive well-being and negative well-being, as described in Chapter 2.

Cognitive components of well-being such as life satisfaction represent a judgment of one's circumstances and may therefore be more strongly predicted by variable such as demands (Pavot & Diener, 1993), while personality is perhaps the strongest predictor of emotional well-being outcomes such as positive or negative mood (DeNeve & Cooper, 1998). In terms of the positive and negative distinction, well-being definitions and policy suggest that the presence of positive should be considered alongside the absence of negative well-being issues (Parkinson, 2007; Smith, et al., 2009; WHO, 2012) and, on a narrower scale, positive mood and negative mood have also been demonstrated as independent facets rather than opposite ends of the same spectrum (Busseri, et al., 2007). Therefore, the distinction between positive and negative well-being may also reveal a distinction in the factors associated with these outcomes. Such a distinction has previously been demonstrated by Smith et al (2009) where positive and negative well-being were more strongly related to positive and negative circumstances respectively. Throughout research on SWB it has been demonstrated that different aspects of well-being should be acknowledged separately (Diener, et al., 1999; Pavot & Diener, 1993) and the creation of these groups allows for this while still managing the number of comparisons in the analysis.

5.1.3 Identifying unique contributions using single-item measures

The second way in which predictive validity is important in the current context relates to the individual contribution of variables. The application of the DRIVE model used in this research provides a framework for the inclusion of multiple variables in the form of work characteristics (both demands and resources), individual differences such as coping style and attributional style, and personality characteristics including both broad (e.g. extraversion) and narrow (e.g. self-esteem) examples. Each of these variable groups are accounted for in the present analysis but their necessity in the current measurement tool is not fully established, which creates a potential for redundant items.

5.1.4 Potential for redundant items

Previous research has shown that the combination of variables provides the best prediction ofoutcomes (Smith, et al., 2004), however, as mentioned in chapters 2 and 4, the contribution of each individual variable beyond that of other associated variables is less well understood and this issue is of particular relevance where predictive variance is concerned.

Judge and colleagues (Judge, et al., 2002), for example, suggest that locus of control, emotional stability, self-esteem, and generalised self-efficacy have an average correlation of .61 and found that a single factor explained 71% of the variance in these variables. Across two studies with a total of 1166 participants, Judge et al (2002) suggested that while each construct did have some unique variance, the measures were not independent enough to be considered as assessing entirely separate constructs, as each individual measure contributed no more than an average of 14% variance when controlling for the general factor. It should be noted, however, that the incremental variances explained by the individual traits were still often significant ($p < .01$), and that the pattern of significant results was not identical across different dependent variables. For example in depression, locus of control, emotional stability, and self-efficacy provided significant unique contributions to variance predicted ($p < .01$), while for happiness only self-efficacy predicted unique variance at the .01 level. This may suggest that while it is important to account for common variance among variables and to look at the relative contribution of a variable rather than the contribution in isolation, measurement of these separate elements may be relevant for applications where specificity is needed to identify, for example, the relevant causes of specific well-being outcomes. The conclusion from this study is that the research should account for the common variance between these variables and also identify whether the significance of each independent variable is worthy of it being added to the measurement of the well-being process, or if it is redundant alongside other variables.

The issue of potential overlap or redundancy is particularly relevant in the current research as previous applications of the DRIVE model have not included personality measures and therefore their contribution is not established. Furthermore, the results of Chapter 4 demonstrated that there may be some overlap between closely related measures such as demands and effort and therefore including both may be unnecessary, with implications for conclusions on the accuracy of single-item measures. Not finding independent effects in this stage would provide evidence that the single-item approach would need to be adapted to focus on fewer, more broadly defined relationships, rather than more intricate associations.

Judge et al (2002) argue that a key issue in research examining these variables is that they are rarely examined in unison, for example by controlling for neuroticism when testing the relationship between self-esteem and depression. This restricts conclusions that can be drawn about the relevant contribution of each variable because self-esteem and neuroticism are so well correlated that the relationship under investigation may already have been demonstrated in research focusing on neuroticism. Any research examining variables that are conceptually similar should therefore examine whether the significance of these variables is due to common variance between them, or if each variable is of unique significance. The current analysis will therefore establish this for the purpose of development of the well-being measures but also suggest whether single-item measures may be a future approach for validly accounting for other variables in research without impacting on survey length substantially.

5.1.5 Model and relation to above
As discussed in Chapter 2, multiple models exist that each aim to predict well-being outcomes in the workplace. The DCSQ and ERI models were described as some of the most frequently studied approaches, followed by the HSE Management Standards, which uses some of these variables while also including others such as consultation on change and role understanding. Finally, the DRIVE model was described as an example which builds upon these approaches by including individual differences in the form of coping style and attributional style. The development of single-item measures included others identified in the literature with personality-related variables being identified as especially important for SWB and representing a missing aspect of the DRIVE model. This simple application of the model predicts direct relationships between work characteristics (demands and resources), individual differences (coping style and attributional style), personality (broad personality traits and self-esteem, self-efficacy, and optimism) and outcomes (positive cognitive appraisal, negative cognitive appraisal, positive emotional, and negative emotional well-being).

The analysis in this chapter follows these levels of complexity to examine the predictive validity of single-item measures in comparison to multi-item measures on each of these levels and as a combined whole. Data were analysed to examine the overall predictive validity of the items using single- and multi-item measures, the predictive validity of each variable group beyond that

of the previously included groups, and the significance of the contributions of each individual variable in the model at the final stage of the regression where all variables are included. These analyses were performed for each outcome. The results of the analysis are presented in a format that shows direct comparison with multi-item measures of the same constructs, as well as the relative contribution of added variables, and finally the predictive validity of the combination of multiple variables using single-items compared to the predictive validity of fewer variables using multi-item measures.

Based on previous research, including that which demonstrates differences between well-being outcomes (Busseri, et al., 2007;Lucas, et al., 1996) , that which has examined well-being on similar groups using multi-item measures (Mark & Smith, 2012; Mark & Smith, 2012; Smith, et al., 2004), the following hypotheses are made:

1) The combination of all predictor variables will predict significant variance in each well-being outcome
2) The addition of each variable group (work characteristics, individual differences, personality) to the model will increase the variance predicted significantly
3) Each individual variable within each variable group will predict significant unique variance on well-being outcomes

Although it is expected that the degree of relationship for each predictor and each outcome will vary across outcomes, no specific hypothesis is made regarding which individual variables will be significant for which outcome due to lack of research examining these variables in combination. No specific hypothesis is made regarding the degree of difference between the single- and multi-item approaches due to lack of previous research comparing the two methods in this context.

5.2 Method

5.2.1 Participants, design, and procedure
This chapter presents continuation of analysis from the staff and nurses samples presented in the previous chapter. As such, participants and procedure remain the same.

5.2.2 Materials
Due to the fact that the nurses sample involved updated measures in order to improve validity issues presented in analysis of the staff sample, variables in the current analysis varied between staff and nurses analysis. Coping style in the staff sample was measured using a single item for positive coping and a single item for negative coping, while in the nurses sample single items

were used to represent problem focused, seeks social support, blame self, avoidance, and wishful thinking independently. The creation of outcome groups also varied across samples, with positive and negative cognitive appraisal comprising a single satisfaction and stress item respectively in the staff sample, while in the nurses sample positive cognitive appraisal comprised job satisfaction and life satisfaction and negative cognitive appraisal comprised job stress and life stress. Analyses are presented for staff and nurses samples separately for this reason.

5.2.3 Analysis procedure

New variables were created to be used as criterion in the regression models. These variables are defined as Positive Cognitive Appraisal (consisting of life satisfaction and job satisfaction), Negative Cognitive Appraisal (life stress and job stress), Positive Emotional Well-Being (positive affect), and Negative Emotional Well-Being (negative affect, depression, and anxiety). These variables were created simply by adding scores together on the individual variables and using the combined score to represent each criterion. Previous research has combined similar variables in similar ways, for example Smith et al (2009) created outcome groups that combined depression with anxiety, stress with dissatisfaction, and satisfaction with job enjoyment. Similarly, other studies presented in Smith et al (2009) combined HSE MS, ERI, and DCSQ measures into work characteristics and positive and negative affect with depression and anxiety into outcomes measures, also combining job satisfaction and stress measures along with satisfaction with various specific domains into a single group called appraisals. In the present research cognitive appraisal represents a corollary, however it is named in line with SWB theory also.

All analyses used the data after missing data, skewness, and kurtosis were improved.

<u>Univariate analysis</u>

The first stage in the analysis was to examine the correlations between the single-item predictor and outcome variables. The results from this stage were used as an initial indicator of the predictive validity of the measures and as a criteria for which variables would be entered into the regression model. Variables with non-significant correlations with outcome measures were not entered into the regression for that outcome in line with previous research, which has dropped non-significant predictors from analysis (Lee-Flynn, et al., 2011). Although it is acknowledged that this approach would lead to some variables reaching significance due to the number of comparisons, the intention of this stage of the analysis was to remove variables with the lowest likelihood of relevance in the regression model to reduce the likelihood of variables adding only error to the model and potentially suppressing other relationships, while being highly unlikely to be a significant predictor. At the same time the exploratory research approach to using a broad set of variables that could be narrowed down at later stages of the project meant that a liberal .05

significance criteria was used to represent significance so that only the weakest variables would be excluded solely on the basis of this correlation.

Variables which had no significant relationship with an outcome in either the staff or nurses samples were not put into the regression model for that outcome. Attributional style as measured by the single-item measures was not assessed at this stage, because the results from the previous chapter showed almost no indication that they were valid. However, the multi-item scores were included in the second stage in order to determine whether attributional style added significantly to prediction of the outcomes, therefore indicating the impact of not including attributional style on the prediction of well-being using single-item measures.

<u>Overall predictive validity</u>

The second stage of the analysis examined the model summary of the hierarchical regressions in terms of the r squared change at each step of the regression. The first step included demographic variables (where appropriate), the second step consisted of work characteristics and resources, the third step coping style, the fourth step personality, and, for the multi-item model, attributional style in the fifth step. This was used to determine whether the contribution of each set of variables is significant and therefore whether the multi-faceted approach is supported.

Because previous research has established the contribution of work characteristics, resources, and coping style to well-being in the workplace (e.g.Mark & Smith, 2012), these variables were entered in groups in that order, followed by personality. This provided an indicator of whether the contribution of personality-related variables contributes beyond the variables measured in previous research, as described above. Personality has also been referred to as a factor that is often ignored due to the number of items often required (Schimmack, et al., 2004) and therefore seems an appropriate choice to represent an 'additional' factor that can be accounted for by using single-item measures.

<u>Comparing breadth to depth of measurement</u>

The next step was to compare the total r squared from the final step of the single-item regressions to each individual step of regression when multi-item measures of the same variables were used. This analysis was used to determine the comparative benefit of using single-item measures to measure multiple factors in well-being prediction, against the benefit of the comprehensiveness which the multi-item approach provides with fewer variables.

<u>Determining independent contributions</u>

Finally, the last step of each regression was examined more closely to determine the standardised beta and significance of each individual single-item variable when all variables are entered into

the regression together. These results were compared between the staff and nurses samples to determine which variables were individually the most important single-items for well-being prediction and whether the single-item measures provide the fidelity required to identify unique variance explained by correlated, but independent, predictor variables.

5.3 Results

5.3.1 Univariate analysis

Demographic variables were not correlated with outcomes, with the exception of education and negative emotional well-being which were significantly correlated in the staff sample ($r = .189$, $p < .05$, $n = 117$). The majority of the predictor variables were significantly correlated with the well-being outcomes in at least one of the samples. The exceptions were: demands and bullying were not correlated with positive emotional well-being, emotional stability was not correlated with negative cognitive well-being, and conscientiousness, agreeableness and openness were not correlated with negative cognitive or negative emotional well-being. These variables were therefore not included in the regression models for their respective non-correlated outcome. Correlations were in general stronger in the nurses sample than the staff sample. Tables of the significant correlations can be found below.

Table 5.1: Significant univariate correlations between work characteristics and outcomes for single-item measures.

	Positive Cognitive		Negative Cognitive		Positive Emotional		Negative Emotional	
	Staff	Nurses	Staff	Nurses	Staff	Nurses	Staff	Nurses
Demands	-	-.270**	-	.569**	-	-	-	.243**
Control	-	.495**	-	-.447**	.210*	.292**	-.273**	-.214**
Support	-	.325**	-	-.195**	-	.319**	-	-.287**
Effort	-	-.383**	-	.593**	-	-.176*	.252**	.250**
Reward	.249**	.515**	-	-.300**	.270**	.356**	-	-.347**
Supervisor Relationship	-	.486**	-	-.329**	.188*	.289**	-	-.292**
Bullying	-	.211**	-	-.168*	-	-	.232*	-.239**
Role	-	-.233**	-.180*	.152*	-	-.187*	-.288**	.228**

	Positive Cognitive		Negative Cognitive		Positive Emotional		Negative Emotional	
	Staff	Nurses	Staff	Nurses	Staff	Nurses	Staff	Nurses
Change	-	-.353**	-	.284**	-	-.180*	-	.192*
N	120	178	120	179	117	179	117	179

Table 5.2: Significant univariate correlations between coping style and outcomes for single-item measures.

	Positive Cognitive		Negative Cognitive		Positive Emotional		Negative Emotional	
	Staff	Nurses	Staff	Nurses	Staff	Nurses	Staff	Nurses
Positive Coping	.380**		-.158	-	.421**	-	-.444**	
Problem Focused		.306**		-.217**		-.405**		-.344**
Seeks Social Support		-		-.224**		.276**		-.252**
Negative Coping	-.324**		.238**		-.378**		.423**	
Blame Self		-.271**		.176*		-.367**		.503**
Wishful Thinking		-.364**		.381**		-.283**		.407**
Avoidance		-.313**		.303**		-.343**		.434**
N	120	178	120	179	117	179	117	179

Table 5.3: Significant univariate correlations between personality variables and outcomes for single-item measures.

	Positive Cognitive		Negative Cognitive		Positive Emotional		Negative Emotional	
	Staff	Nurses	Staff	Nurses	Staff	Nurses	Staff	Nurses
Extraversion	-	.233[**]	-.181[*]	-.177[*]	.382[**]	.372[**]	-.382[**]	-.337[**]
Conscientiousness	.227[*]	-	-	-	.185[*]	-	-	-
Agreeableness	.228[*]	.161[*]	-	-	.272[**]	.213[**]	-	-
Emotional Stability	.387[**]	-	-	-	.409[**]	.256[**]	-.293[**]	-.212[**]
Openness	.215[*]	-	-	-	.218[*]	-	-	-
Self Esteem	.486[**]	.467[**]	-.211[*]	-.268[**]	.768[**]	.721[**]	-.700[**]	-.630[**]
Self Efficacy	.470[**]	.384[**]	-	-.255[**]	.577[**]	.636[**]	-.573[**]	-.504[**]
Optimism	.647[**]	.571[**]	-	-.349[**]	.779[**]	.724[**]	-.689[**]	-.701[**]
N	120	177	120	178	117	178	117	178

5.3.2 Multivariate predictive validity on each outcome

<u>Positive Cognitive Appraisal</u>

Figure 5.1 : Amount of positive cognitive variance predicted in university staff by single-item measures.[ab]
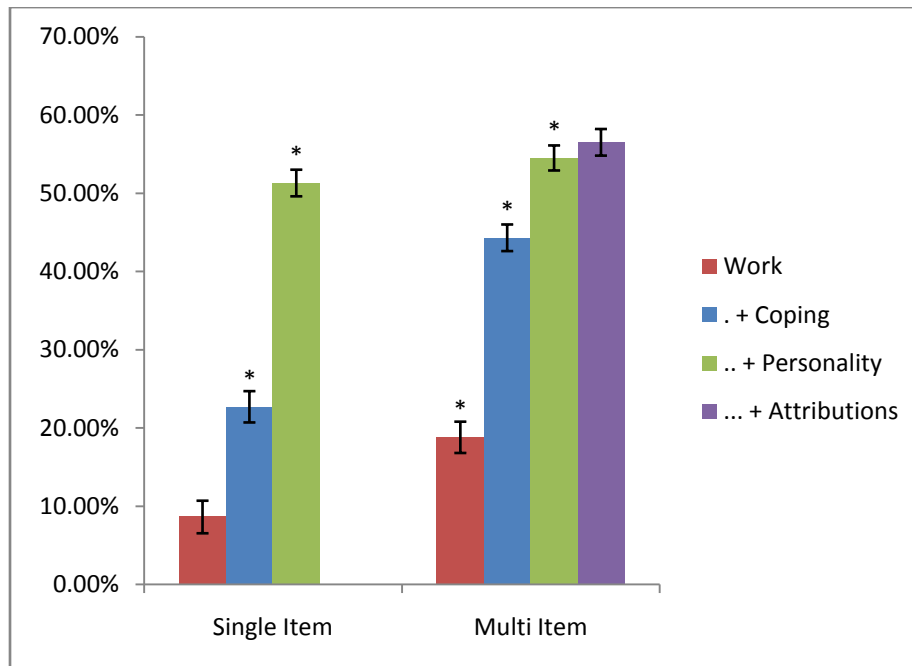
[a] Error bars show standard error of the estimate. [b] An asterisk represents a significant r-squared change.

Single-item work characteristics predicted a non-significant amount of variance in positive cognitive appraisal in staff ($R2 = .09$, n.s.) and a significant 10% more variance using the multi-item measures ($R2 = .19$, $p < .05$). The contribution of coping style was larger in the multi-item model but significant in both cases, at 23% for single-item measures and 44% for multi-item measures (single–item $r2 = .23$, F change = 9.13, $p < .001$, multi-item $r2 = .44$, F change = 10.16, $p < .001$). Single-item measures of work characteristics, coping style, and personality combined predicted 51% of the variance in the staff sample for positive cognitive appraisal ($r2 = .51$, F change = 6.86, $p < .001$), comparable to the 55% predicted using the multi-item measures ($r2 = .55$, F change = 2.29, $p < .001$). The addition of attributional style in the multi-item model did not add significantly to prediction of positive cognitive appraisal ($r2 = .57$, F change = .58, n.s.).

This overall prediction was also confirmed in the nurses sample where the combination predicted 59% of the variance, however in the nurses sample each stage predicted a significant amount of variance (work characteristics $r2 = .44$, $p < .001$, coping style $r2 = .51$, F change = 5.60, $p < .001$,

personality r2 = .59, F change = 3.84, p < .001). Figure 5.5 shows a summary of the nurses results.

Negative Cognitive Appraisal

Figure 5.2: Amount of negative cognitive variance predicted in university staff by single-item measures.[ab]
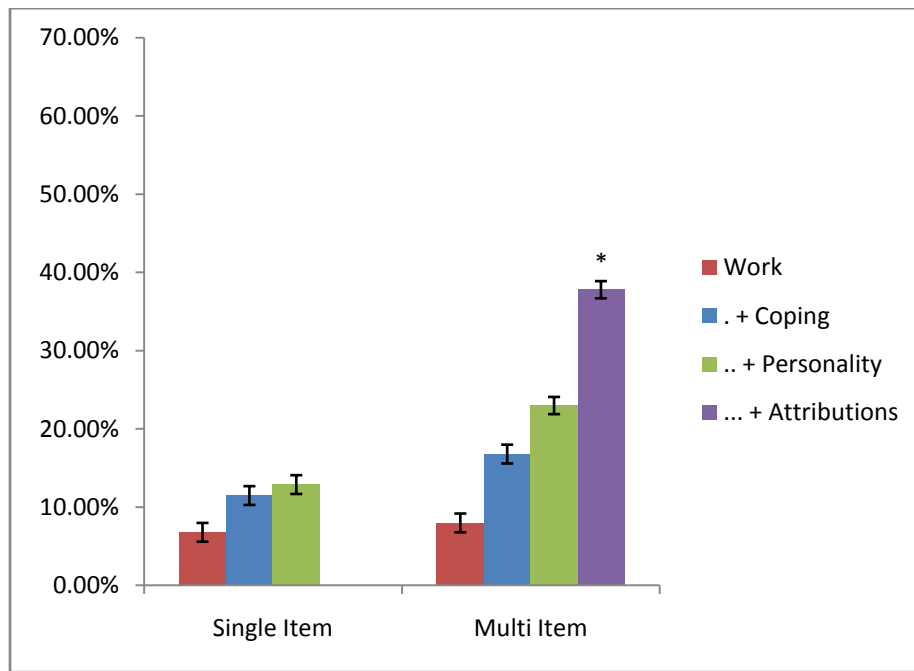
[a] Error bars show standard error of the estimate.   [b] An asterisk represents a significant r-squared change.

For negative cognitive appraisal, work characteristics predicted a non-significant amount of variance in staff well-being using the single or multi-item measures, predicting 7% of the variance using single-items and 8% using multi-items (single-item r2 = .07, n.s., multi-item r2 = .08, n.s.). Coping style did not contribute significantly in either case with the model predicting 12% using single-items (F change = 2.68, n.s.) and 17% using multi-items (F change = 1.86, n.s.). The inclusion of personality also did not increase prediction significantly (single-item F change = .40, n.s., multi-item F change = 1.69, n.s.), leading to a total of 13% variance predicted using single-item measures and 23% using multi-item measures.

 In the nurses sample however, work characteristics predicted a significant 50% of variance in negative cognitive appraisal (p < .001). Coping style contributed significantly (F change = 4.21,

p < .001) with the model predicting 56% of variance while personality however added only 1% to the model (r2 = .57, F change = .65, n.s.).

Positive Emotional Well-Being

Figure 5.3: Amount of positive emotional variance predicted in university staff by single-item measures.[ab]
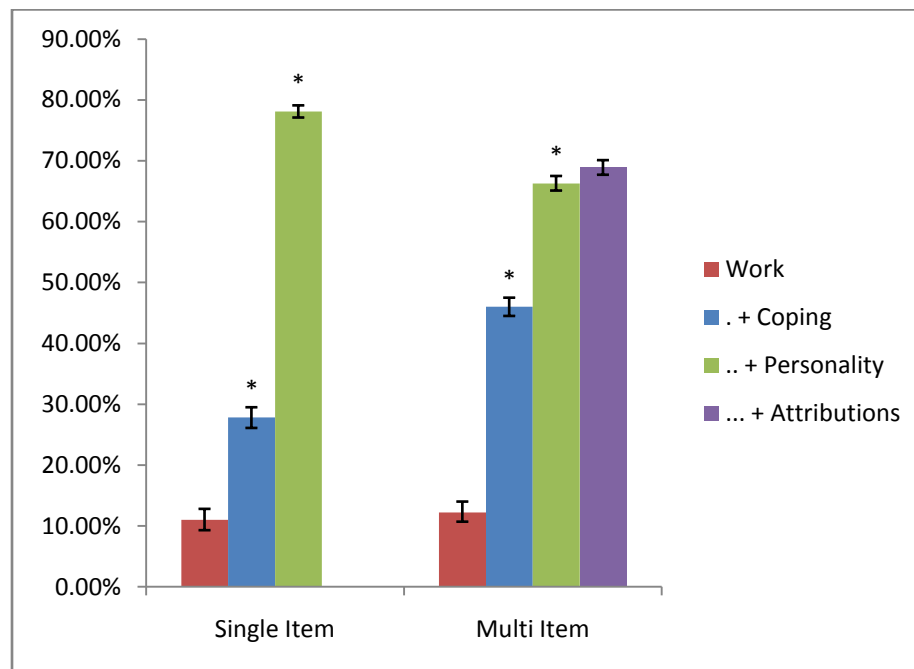
For positive emotional well-being, work characteristics predicted a non-significant 11% of variance using single-item measures and a non-significant 12% using multi-item measures. Coping style contributed significantly in both cases with the model predicting 28% using single-items (F change = 11.95, p < .001) and 46% using multi-items (F change = 11.28, p < .001). The inclusion of personality increased predicted variance significantly to 78% using single-item measures (F change = 27.35, p < .001) and 66% using multi-item measures (F change = 6.15, p < .001).

Work characteristics provided significant prediction of positive emotional well-being in nurses at 17% (p < .001), with coping style increasing this significantly to 37% (F change = 9.97, p < .001) and personality further to 70% (F change = 20.69, p < .001).

Negative Emotional Well-Being

Figure 5.4: Amount of negative emotional variance predicted in university staff by single-item measures.[ab]
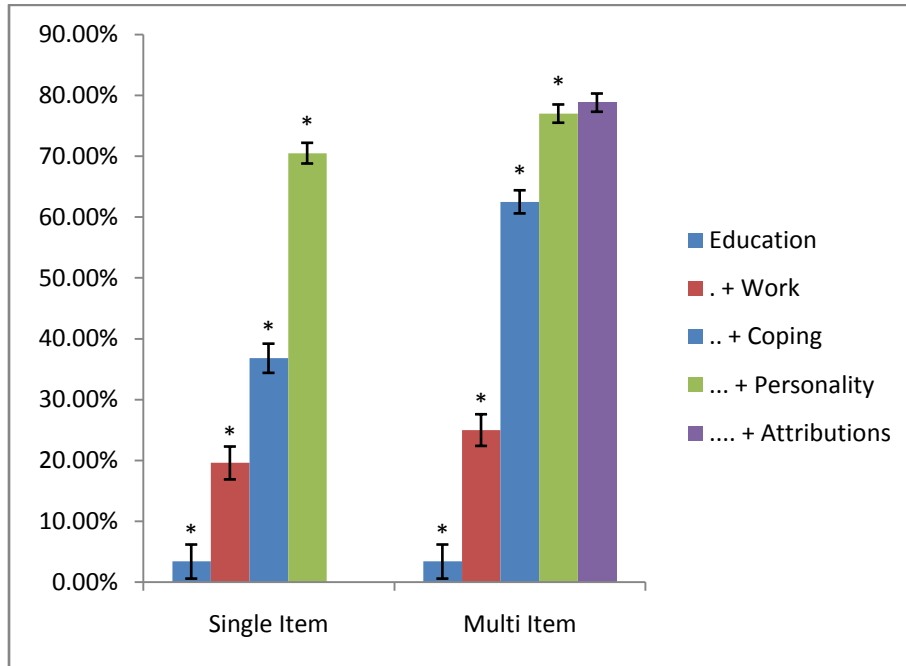
Education was significantly correlated with negative emotional well-being and predicted 3% of the variance (p = .049) in staff. The contribution of work characteristics to this was significant, with single-item measures improving prediction to 20% (F change = 2.27, p = .023) and multi-item measures to 25% (F change = 2.94, p = .004). The inclusion of coping style contributed significantly further using single and multi-item measures, increasing variance predicted to 37% (F change = 13.66, p < .001) and 63% (F change = 17.42, p < .001) respectively. Personality also provided a significant improvement to prediction in both cases, predicting 71% of the variance using single-items (F change = 21.68, p < .001) and 77% using multi-item measures (F change = 10.29, p < .001).

As with positive emotional well-being, findings for the nurses sample were similar to the staff sample. Although education did not predict a significant amount of variance in nurses (r2 = .01, p = .136), work characteristics predicted 20% variance (F change = 4.25, p < .001), increasing to 46% with the inclusion of coping style (F change = 15.13, p < .001) and 65% with the inclusion of personality (F change = 16.04, p < .001).

As can be seen by these figures, the majority of the difference in prediction between the single and multi-item measures can be attributed to coping style, while the overall prediction is similar throughout. Attributional style contributes little to the prediction of outcomes, with the exception of negative cognitive appraisal.

Prediction across outcomes in the nurses sample

Comparisons of the variance predicted by different variable groups to each outcome in nurses are shown in figure 5.5 below. Figure 5.5 illustrates the different contribution of variable groups across cognitive appraisal and emotional well-being outcomes, with work characteristics and coping style contributing more to the prediction of cognitive appraisal and personality to emotional well-being.

Figure 5.5: Variance of each outcome predicted by single-item measures in nurses. [ab]
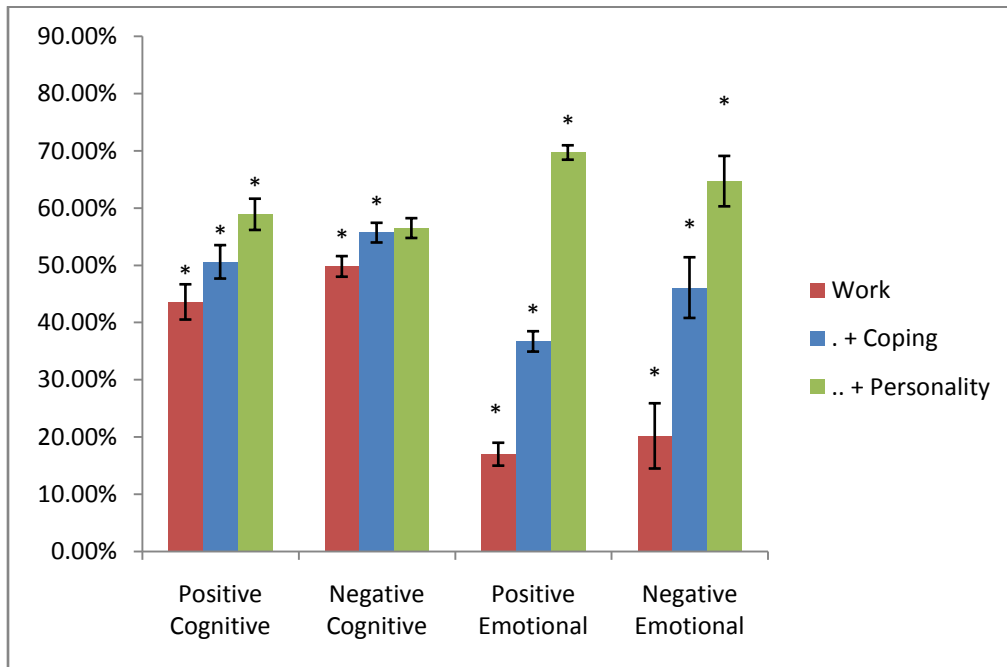
[a] Error bars show standard error of the estimate. [b] An asterisk represents a significant r-squared change.

5.3.3 Unique contributions of individual variables

In terms of the unique variance predicted by individual variables, emotional stability and optimism predicted significant unique variance in positive cognitive well-being and no individual variables predicted significant unique variance in negative cognitive well-being in the staff sample (see table 5.4 below). In the nurses sample, unique contributions across and within variable groups was demonstrated. Control, effort, reward, wishful thinking, and optimism each predicted unique variance in positive cognitive well-being and demands, control, and effort predicted unique variance in negative cognitive well-being. For positive emotional well-being, personality variables were more salient, with the unique contributions of self-esteem, self-efficacy, and optimism demonstrated in both the staff and nurses sample, with avoidance also contributing in the nurses sample. For negative emotional well-being, education, bullying, self-esteem, self-efficacy and optimism predicted unique variance in the staff sample, while in the nurses sample self blame, avoidance, self-esteem, and optimism predicted unique variance. Effect sizes for each of the individual variables are shown in table 5.4 below.

Table 5.4: Beta values for each individual single-item measure on each outcome at the final stage of the regression.

	Positive Cognitive		Negative Cognitive		Positive Emotional		Negative Emotional	
	Staff	Nurses	Staff	Nurses	Staff	Nurses	Staff	Nurses
Education	-	-	-	-			.142*	
Work Characteristics								
Demands	-	-	-	.295***	-	-	-	-
Control	-	.237***	-	-.224**	-	-	-	-
Support	-	-	-	-	-	-	-	-
Effort	-	-.168*	-	.268**	-	-	-	-
Reward	-	.200*	-	-	-	-	-	-
Supervisor relationship	-	-	-	-	-	-	-	-
Bullying	-	-	-	-	-	-	.179*	-
Role	-	-	-	-	-	-	-	-
Change	-	-	-	-	-	-	-	-
Coping Style								
Positive	-	-	-	-	-	-	-	-
Problem focused	-	-	-	-	-	-	-	-
Seeks social support	-	-	-	-	-	-	-	-

Negative	-	-	-	-	-	-	-	-
Blame self	-	-	-	-	-	-	-	.143*
Wishful thinking	-	-.189**	-	.238**	-	-	-	-
Avoidance	-	-	-	-	-	-.143*	-	.160*
Personality								
Extraversion	-	-	-	-	-	-	-	-
Conscientiousness	-	-	-	-	-	-	-	-
Agreeableness	-	-	-	-	-	-	-	-
Emotional Stability	.191*	-	-	-	-	-	-	-
Openness	-	-	-	-	-	-	-	-
Self Esteem	-	-	-	-	.428***	.338***	-.302**	-.168*
Self Efficacy	-	-	-	-	.147*	.243***	-.183*	-
Optimism	.489***	.269**	-	-	.383***	.355***	-.344***	-.408***

The above results are presented in figures 5.6 to 5.9 below in a way that provides a more practical use of the data in applied situations. The figures show mean scores on each outcome for those with low, medium, and high scores on the associated predictor variables. These scores were calculated by adding the significant positively associated variables and subtracting the significant negatively associated variables for each outcome then splitting the combined scores into tertiles.

Figure 5.6: Mean positive cognitive well-being score for those with low, medium, and high predictor variable scores.[c]
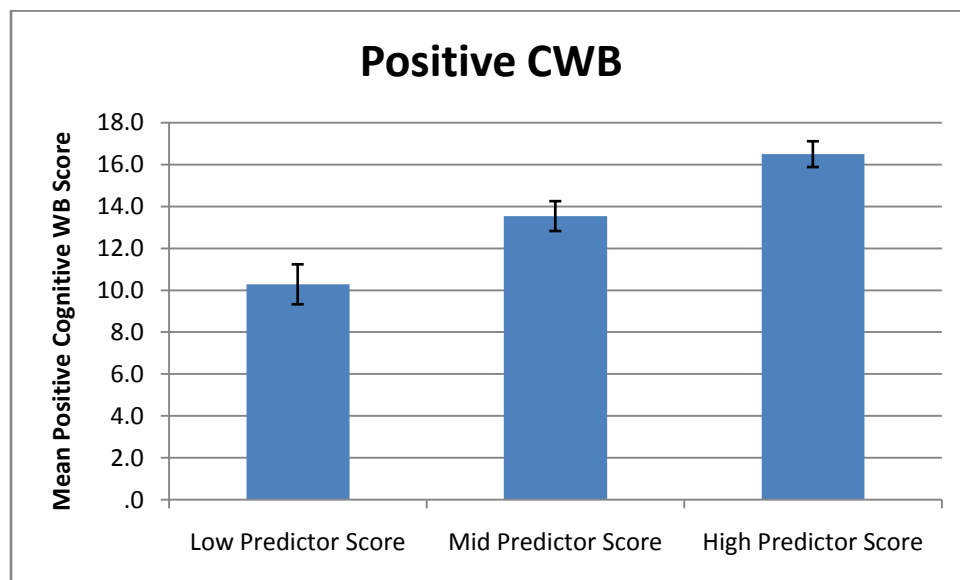
c
Error bars show 95% confidence intervals.

Figure 5.7: Mean negative cognitive well-being score for those with low, medium, and high predictor variable scores.[c]

Negative CWB

Figure 5.8: Mean positive emotional well-being score for those with low, medium, and high predictor variable scores. [c]

Positive EWB

137

Figure 5.9: Mean negative emotional well-being score for those with low, medium, and high predictor variable scores.[c]
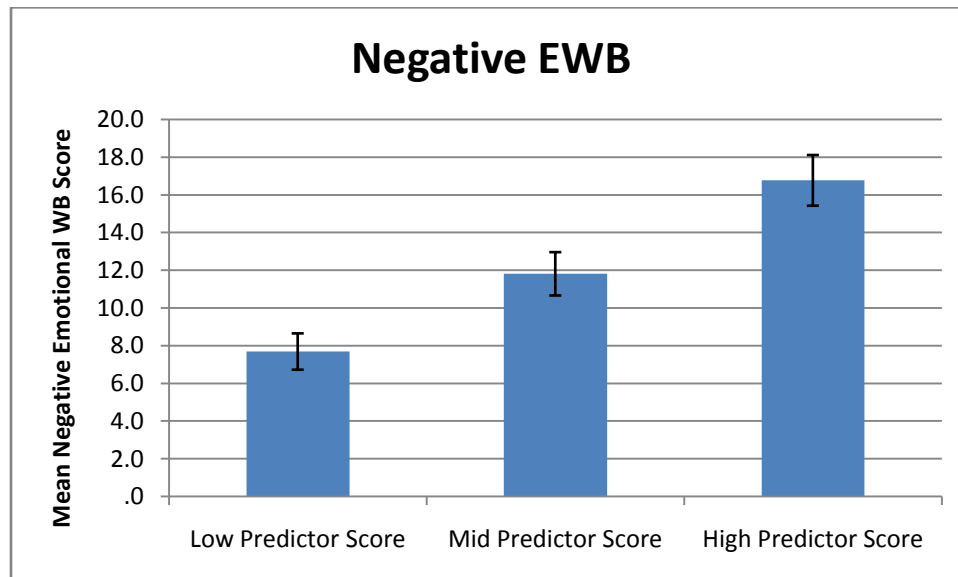
[c] Error bars show 95% confidence intervals.

5.4 Chapter 5 Discussion

The results demonstrate the ability for single-item measures to predict variance in well-being outcomes as a combined set of measures and as individual measures. Hypotheses were largely supported and in comparison to multi-item measures of the same variables, the reduction in the number of items required to measure the model was not matched by a significant reduction in the predictive utility of the measures. The results also provide an indicator of potential redundancy of some variables when considered alongside others.

5.4.1 Combined predictive validity

Overall predictive validity of single-item measures

In predicting well-being in university staff, the total variance predicted by the single-item measures was between 13% (stress) and 78% (positive emotional well-being), representing significant overall prediction for all outcomes but negative cognitive appraisal. In nurses,

between 57% (negative cognitive appraisal) and 70% (positive emotional well-being) of variance was predicted, representing a significant overall prediction for all outcomes. The difference in variance predicted between staff and nurses for the single-item measures is likely to be attributable to a more comprehensive measure of positive and negative cognitive well-being in the nurses sample, which includes both life and domain (job) satisfaction items.

This provides partial to full support for hypothesis 1 and suggests that the combination of single-item measures is a significant predictor of well-being.

Comparison to multi-item measures

Multi-item measures of the same constructs predicted between 23% (stress) and 77% (negative emotional well-being) compared to the 13% - 78% range of the single-item measures on equivalent outcomes. These results show that using single-item measures as an alternative to multi-item measures gives a reduction in variance predicted of 4% for life satisfaction, 6% for negative emotional well-being and 10% for stress. In positive emotional well-being, the single-item measures predicted 12% more variance than the multi-item measures. Overall this represents a net loss in variance predicted of 8% by using single-item measures, alongside a reduction in items of 176.

Validity of the multi-dimensional approach

The hypothesis that each variable group would contribute significantly to all outcomes was partially supported.

Using single-item measures in the staff sample, work characteristics alone contributed significantly to emotional negative well-being only. The addition of coping style and further addition of personality contributed significantly to the prediction of well-being in all outcomes but negative cognitive appraisals. This suggests that a multi-dimensional approach is particularly worthwhile using single-item measures as work characteristics alone may not be sufficient.

In the nurses sample, each variable group contributed significantly to the prediction of each outcome with the exception of personality to negative cognitive appraisals. A large part of the difference in results for work characteristics in cognitive appraisals is likely to be attributable to the more comprehensive measurement of these outcomes as, in the nurses study, the outcomes contain job stress and job satisfaction specific variables alongside life stress and life satisfaction. The results are therefore likely to represent the relevance of work characteristics to domain specific appraisals, suggesting that circumstances alone can contribute to well-being where they are relevant to the outcome being measured.

In the case of positive emotional well-being, the outcome variable remains equivalent but the significance of work characteristics alone is only found in nurses. The variance predicted by work characteristics alone is also however the lowest for positive emotional well-being in nurses at 17% (showing a similar pattern to the staff sample where it is lowest at 12%) and the difference in significance level is likely to be due to sample size. This suggests that measuring more than just work characteristics is also particularly important for well-being where emotional outcomes are considered.

The conclusions regarding the contribution of each variable group to well-being as a whole using single-item measures are therefore that predicting well-being on the basis of circumstances items alone would be insufficient, the addition of coping style items would significantly improve prediction of well-being, and the addition of personality would significantly improve prediction of well-being further. However, circumstances alone may predict well-being in terms of domain specific cognitive appraisals and, in this case, the addition of individual differences and personality is limited. The implication of this is that when well-being is considered as a combination of positive, negative, cognitive, and emotional aspects the prediction of well-being benefits from a multi-dimensional approach, but the specific contribution of each variable group to prediction is not generalisable across all aspects of well-being; the multi-dimensional approach is therefore supported. This issue is discussed further in 'Independence of outcomes' below.

Small effects have previously been shown for education in aspects of well-being including satisfaction (e.g Witter, Okun, Stock, & Haring, 1984) and Diener et al (Diener, Sandvik, Seidlitz, & Diener, 1993; E. Diener, et al., 1999) suggest that this may be related to occupational status and income, or by allowing those with higher education to make progress or adapt to changes. As the results suggest, education may therefore be more relevant in university staff, where the study was open to all levels of staff, and therefore the effect of education on occupational status or income may be more prevalent in the sample compared to the nurses study, where occupational status and income were more homogenous due to the focus on nurses. However demographic variables added little to the prediction of outcomes overall, and although it is possible that this may be due to limitations of sample size, the relatively limited contribution of demographic variables to well-being has been established previously (Diener, et al., 1999; Lee-Flynn, et al., 2011).

Comparison to multi-item measures

The above results were mirrored in the multi-item measures, although in each case the variance predicted by work characteristics and work characteristics plus coping style was higher. Some of these differences in single- and multi-item approach was likely due to the inferior single-item

coping measures as demonstrated in Chapter 4, as the variance predicted was larger in the nurses sample using better designed measures.

The results therefore further support the finding that multi-item measures were generally better performing that single-item measures, although it is noteworthy that in the total model the differences between single-item and multi-item measures are reduced. This may suggest that differences in the variance predicted attributable to the superior coping measures in the multi-item model are accounted for by the personality measures in the single-item model, perhaps by representing the relationship between personality and coping style (Carver, et al., 1989).

Attributional style in the multi-item measure model did not contribute significantly to prediction of outcomes except in the case of negative cognitive appraisal, where predicted variance was lowest before the inclusion of attributional style items. This suggests that attributional style measured appropriately may predict variance in well-being but that this variance is also accounted for by other individual differences and personality variables. Therefore, the impact of not including attributional style on the single-item approach is not substantial for well-being as a whole, but may be relevant in certain circumstances.

In summary, the results from the multi-item measures further support the conclusions above regarding the contribution of the multi-dimensional approach, but do not indicate a substantial overall benefit of multi-item measures in terms of predicted variance in outcomes.

Single-item breadth vs multi-item depth

Another important aspect of these results regarding the single item measures is the total combined variance predicted in outcomes using single-item measures compared to the variance predicted using fewer variables measured more comprehensively using multiple items. One practical benefit and rationale for the single-item approach is that multiple variables can be measured using single-items in the same space as a single variable using multi-item measures. Contrasting the two approaches in this study shows that using single-item measures to measure work characteristics, coping style, and personality predicts greater variance in well-being than using multi-item measures of work characteristics alone, or work characteristics plus coping style. The implications of this result are further emphasised when considering that these combined variables using single-item measures are also measured with fewer overall items than work characteristics alone using multi-item measures.

The results therefore demonstrate that the ability to measure multiple predictor variables using single-item measures in a smaller space has a clear benefit to well-being prediction compared to measuring fewer variables with longer measures.

Independence of outcomes

The nurses sample results demonstrate succinctly the importance of specific outcome in the contribution of predictor variables. For positive and negative emotional well-being, work characteristics, coping, and personality provide distinct contributions to variance predicted, in line with the results from staff. Positive and negative cognitive appraisal outcomes differ in the nurses sample in that these now contain measures specific to life stress, job stress, life satisfaction, and job satisfaction, whereas in the staff sample a single more generic measure of stress is used and life satisfaction alone makes up positive cognitive well-being.

This difference in the way that these outcomes are measured results in a difference in the contribution of predictor variables where, in contrast to emotional well-being results, the vast majority of variance in cognitive appraisals is predicted by demands and resources. Meanwhile coping adds a significant but small amount to variance predicted in positive and negative cognitive outcomes while personality contributes significantly to positive but not negative cognitive outcomes.

Although it may be concluded in the nurses sample that circumstances have left little for other variables to contribute, the contribution beyond circumstances to cognitive appraisal in both samples is smaller compared to emotional well-being, particularly in the case of personality. The results therefore demonstrate that circumstances are of greater importance for cognitive appraisals and personality and individual differences are more important for emotional well-being.

The difference between the staff and nurses samples suggests a caveat that the influence of circumstances on cognitive appraisals depends on the inclusion of both life and work-related stress and satisfaction judgments, representing domain and general cognitive appraisals. This is in line with previous suggestions that domain and life satisfaction are independent (Larsen, et al., 1985). Depression, anxiety, positive and negative mood however demonstrate a greater relationship with individual differences and personality in each sample, supporting the conclusion that circumstances are more important for cognitive outcomes than emotional.

The multi-dimensional approach is therefore supported, with considerations to be made for cognitive and emotional well-being distinctions as well as domain specific demands and resources. The single-item measures distinguish broadly between these elements of well-being prediction and their associations with outcomes, comparing well to that of multi-item measures, particularly when considering the difference in number of questions required.

Summary of combined predictive validity

The results show significant prediction of well-being outcomes from the combination of items and significant independent contributions of each variable group. These results of single-item measures were comparable to that of multi-item measures and demonstrate that the items when combined are valid as predictors of multiple aspects of well-being and, further, that the multi-dimensional approach using single-item measures is justified when items are combined.

5.4.2 Unique contributions of individual variables

The remainder of the analysis was concerned with whether the individual items that represented the predictor variables demonstrated unique contributions to prediction or whether the variable groups essentially contained multiple predictors of the same variance in outcomes.

Distinctions between closely associated variables

The data were analysed in terms of the individual contribution of variables when all variables were entered in the final stage of the model. This was designed to determine if individual variables measured using single-item measures had the precision to detect independent effects of associated predictor variables. The results from Chapter 4 had suggested that this may not be the case, particularly within work characteristics and personality variable groups, and previous research has also highlighted the issue of overlap in well-being related variables (Judge, et al., 2002).

These results however present evidence that the single-item measures are capable of discriminating the independent contribution of variables within variable groups. The first such distinctions are in regards to work characteristics, where demands and effort show significant independent contributions to stress, and control and reward provide independent significant contributions to satisfaction. In terms of personality, the distinctive contributions of the closely associated variables optimism, self efficacy, and self esteem are also identified.

These results demonstrate that variables that appeared to be overlapping in results from Chapter 4 contributed significant unique variance in the prediction of well-being outcomes and therefore that the items are worthwhile alongside each other as valid measures of the individual constructs.

<u>Individual contributions across outcomes</u>

The prediction of well-being outcomes by combined variables demonstrated independent contributions of variable groups to different outcomes and this stage of the analysis suggested a similar finding for individual items in terms of their degree of relationship with different outcomes.

Rather than demonstrating a complete distinction between outcomes in terms of the variables that predict them, the results rather show that it is the relative contribution of each predictor group that varies across outcomes. Work characteristics were more consistently associated with cognitive appraisals while emotional well-being was only associated with bullying. At the same time, emotional well-being outcomes were consistently associated with personality variables while optimism was also associated with positive cognitive appraisals in staff and nurses. In the case of coping style, wishful thinking was associated with cognitive appraisals, while self blame and avoidance was associated with emotional well-being. The results therefore suggest that while distinctions may be useful in a broad sense for the variables most associated with different aspects of well-being, it is also possible that some circumstances, such as bullying, may have emotional implications, while aspects of personality, such as optimism, may also affect cognitive appraisals, and different aspects of coping may serve to relieve different types of distress.

While these differences may be due to issues with measurement or multiple analyses, when the specific variables involved in these unique relationships are considered the results do appear logical. Of the work characteristics, bullying stands out as a variable that is more associated with personal distress than other variables, such as demands and control, which are more clearly aspects of the workplace. In the case of personality, optimism may contain a cognitive element which represents its unique variance separate from personality (Kluemper, et al., 2009) which would explain its association with cognitive outcomes as well as emotional. Wishful thinking may also represent a coping behaviour associated with thought patterns and therefore be associated with cognitive outcomes. Whether or not these explanations are correct however, what can be concluded is that, in terms of the individual contribution of variables, the single-item measures demonstrate unique associations between well-being outcomes and predictors that suggest they are suitable for a multi-dimensional approach, in the sense that they appear to be distinguishing between these closely associated constructs. Further research to more fully understand the nature of these differences in relationships should therefore follow.

It should be noted however that, due to the practical limitations of the study, the independent contributions were only assessed more broadly across cognitive, emotional, positive, and negative outcomes. The results however do not identify potential differences in relationships within these outcome groups, for example, some relationships with predictors may exist for depression that do not exist for anxiety or negative mood. The difference between staff and nurses results for the relationship between cognitive outcomes and circumstances provides some

indication of this, where a different set of items within the outcome groups provides a different result. In contrast, the same relationships may potentially exist for each or some of the outcomes within the outcome groups and the use of all of them may be redundant. The present study presents a broad distinction between types of variables that future research can build upon to examine more closely the relevance of predictor variables to specific outcomes.

Previous research has, however, combined outcomes in a similar way, for example Smith et al (2009) also included negative mood, anxiety, and depression together in a negative mental well-being group and an appraisals group consisting of satisfaction that is consistent with the cognitive well-being group created here in line with SWB theory. Unfortunately, the broad approach used in the present research in order to establish whether single-item measures were suitable for multiple dimensions does not allow for closer inspection of relationships in each individual outcome due to the number of comparisons required. Further research however could examine each individual outcome more closely to establish the necessity of each individual element, with the current results as a basis for expecting that if distinctions do exist, they should be identifiable with single-item measures.

Distinctions between positive and negative variables

Previous research has suggested that the presence of positive factors is not the same as the absence of negative factors (Smith, et al., 2009). Furthermore the DRIVE model distinguishes between demands and resources within work characteristics. This therefore represents another distinction between variables that the single-item measures can be expected to demonstrate in order to support their use in a multi-dimensional approach.

The results of the individual contribution of predictor variables to outcomes do indicate these distinctions in terms of the specific causes likely for each. This is also somewhat the case in these data, where demands contribute to stress but not to satisfaction, suggesting that the absence of demands does not lead to satisfaction but the presence does contribute to stress. This may also apply to factors such as bullying, however reward does appear to influence both positive and negative outcomes. The simple nature of the measurement approach does not allow more complex influences such as whether the change in demands matters more than the level of demands at the time. An alternative explanation is that demands in these samples did not reach a low or high enough level to influence satisfaction. These types of questions could, however, be the focus future research with the current research as a basis to expect the single-item measures to be valid measures of such variables.

Differences in positive and negative variables in terms of their relationships with outcomes has been suggested previously, for example Smith et al (2009) found strong relationships between

negative job characteristics and negative outcomes and positive job characteristics and positive outcomes.

Taking this into account with the present results, the single-item measures may also be used in this way if, in practice, an application was desired which would distinguish between the presence of negative well-being issues and the absence of positive well-being issues. However this would also have to account for the different variables that would make up the positive and negative scores depending on outcome or risk the inclusion of redundant variables.

An alternative practical approach is to use the significant variables highlighted in the regression to create a predictor score that can be associated with different levels of the appropriate well-being aspect. An example of this use is shown in figures 5.6 to 5.9. These figures demonstrate that those with medium or high predictor scores have a higher average outcome score and thus a target in practice may be to develop those in the lower groups into the higher groups to improve well-being. These figures are also useful in that they show that while the individual effect sizes of the variables associated with each outcome are often small, when combined these scores have an influence on the mean outcome score. For example in the case of positive emotional well-being we can see that moving predictor group from low to high can mean the difference between a positive mood score of 4.5 and 8.4, which translates to a difference between the low positive mood group (below the median) to the high positive mood group (above the median).

Other pathways not accounted for

One pathway added to the enhanced DRIVE model is that between stress and other well-being outcomes. Previous research using the model has suggested that stress appraisals exist as a precursor to well-being in a mediator relationship between demands and outcomes (Mark &Smith, 2012). Although this may be a relevant pathway in theoretical models of well-being, there are two aspects of this pathway that result in its direct measurement being unnecessary in the context of practical measurement.

The first aspect relates to the first step of the mediating pathway, between demands (or other variables) and stress. Stress is considered to be a significant element of well-being, to the extent that it is referred to specifically as a significant aspect of well-being definitions and assessment (Black, 2008; HSE, 2013; Kerr, et al., 2009) and it is important therefore to directly measure stress and factors which may influence it. Doing so in the current study with stress as an outcome accounts for this emphasis on stress in well-being and identifying the predictors of stress as an outcome accounts for the initial stage of the of the mediation between predictors and stress.

The second aspect relates to the latter part of the mediating pathway, between stress and other well-being outcomes such as depression. Although this may represent a significant pathway in terms of predicting other well-being outcomes, in the current context of a practical applied measure this pathway is less relevant as stress itself is not an actionable predictor. In order to

improve other well-being outcomes by improving stress the relevant predictors of stress would also have to be identified; this is accounted for by considering stress as an outcome, as described above.

Taking these aspects into account in the context of a measure intended for practical application, we can see that any partial or full mediation of a predictor variable on other outcomes by stress is accounted for by considering stress as a well-being outcome in itself. It can therefore be concluded that while the mediating pathway is not directly measured, it will be accounted for in practice with efforts to improve stress as an outcome having potential carry-over effects onto other aspects of well-being alongside the effects of the directly associated predictor variables identified in the research. With the aspects of well-being being correlated, the same may also be the case to some degree across each of the outcomes and this is in line with well-being existing as a concept that consists of multiple associated but unique aspects (Wismar, et al., 2013).

For the current goals of the research in developing a practical measure therefore, this mediating pathway is not explicitly assessed. However, future research into this and other interactive relationships between the significant variables identified here would be beneficial to the development of the multi-dimensional well-being theory.

Potentially redundant predictors

Many of the variables included in the regression did not provide significant unique contribution to the model in any aspect of well-being. This is relevant to advice on well-being measure development such as that from the WHO (Wismar, et al., 2013), which states that the number of indicators should be kept to a minimum and that there may be some overlap.

One potential explanation of this is that the single-item measures do not distinguish between the contributions of individual variables, however, considering the unique contributions that have been demonstrated by the single-item measures, this explanation is unlikely. Firstly, the variables for which significant unique contributions have been demonstrated are for those suggested in Chapter 4 to be the ones most likely for overlap (e.g. demands and effort, optimism and self-esteem). At the same time, some of the variables not shown to have significant contributions (e.g. supervisor relationship) had the highest validity and reliability results in Chapter 4, suggesting a limited likelihood that they do not measure the construct specifically.

Taking these facts together suggests that the non significant contributions of other variables not so closely correlated are likely due to redundancy in terms of predictive variance rather than an issue with the precision of the single-item measures. Therefore the results suggest redundancy in some of the items where all outcomes are concerned, including support, supervisor relationship, role understanding, consultation on change, extraversion, conscientiousness, agreeableness and

openness. Problem focused and seeks social support coping styles are also apparently redundant but for these variables problems with the validity of the measures cannot be ruled out based on the results of Chapter 4.

While the conclusions regarding the relevance of these variables to well-being are limited by the methodology of this study (discussed further at the end of this section), what can be concluded is that relative contribution to well-being prediction is greater for some variables than others. This conclusion has implications for the development of a practical well-being tool, where priority can be given to variables that show the strongest associations in order to reduce the number of items required.

Even without significant unique contributions from many of the items included, the results discussed so far demonstrate that single-item measures can be used to predict well-being outcomes in terms of the contribution of multiple variable groups and individual variables within those groups.

5.4.3 Implications for current measurement approaches

These conclusions can be linked to the various models described in Chapter 2 that cover different levels of multidimensionality in well-being assessment. In the results described above, work characteristics represent the most commonly used models of well-being prediction in the workplace in that this variable group consists of the variables that make up the JDCS, ERI, and HSE MS approaches to well-being prediction. Linking these approaches to the discussion of the results above, it can be seen that in the staff sample these approaches would be largely insufficient to predict well-being in comparison to a more multidimensional approach, where even when they do predict significant variance in outcomes (up to 20% for single-item measures and 25% for multi-item measures), they leave room for further variable groups to add significantly to prediction. With the exception of negative cognitive appraisals, where no combination of single-item measures predict significant variance, this is the case even when single-item measures are used to assess multiple dimensions compared to when more items overall are used to measure the combination of the JDCS, ERI, and HSE MS approaches.

A large part of the consistent lack of efficacy from these variables in the staff sample may however be related to the lack of domain specific cognitive appraisals in this sample and this is evidenced in the results of the nurses group. In the nurses results, the impact and importance of the JDCS, ERI, and HSE approaches can be more easily identified in the form of their significance to the prediction of cognitive appraisals that include domain stress and satisfaction. Where these outcomes are concerned it can be seen that the simple work characteristics models significantly predict domain specific cognitive appraisals and therefore these models are evidently useful for prediction of well-being in this sense, with further dimensions of predictor variables adding only between 15% and 17% to the overall model. When taking other aspects of well-being into account however, we can see from the nurses sample results that for positive and

negative emotional well-being the results are similar to the staff sample in that the simple work characteristics models alone leave 45% to 53% variance to be predicted by further dimensions.

In terms of the DRIVE model, the inclusion of coping style to work characteristics demonstrates that, in almost every case, this added dimension, referred to in the model as individual differences, adds significantly to prediction and overall leads to between 33% and 55% of the variance in well-being outcomes predicted in the nurses sample where outcomes are more fully represented. This contribution is significantly beyond that of the work characteristics alone in each outcome group, representing the benefit of this variable group in the DRIVE model, although, as indicated by the significant relevance of the work characteristics elements to cognitive appraisals, the contribution of coping style is less so for these outcomes.

It was suggested in Chapter 3, based on SWB research, that personality variables may contribute significantly to the DRIVE model. This was shown to be the case in all outcomes for nurses except negative cognitive appraisals. Personality added just over 8% to the prediction of positive cognitive appraisals but 33% to positive emotional well-being and 19% to negative emotional well-being, suggesting that the inclusion of this dimension presents a significant addition to the DRIVE model, particularly in the case of emotional well-being outcomes. The results show that much of this contribution is attributable to self-esteem, self-efficacy, and optimism, some of which were mentioned as possible additions to the model (Mark & Smith, 2008) and the results suggest that this would be beneficial.

In summary, in terms of the approaches already taken to well-being management described in Chapter 3, the results indicate that, individually, they can each contribute significantly to well-being, with the degree of that contribution depending on how well-being is assessed. Much of the contribution of the simpler models is related to cognitive appraisals, particularly domain specific appraisals and in this case further addition of individual differences and personality is limited. However the opposite is the case for emotional well-being outcomes including depression, anxiety, positive and negative mood. Overall, it can be seen that where the recommended multi-dimensional approach is taken to well-being definition, a multi-dimensional approach is also needed to predict these outcomes. The benefit of single-items in this sense is that it allows such an approach to be implemented with little impact on complexity or length of assessment while still demonstrating the benefits of a multi-dimensional approach in terms of predictive validity.

5.5 Conclusions

In summary, the results therefore demonstrate that single-item measures provide scores suitable to identify the broad and fine relationships between predictor variables and outcomes that a multi-dimensional approach to well-being assessment would require and that this approach should be able to identify areas of concern or targets for intervention in practice.

The total prediction of well-being outcomes using the single-item measures was significant and similar to that of multi-item measures, suggesting that, in terms of predictive validity, the single-item approach was overall suitable.

The contribution of each variable group showed that prediction of well-being benefits from the inclusion of coping style and personality variables, supporting the multi-dimensional approach. The fact that the relative contribution of each predictor group varied across outcomes also supported the multi-dimensional approach to well-being assessment as relationships could not be generalized across all outcomes, although this distinction was mainly applicable to cognitive and emotional rather than positive and negative groups.

The unique contribution of individual variables provided further support for the multi-dimensional approach and the performance of the single-item measures by showing that unique contributions of variables could be identified using single-item measures, even in those items that were most closely associated in the results of Chapter 4. Some variables, however, were shown to be less important and potentially redundant alongside other items. The results also provided some evidence for distinctions between positive and negative outcomes and predictor variables.

In summary, a multi-dimensional approach using single-item measures was supported, however the number of variables involved may be open to reduction to improve practicality further.

5.5.1 Culmination of findings: Single-item well-being measures
The previous chapters contain a lot of information on a number of variables and their performance on a range of criteria. The result of this research is a set of measures that can be used to easily score, assess, and compare well-being and associated factors with limited time commitment. These are summarised below:

Well-being outcome measures

Depression	Positive Mood	Life Satisfaction	Life Stress
Anxiety	Negative Mood	Job satisfaction	Job Stress

These items represent multiple dimensions of psychological well-being. Depression and anxiety represent negative mental health issues monitored as important factors in national health and economic performance (see Chapter 2) and were shown to distinguish well between those who would and would not receive a diagnosis using the HADS scale.

Positive and negative mood items represent the SWB elements of positive and negative emotional well-being and were found to correlate strongly with their respective multi-item measures in the I-PANAS-SF.

The stress and satisfaction items represent both the domain and general cognitive appraisal aspects of SWB. The individual stress and satisfaction items appeared to be measuring independent aspects of cognitive well-being and demonstrated the importance of domain specific circumstances in the appraisal of stress and satisfaction.

The independence of these outcome measures was demonstrated as an important aspect of identifying the impact of circumstances and individual differences on different aspects of well-being, however the importance of each item when used alongside each other requires further research.

Measures of variables with unique contributions to the prediction of outcomes

Demands	Wishful thinking	Emotional stability
Effort	Avoidance	Optimism
Control	Self blame	Self esteem
Reward		Self efficacy
Bullying		

These items were shown to contribute significantly to the prediction of one or more aspect of well-being. They represent work characteristics both positive and negative, negative coping styles, and personality characteristics. The evidence for these items as predictive of well-being outcomes suggests that the single-item approach can be used to assess well-being from a process approach that accounts for circumstances, coping style, and personality and their relationships with well-being.

Their independent associations with well-being were demonstrated providing support for the single-item measures, however, since these associations were based on significance of relationships in two working adult groups, future research should establish whether these variables are consistently relevant, whether some weaker associations reached significance due to the number of comparisons, or whether different variables may be important for other groups.

Measures of other variables not currently shown to have unique contributions

Supervisor relationship	Problem-focused coping	Extraversion
Support	Seeks social support	Agreeableness
Role understanding		Conscientiousness
Consultation on change		Openness

These items represent single-item measures of other variables that have previously been associated with well-being but were not found to contribute as strongly to outcomes. The results suggested that these variables may not be as relevant in a practical measure of well-being, however further research is necessary to determine their relevance in a multi-dimensional well-being model in different populations.

The results for many of the items in this list suggested that they are valid indicators of their respective constructs, particularly in the case of supervisor relationship and big 5 personality factors. Their use in further research or practical applications where these variables may be relevant is therefore encouraged. Other items, particularly the coping items, also did not have encouraging results in terms of validity of the measures and therefore the results overall suggest that further development of more practical measures of these coping styles is necessary.

The following chapter discusses how these measures may be applied in practice in the form of a Well-being Process Questionnaire.

5.6 Limitations

The limitations already discussed in Chapter 4 also have implications for the results of this chapter. Firstly, the sample size influences the significance of the correlations where non-significant results in these samples would be significant in samples of larger size. As stated in Chapter 4, this therefore means that the results represent the strongest predictors rather than the complete range of predictors. Further research would however benefit from larger samples to examine weaker contributions.

This also links to the lack of diversity in the sample in that potentially the variables that have strongest relationships in these working adults may differ to those working in a very different environment or in a different culture (Diener, et al., 1998). Unfortunately the different measures used for satisfaction and stress prevent conclusions on whether different work characteristics have different influences on well-being in different groups. The relevance of the results in terms of the use of single-item measures as predictor variables remains however and provides a basis for future research to identify the best combination of measures for situations which may different, with the evidence providing confidence that multiple variables can be assessed without a tremendous burden on the length of the questionnaire. Potential alternative variables can therefore initially be added alongside each other using the single-item approach where alternative variables are hypothesised and can be identified, with the present results suggesting that the unique contribution of even closely associated variables can be identified using single-item measures.

The research is also limited in that interactions are not included in the model. Although this is in order to maintain practicality in terms of simplicity in interpretation, as well as measurement, the results also indicate that interactions may add little to the prediction of outcomes, except potentially in the case of life satisfaction where it is possible that, rather than the proposed lack of life domain specific variables causing the lack of predicted variance, it is instead the lack of interactions in the model. Previous research however has shown that, although interactions may be significant predictors, their contributions are generally weaker and less consistent (Mark & Smith, 2008;Van Der Doef & Maes, 1999)

Although interactive effects are not discussed as indicators of the validity and reliability of measures (Cronbach, 1990; Nunnally, 1978), the research on single-item measures may nevertheless benefit from evidence that interactions can be demonstrated. Unfortunately, the limited sample size also means that interactions in the current sample may not be found if they are weak and further tests for this would only add to the already substantial analyses of a relatively small sample. This, combined with the desire to keep the measure simple for practical purposes, means therefore that interactions were not assessed but may warrant investigation in future studies.

As also mentioned in the limitations of Chapter 4, the research took a broad approach to the number of variables in order to work down to the items most relevant for a brief, practical approach. In the current chapter this approach also allowed us to identify overlap and redundancy in the contribution of variables, as proposed by previous research on coping, circumstances, and personality (Judge, et al., 2002;Diener, et al., 2003;Diener, 1996). The side effect of this however was a large number of comparisons and therefore risk of type 1 error, meaning that some effects are likely to have reached significance by chance alone. Replication of the findings in the nurses sample is intended to acknowledge this. For example, in the case of correlations, decisions were made based on the results from both the nurses and staff studies to account for this fact. However research using the aforementioned in-depth approach (see Chapter 4 limitations) would benefit understanding of the true relationships involved and would also be more important if future applications of the measures were to assess relationships not previously demonstrated.

Chapter 6 – Practical Application

6.1 Introduction

The results of the previous chapters have provided evidence of the ability for single-item measures to provide reasonably valid and reliable measures of well-being related constructs and for the combination of predictor measures to predict variance in well-being outcomes. The result was a set of measures that could be combined together to potentially provide a multi-dimensional measure of well-being and factors that could be contributing to well-being outcomes, however the exact nature of how these would be implemented in practice has not been directly established.

The current chapter is therefore dedicated to summarising how these findings can be translated into practical measurement in the context of a small Welsh social enterprise that provides online and telephone based support.

Connect Assist provide 24 hour helplines and online services to the users of multiple charities and other third sector organisations such as the Teacher Support Network, Bipolar UK, and Grocery Aid, who each provide support for their registered users. Connect Assist also provide the NHS Plus Health for Work Advice line which provides support for small businesses with issues relating to occupational ill health.

Connect Assist's major services are the 24 hour helpline and online support. These services are tailored to the client, but include helplines and online resources related to well-being. Many of the clients have issues relating to psychological well-being, for example work-related stress, and the online resources provide well-being assessment tools, such as the 'wheel of well-being', which assesses areas of well-being such as work and finances (for example, 'I'm worried about paying my bills each month and I'm starting to get into debt'). The funding for the research presented in this thesis was provided by a Knowledge Economy Skills Scholarship, and involves working with Connect Assist to develop a well-being tool that they can use in their services.

Connect Assist provide an example of a small to medium enterprise where well-being assessment is a goal, but resources are limited and the nature of the service means that practicality is of utmost importance. The findings from the research were used to develop a well-being measure to meet their needs, providing an opportunity to examine whether the findings can translate into practical use.

The research translated into a 4 stage development of the well-being tool, which relate to the findings from the previous chapters.

6.2 Identifying needs and measurement approach

Stage 1 was related to the research presented in Chapter 2 of the thesis and is concerned with what well-being is made up of and how it should be measured. The findings that well-being provide a multi-faceted construct related to how Connect Assist used some of their tools currently. The wheel of well-being is concerned with multiple facets of well-being and acknowledges them individually, while other tools are also used for other specific well-being factors such as stress and work-life balance. These measures however did not provide measures of well-being outcomes such as mood, life satisfaction, or depression, and represented the conglomeration of multiple measures tied together with no indication of redundancy or unique contribution to well-being outcomes. A number of variables identified as important in the literature were also not measured, such as personality, and time working with Connect Assist highlighted the fact that it would be beneficial for clients to be able to identify areas of concern.

Connect Assist's software enables service users to complete online questionnaires, to speak to call handlers in the centre, and to receive follow up emails, all of which can be linked to a service user's profile if they provide an identifier such as their email address for this purpose. This process is referred to as the service user's 'journey' and the practical implications of a method of identifying areas of need were applicable throughout this journey. The first stage of this was that an online assessment would allow the client to complete an initial well-being assessment in their own time, which could act as a first step towards understanding well-being and its associated factors. As a second stage of this journey, the service user calling in to the centre could have their responses to the well-being assessment brought up by the call handler, providing them with an initial understanding of the individual user's needs and providing discussion points raised by the assessment in further detail. Further stages could then involve follow up re-assessment, providing the service user with a tailored experience that improves knowledge and understanding and provides potential avenues for development.

This stage of the development process therefore highlighted the fact that a more systematic approach to well-being assessment was required and this was also an impression reinforced during project meetings. This reflected the practical implications of a multi-faceted approach to well-being assessment, as the process described above would be limited in its efficacy if only some aspects of well-being were assessed.

The results of Chapter 4 and Chapter 5 were relevant to this stage of development as they could demonstrate that single-item measures could represent a range of important variables to assess well-being and identify those variables which may be contributing to well-being issues for the service user.

6.3 Representing variables with single-item measures

While it was highlighted in stage 1 of the project that the multi-faceted approach was necessary for practical application, the ability to measure these facets in the time available was a concern. Service users who encountered a very long questionnaire at stage 1 of the journey may be less likely to continue if they are put off by a lengthy questionnaire and service users who went straight to telephone-based services would not be able to complete questions in the available call time. The results from Chapter 4 therefore were of practical importance in that they provided evidence for the validity and reliability of measures that reduced multi-item scales down to a single-item, drastically reducing the number of questions needed to complete an assessment and allowing questions to be potentially given over the phone quickly. The alternative to this, as suggested in the introduction and demonstrated by the tools currently used by Connect Assist, is to only measure some aspects of well-being, which was shown in Chapter 5 to be less adequate.

The findings of the research had demonstrated that the items were valid overall, providing confidence in their use but also providing information regarding the degree of confidence. For example, the findings allowed Connect Assist to understand that supervisor relationship provided a highly valid indicator compared to the multi-item scale but, in comparison, the control measure was less well related to its multi-item counterpart. This information can be provided in the user manual to provide the call handler with an indicator of which factors may benefit most from further questioning. This approach relates back to recommendations (Cronbach, 1990) that less robust measures can be used as an initial indicator and probed further where necessary. At the far end of the spectrum, the results highlighted the fact that some predictor variables which may be of interest could not be suitably measured by the single-item scales, such as attributional style.

The research therefore had practical implications to this stage in the project in the reduction of the number of items needed for a multi-faceted approach, improving the ability to identify specific well-being concerns and areas of need with limited time. The results also provided knowledge to the assessment provider related to the degree of confidence in the responses to each item.

6.4 Predicting well-being

Previous research had indicated that there was a likelihood of redundancy or overlap in the measures which was confirmed for some variables in Chapter 5. As had been highlighted in Chapter 3, assessment providers do not have time to spend measuring factors that do not provide practical use at the end and this was a key issue for Connect Assist. The findings from Chapter 5

were therefore able to provide a basis for which variables may be avoided with minimal impact to efficacy of the tool.

The results from Chapter 5 led to two main conclusions. The first was that measuring multiple groups of predictor variables provided significant prediction of well-being over individual sets of variables in almost all cases, suggesting that the multi-faceted approach to well-being prediction was warranted as they contributed significant unique variance alongside each other.

The second conclusion was that cognitive, emotional, positive, and negative well-being factors had unique associations with predictor variables, and this had a number of implications for well-being measurement within Connect Assist. The first implication was that measuring only one of these aspects of well-being would not provide results that could accurately be generalised to the others, meaning that in practice each aspect should be measured and scored independently rather than being combined into an overall well-being score. The rationale for this is that measuring these aspects of well-being as a combination would mean that any low or high score on one specific element of well-being would be unidentifiable and as a result all potential predictor variables would need to be assessed in order to determine the likely cause. In contrast, an independent scoring of the well-being outcomes would allow for streamlined assessment of likely causes, with unique relationships identified in the research used as a basis for the most likely antecedent of a specific outcome. As a practical example: in the case of low emotional well-being but high cognitive well-being, the combination of scores may lead to a moderate well-being score, with all predictor variables needing to be assessed. Meanwhile, independent scoring of outcomes in the same case would not only provide a more accurate assessment of the respondent's well-being in each domain but also indicate that, in this case, personality variables were the most appropriate target for assessment and improvement while circumstances could be given lower priority for measurement. A potential application of the research findings therefore is that independent scoring of outcomes therefore would provide a more accurate approach that reduces the risk of unnecessary items further down the line and provide focus streamlined to the most likely variables.

The second important element of the results was that some predictor variables were not predictive of well-being in any case and therefore could potentially be considered redundant. It is important to note however, that while multiple samples were used, the ability to generalise these conclusions is limited by the number of samples and total participants. Non-significance of the results could be due to lack of power to identify weak relationships, or, conversely, weak significant results could be the result of type-1 error. However, in the context of Connect Assist, where resources were extremely limited, only using the strongest predictors was an approach that would create a practical measure with the highest likelihood of identifying the correct issue and therefore these results were used alongside evidence from other research on potential overlap to create the basis of the assessment tool.

With the aforementioned generalisation limitation in mind, the apparently redundant items could be tentatively removed but still retained as 'second order' items to be employed where avenues based on initial assessment of first order items have been exhausted. Ongoing research could examine their importance in other groups and translate into ongoing improvement of the tool in terms of confirmation of tier 1 and tier 2 groups relevant to context.

The practical implications for Connect Assist were therefore that the number of measures were further reduced, removing supervisor relationship, understanding of role, consultation on change, positive coping styles, extraversion, conscientiousness, agreeableness, and openness. This approach would leave 12 items which still covered work characteristics, coping style, and personality. At the same time, an application of the tool was designed so that cognitive, emotional, positive, and negative well-being outcomes could be assessed and scored independently, with follow up questions on predictor variables based on the specific outcome scores of the respondent. In this way, the tool was designed to ask only those questions which the research demonstrated would be important to each individual based on their specific well-being profile. This was based on the theory that it was possible for individual respondents to have poor well-being in one respect but good well-being in another, for example poor cognitive well-being but good emotional well-being. While this was a necessary approach to reduce the potential for redundant items, it was also noted that while individual predictors may not have significant unique relationships with outcomes, the overall variance explained is still significant (e.g. in the case of positive emotional well-being and work characteristics). It was also acknowledged that it could still also be the case that there may be differences within outcome groups, for example between depression and anxiety, and therefore these independent scores were also retained.

6.5 Summary: Implementation in Connect Assist systems

The results from the research were therefore translated into practical well-being measurement for use in an applied environment where resources were at a minimum. The result was a measurement tool that provided a multi-faceted approach to well-being and identified the most appropriate areas for targeted intervention. The measurement tool was designed to begin with a multi-faceted approach to well-being assessment, which asked respondents to rate their well-being in terms of depression, anxiety, positive and negative mood, life and job satisfaction and stress. Scores on these measures could then be combined into cognitive, emotional, positive, and negative well-being scores. Based on these results, information was then provided to the respondent on each of these aspects of well-being and their meaning, in order to provide an informative questionnaire that included the respondent as an active part of the assessment process, rather than passively completing questions without understanding the relevance. Based on the results, a tailored approach to well-being assessment involving the independent unique contributors identified in the research. Further questions were therefore only seen by the

respondent if they were relevant to their scores on the outcome measures, reducing the amount of potentially irrelevant questions. Only those respondents who scored poorly on every aspect of well-being would therefore need to complete the entire set of questions. Information regarding the relevance of the items was also provided to the respondent at this stage.

Scores on these variables where then used to identify to the respondent the areas in which they scored well and poorly, providing further information on how these factors may be contributing to their well-being, followed by an overall assessment of their well-being and links to information and relevant contact numbers. All findings could be recorded and linked to their email address and any follow up assessment or call to the centre could use them for focused discussion. The tool therefore provides a multi-faceted approach to well-being assessment, which guides the respondent, improving their own knowledge and understanding. Furthermore it provides Connect Assist with a basis for tailored well-being improvement while being short enough to be practical and within their resources.

The process was successfully applied and tested in Connect Assist systems as a working prototype. Screenshots of each stage of the process are shown on the following pages:

Figure 6.1: Example question page from the tool design.

The Wellbeing Process Tool

1. On a scale of one to ten, how depressed would you say you are in general? (e.g. feeling 'down', no longer looking forward to things or enjoying things that you used to)

1 Not at all depressed
2
3
4
5
6
7
8
9
10 Extremely depressed

2. On a scale of one to ten, how anxious would you say you are in general? (e.g. Feeling tense or 'wound up', unable to relax, feelings of worry or panic)

1 Not at all anxious
2
3
4
5
6
7
8
9
10 Extremely anxious

3. Thinking about myself and how I normally feel, in general, I mostly experience positive feelings (for example: I feel alert, inspired, determined, attentive)

1 Strongly disagree

Figure 6.2: Example summary page with info box from the tool design.

The Wellbeing Process Tool

The Good

You scored well on these factors, click each one to see how they could be affecting your well-being:

Emotional Stability

Self Esteem

Optimism

> Being more likely to expect good things may help to keep a positive mood and positive approach to circumstances

6.5.1 Other applications

The approach demonstrated here is not the only application of the WPQ that is possible. The approach could also be applied in other ways. For example, the HSE management standards are used to monitor well-being over time and across institutions to provide users with an indicator of the state of their employees in comparison to national levels and previous years (HSE, 2004). The MS however only focuses on work-related circumstances and the measures developed here could potentially provide the same services while including more information and being shorter at the same time. Using the MS as an example, the measures could therefore potentially be used as a well-being audit tool, to monitor well-being over time, or to examine the effects of interventions, depending on the needs of the organisation.

6.6 Conclusions

The practical implementation of the WPQ has provided an important applied perspective on the use of well-being measures in situations where resources are limited. Although this applied phase was limited to Connect Assist systems, the results could also be applied to other online services such as NHS Direct (http://www.nhsdirect.nhs.uk/) to provide a brief assessment of well-being with a learning component. The results of this project show that the practical nature of the WPQ with a short number of questions with a simple 1-10 response scale throughout can be easily applied to existing online management software and used as a first step towards, or continuous monitor of, mental health in a small business or other online services, such as online CBT, which is available via prescription in some areas (http://www.beatingtheblues.co.uk/).

The progression of this part of the project also however demonstrated a number of issues related to the balance between practicality and rigour, and also highlighted areas for future research on the measurement approach:

Firstly, the implementation highlighted the fact that, even when the number of items was reduced to 20, a number that even measures of only one facet can be expected to exceed, further reduction was still needed for application in the Connect Assist environment. Although the tailored, multi-faceted approach to well-being assessment was acknowledged as a desirable element of the tool, practicality remained the definitive criteria.

An issue that was identified during the process was that the tool must be amenable to adjustment. It was highlighted that the items within the tool may be relevant to only some of the users and therefore using the entire measure involved an inherent amount of redundancy. Extrapolating this to wider groups, it can also be noticed that the tool may need to be open to having the items changed according to specific groups. For example, the work characteristics that are hazardous for well-being within seafarers or pilots may only be specific to them and would need to be added elsewhere. With this in mind, it is pertinent to acknowledge the potential limitation of

generalisability of the approach (model and method) when concluding that the tool is an appropriate measure of well-being. Although it is not the goal of this thesis to assess well-being theories or models against each other, and the measures are designed to be useful for any application, the conclusions still rely on some assumptions about well-being that need to be questioned. The first assumption is that well-being is the result of circumstances, personality, and other individual differences such as coping style. The question here is whether this is true of well-being as a whole, rather than just a representation of well-being as it relates to the workplace. The current research has demonstrated that the assumption is the case in working adults, but if we assume that it is relevant to well-being as a whole, then the same results should be found in a different population using circumstances that are specifically relevant to that group. The same can be said for factors such as self-esteem, which have been shown to be less important in collectivist cultures (Diener & Diener, 1995). The question arises as to whether self-esteem could be replaced with another aspect, e.g. conscientiousness, in that population and still provide the same general conclusions regarding the contributions of the variable groups. The approach used thus far therefore relies on the assumption that circumstances, personality, and individual differences such as coping style provide the framework, while the individual measures within that framework can be altered to suit the specific group, as suggested for the DRIVE model by Mark & Smith (2008). This approach would lead the WPQ to exist as a collection of potential measures and research would need to be performed in order to determine which individual items fit within the framework for each specific group.

The subjectivity of well-being also suggests that people can determine their SWB from different sources (Diener, 1984), and therefore while we may be able to make a case for the most important predictor variables, and the framework, it would be risky to completely remove other variables. In this case, the 'first tier', 'second tier' approach mentioned above may be best and research is needed to determine which variables can be changed and which can be considered 'first tier'.

A third unknown which is relevant to how the tool was implemented in Connect Assist systems is the stability of scores over time. The project involved the assumption of multiple measurements over time in order to assess change, however some of that change is likely to be due to measurement error. This also includes the assumption that our predictor variables are leading to well-being outcomes, while only cross-sectional research has been used. Further research is therefore needed to determine how much scores on the measures should be expected to change, i.e. their stability over time, and to provide more convincing evidence that our predictor variables lead to well-being outcomes, rather than well-being affecting reporting of the predictor variables.

The application of the well-being tool therefore provided research questions regarding whether items could be changed but the framework stay the same, how stable the measures are over time, and whether the predictor variables are truly predictive. Further research was therefore designed to acknowledge the issues raised in this and previous chapters and is presented in Chapter 7.

Chapter 7 – Exploring the limitations of the measures in the domain of students' well-being

7.1 Introduction

7.1.1 Background

The research presented so far has shown that the single-item approach compares favourably to multi-item measures for the assessment of high or low well-being outcomes and the prediction of these outcomes (Chapters 4 and 5). The results have also supported the multi-dimensional approach to well-being, as described in Chapter 2, and demonstrated that single-item measures can be used to identify the combined and independent relationships between well-being predictors and outcome measures.

The result of this research was support for a multi-dimensional single-item approach to well-being assessment and a series of single-item measures to represent outcomes, circumstances, coping style, and personality variables with associated validity and reliability information. A well-being measure (the WPQ) using these items was implemented in a work environment and provided a limited-resources approach to assessing well-being and potential associated circumstances and individual differences.

The research presented thus far was intended as the primary development of the measurement approach for a simple well-being assessment in applied settings with limited resources, however the research and application highlighted areas where further research is needed. This chapter presents research aimed at those areas.

7.1.2 Use in other applications
The research thus far has been limited to samples of working adults. While the justification for this is the relevance of this population to applied situations with practical limitations as described in Chapter 2, the well-being concepts applied in the research, such as the impact of circumstances or coping style, are not limited to this population. Furthermore, as suggested in Chapter 6, the specific variables involved, particularly in the case of demands and resources, may vary by situation but the influence of each factor should be generalisable in order to be applied as an assessment approach. This issue is explored by testing the measurement approach in a large sample of students.

Students' well-being

Alongside workplace well-being, the well-being of university students has also been studied for many years (Jones & Johnston, 1997) and high levels of depression, anxiety, and stress have been reported in undergraduate students (Bayram & Bilgel, 2008; Dahlin, Joneborg, & Runeson, 2005). Many of the same concepts in the WPQ, including demands, resources, coping style, and personality have also been applied in this research.

Student related circumstances are frequently referred to in student well-being research, including fear of failing and long hours of study (Jones & Johnston, 1997), social demands (Bayram & Bilgel, 2008; Dahlin, et al., 2005; Tully, 2004) and lack of social support (Swickert, Rosentreter, Hittner, & Mushrush, 2002). As a result, questionnaires have been specifically developed for assessing student specific circumstances that can impact well-being, such as the Inventory of College Students' Recent Life Experiences (ICSRLE) which includes factors such as time pressures, challenges to development, and social mistreatment (Kohn, Lafreniere, & Gurevich, 1990). Research using the ISCRLE has also concluded that the variables involved should be acknowledged in the management of stress by businesses whose employees may also be students (Fogaratnam, 2004), further supporting the necessity of establishing the generalisability of the approach to other areas.

Research on students' well-being has also acknowledged the impact of individual differences such as coping style and personality in the well-being process. Tully (2004) showed that non-direct coping strategies, including hostility and wishful thinking, were associated with higher levels of distress, as measured by the General Health Questionnaire (GHQ). Macan et al (Macan, Shahani, Dipboye, & Phillips, 1990) showed that those participating in greater time management behaviours (i.e. problem-focused coping) demonstrated greater job and life satisfaction and less tension.Kohn, Hay, & Legere(1994) also reported that students who used emotion-focused coping reported higher perceived stress than those who scored low on this coping style. In terms of personality, Swickert et al (2002) showed a significant main effect of extraversion on stress in undergraduate students and also provided evidence for the unique prediction of stress by extraversion and social support. Also of relevance to the research presented previously in the thesis is that in this study direct effects but not interactive effects were established, despite a correlation between the two predictor variables.

The similarity in the relevance of variables described above to the research presented prior to this chapter suggests that the WPQ items should also be applicable to this population, however the validity of the measures in a different population cannot be assumed (Nunnally, 1978). A study of the approach in a student sample would therefore lend further credence to the approach in terms of its generalisability and a potential confirmation of findings from previous chapters.

7.1.3 Absence of interactive effects

The importance of practicality in the design of the measure has also limited the research to direct effects. While this was deemed appropriate for the context of practical well-being measurement in resource-restricted environments, this presents a potential limitation of the research in that the potential impact of such effects was not established. Interactive effects have been proposed for each of the individual differences and personality variables included in the measure. For example, personality may interact with circumstances in terms of how they are perceived (DeNeve & Cooper, 1998) and therefore optimism, self-esteem, and self-efficacy may interact with demands, with high scores on these variables having a buffering effect on the impact of high demands on outcomes. Furthermore, resources may also influence the effect of demands, as suggested by the buffering hypothesis discussed in Chapter 2 (see also (Cohen & Wills, 1985).

The presence of interactive effects using these single-item measures should therefore be explored to determine any significant contribution to the prediction of outcomes or whether simple direct effects are sufficient for a simple, practical approach.

7.1.4 Limitations of the use of cross-sectional data

Stability of scores

Another consistent limitation of the research so far is the use of only cross-sectional data. In terms of the measures themselves, this means that while it has been suggested that the measures may be useful for repeated measures due to their brevity, it is not known to what degree any change in scores may be due to lack of stability or reliability over time. This is particularly relevant to the single-item measures as the only indicator of reliability currently available for the measures is an estimate based on correlation with a single multi-item alternative, which itself has limitations discussed in Chapter 3. Data on the reliability of scores on these measures over time will therefore present a better understanding of the properties of the items.

The health Scotland review of well-being measures (Parkinson, 2007) includes test-retest reliability where available, under the guidance that stable traits such as personality should be expected to have correlation coefficients of .70 or greater, while states such as anxiety should be lower by around .10 (Streiner & Norman, 2008) . The health Scotland review provides test-retest coefficients for many well-being related measures which appear to be highly variable.

 In terms of well-being outcomes, the satisfaction with life scale has reported test-retest reliability of .50 over 10 weeks and between .64 and .82 over 2 months (Pavot & Diener, 1993) while Watson et al (Watson, Clark, & Tellegen, 1988) report coefficients of .68 for general positive affect and .71 for general negative affect over 8 weeks. Other ratings however were as

low as .47 and .39 for daily ratings of positive and negative mood respectively and as high as .84 for the I-PANAS-SF after 8 weeks.

Moderate to high test-retest reliabilities have also been reported for optimism, self-efficacy, and self-esteem. The life orientation test (optimism) has a reported reliability of .67 to .74 after 7 weeks and the general self-efficacy scale .82 after the same time period (Røysamb & Strype, 2002). The visual analogue self-esteem scale has a reported test-retest reliability of .73 over one month (Brumfitt & Sheeran, 1999).

Moderate test-retest reliabilities have also been reported for negative coping styles such as denial (.54) and disengagement (.58) (Carver, et al., 1989). Social support using the ISEL has also shown moderate stability (tangible support .69, belonging support .65, appraisal support .63 after 6 weeks).

These results can therefore be used as benchmarks in order to determine the reliability of the single-item measures in comparison to established measures and therefore their suitability as measures over time in comparison to more comprehensive scales. At the same time, reliability of scores over time should be considered in terms of the variable under consideration, where high correlations for items such as circumstances may indicate insensitivity to change (Scarpello & Campbell, 1983). Robins et al (2001)have used this approach and found similar test-retest correlations for a single-item self esteem scale and the multi-item Rosenberg self esteem scale (mean .61 and .69 respectively) over 15 time intervals. Such results will also provide worthwhile evidence for practical situations by indicating how often the items should be administered to account for change in scores.

Causal relationships

The use of cross-sectional data also limits the assumptions of causal relationships between well-being predictor and outcome measures, while the importance of establishing the direction of relationships has been highlighted as an issue in well-being research (Diener, et al., 2003). The issue of causality is also relevant to the practical use of the WPQ as suggested in previous chapters, i.e. in the identification of the correct avenue for intervention, and therefore should be tested empirically.

In the present application of the research, circumstances, coping style, and personality are used as predictors of well-being outcomes on the assumption that these variables may affect scores on those outcomes, however the reverse relationship is also possible (Diener, et al., 2003; Ryan & Deci, 2001) and the use of predictor variables in this way should be justified.

7.1.5 Summary

The current chapter therefore presents the results of research which was designed to address these limitations. Following on from the research approach used in the previous chapters, the current chapter presents results from two studies. The first study was designed to confirm the multi-faceted approach to well-being in students using student-related demands based on single-item versions of the ICSRLE factors, resources based on single-item versions of the ISEL factors, and previously used coping, personality, and outcome measures. It was hypothesized that each variable would contribute significantly to the prediction of each well-being outcome. This therefore would confirm the use of the framework and single-item measures in a different sample while altering the specific variables to be more relevant to the sample as discussed in Chapter 6. The use of a much larger sample in this study also provides a better population in which to test interactions as smaller effects associated with interactions are more likely to be identified.

The second study examined the reliability of scores and the relationship among measures over a time period of 10 weeks. These results establish the correlation of scores on the measures over time which can then be compared to previous research on longer measures to establish the reliability of the single-item approach over time and the stability of scores. The results also provide a better indicator of causal relationship by using scores on predictor variables taken 10 weeks prior to scores on outcome variables. It was hypothesized that the predictor variables would maintain a significant relationship with outcomes when prior well-being was accounted for.

7.2 Method Study 1

7.2.1 Participants

The results from study 1 are taken from multiple final year student projects that included the WPQ. In total, 462 undergraduate psychology students took part in these studies. One of the student projects did not record age or gender. For the remaining 333 participants, 92.5% were female and 42% aged 18. Age range was 18-42 but 98% were aged 18-22.

7.2.2 Materials

Single-item measures of circumstances, individual differences, personality, and outcomes were used. The items related to individual differences consisted of the single-item measures of self blame, wishful thinking, and avoidance developed in Chapters 4 and 5 and the personality items consisted of the self-esteem, self-efficacy, and optimism single-item measures also developed in Chapters 4 and 5. The circumstances items were developed to relate to students demands and

resources and consisted of single-item measures of the 7 ICSRLE factors (Bodenhorn, Miyazaki, Ng, & Zalaquett, 2007) and the 3 ISEL factors (Sheldon Cohen, Mermelstein, Kamarck, & Hoberman, 1985) (self-esteem was not included from the ISEL factors as it was already represented). These newly developed single-item measures are shown below.

ICSRLE short (demands)
(Please consider the following elements of student life and indicate to what extent they have been a part of your life over the past 6 months:)

Challenges to your development (e.g. important decisions about your education and future career, dissatisfaction with your written or mathematical ability, struggling to meet your own or others' academic standards).
Time pressures (e.g. too many things to do at once, interruptions of your school work, a lot of responsibilities).
Academic Dissatisfaction (e.g. disliking your studies, finding courses uninteresting, dissatisfaction with school).
Romantic Problems (e.g. decisions about intimate relationships, conflicts with boyfriends'/girlfriends' family, conflicts with boyfriend/girlfriend).
Societal Annoyances (e.g. getting ripped off or cheated in the purchase of services, social conflicts over smoking, disliking fellow students).
Social Mistreatment (e.g. social rejection, loneliness, being taken advantage of).
Friendship problems (e.g. conflicts with friends, being let down or disappointed by friends, having your trust betrayed by friends).

ISEL short (resources)
(Please state how much you agree or disagree with the following statements:)

(Tangible) There is a person or people in my life who would provide tangible support for me when I need it (for example: money for tuition or books, use of their car, furniture for a new apartment).
(Belonging) There is a person or people in my life who would provide me with a sense of belonging (for example: I could find someone to go to a movie with me, I often get invited to do things with other people, I regularly hang out with friends).
(Emotional) There is a person or people in my life with whom I would feel perfectly comfortable discussing any problems I might have (for example: difficulties with my social life, getting along with my parents, sexual problems).

7.2.3 Design

A cross-sectional design.

7.2.4 Procedure

The studies took place throughout the academic year and were advertised on the experimental management system and conducted online. Students received course credit for completion of the questionnaire. Consent was provided electronically before any further stage of the questionnaire was presented. Instructions and debrief forms were also provided electronically at the start and end of the study respectively. Ethical approval was provided by Cardiff University Psychology Department Ethics Committee. Consent, instructions, and debrief forms can be found in Appendix 7.1.

7.2.5 Analysis Procedure

As suggested in previous chapters, assessing other aspects, such as negative mood or satisfaction, as aspects of SWB may highlight issues before developing into depression and anxiety, or may be beneficial for those not identifying mental health issues such as depression or not willing to report it (see Chapter 2). However, potential redundancy within outcome measures was also highlighted in previous research, the current method examines relationships with individual outcomes independently to provide a better understanding of this potential limitation.

Correlation analysis was used to determine the significant correlations between predictor and outcome scores. Variables with non-significant correlations with outcome measures were not entered into the regression for that outcome. A significance value of $p < .001$ was used as criteria for a significant correlation to account for the number of comparisons.

Hierarchical multiple regression analysis provided model summary and independent standardized beta weights. Variables were entered in groups in the order: demands, resources, coping style, personality. Model summaries were used to determine the significance of each group of variables in terms of the added variance predicted in the outcome. Standardised beta weights were used to determine which, if any, individual predictor variables within the variable groups were predicting significant unique variance when compared against all other individual variables in the regression.

Interactions were calculated and plotted using the methods provided in Aiken & West (1991).

7.3 Results Study 1

7.3.1 Univariate analysis

Correlations showed that coping style was associated with almost every outcome except wishful thinking with mood and satisfaction. Circumstances including demands and resources were associated inconsistently with outcomes, particularly in the case of romantic problems, which was only associated with depression, and time pressures, which was only associated with anxiety and stress. Time pressures was however second highest in correlation with stress at .37, after optimism at .39. Belonging support was also only associated with anxiety and stress and to a lesser degree positive mood. Optimism, self-esteem, and self-efficacy were most strongly correlated with outcomes on average at .62, .59, and .48 respectively, although each also showed relatively weaker correlations with stress at .28 to .39 than with other outcomes, particularly when compared to positive and negative affect at .51 to .75. The complete significant correlations are presented in table 7.1 below.

Table 7.1: Significant correlations between predictors and outcome variables

	Depression	Anxiety	Positve Mood	Negative Mood	Satisfaction	Stress
Challenges	.172**	.173**				.279**
Time Pressures		.245**				.368**
Academic Dissatisfaction	.295**	.311**	-.264**	.274**	-.300**	.237**
Romantic Problems	.170**					
Assorted annoyances	.339**	.334**	-.217**	.290**	-.226**	
Social Mistreatment	.491**	.419**	-.435**	.492**	-.426**	.246**
Friendship problems	.318**	.322**	-.273**	.299**	-.253**	
Tangible Support	-.319**	-.197**	.257**	-.376**	.408**	-.227**
Belonging Support		.259**	-.163**			.376**
Emotional Support	-.327**	-.194**	.327**	-.391**	.408**	
Optimism	-.660**	-.498**	.746**	-.706**	.701**	-.390**

Self Esteem	-.673**	-.478**	.687**	-.693**	.672**	-.347**
Self Efficacy	-.506**	-.430**	.583**	-.508**	.543**	-.280**
Blame Self	.385**	.418**	-.392**	.421**	-.326**	.291**
Wishful Thinking	.178**	.220**				.200**
Avoidance	.385**	.252**	-.340**	.369**	-.328**	.201**
N	462	462	462	461	461	462

7.3.2 Contribution of variable groups to each outcome

Total variance predicted ranged from 30% (stress) to 64% (positive and negative affect). Model summaries suggest that demands, resources, coping style, and personality each provide a significant increase in predicted variance in every well-being outcome, however due to the sample size, contributions as low as 2% (coping on stress) reach significance.

In terms of the relative contribution of each variable group, demands, as the first group entered in the regression, predicts between 22% - 29% of variance, the lowest being for stress and life satisfaction at 21 and 21% respectively, the highest for depression at 29%, preceded by negative mood at 27%. Beyond this, resources provide a smaller contribution, between 2% (anxiety) and 10% (satisfaction). Coping style also provides a relatively smaller contribution beyond resources, between 2% (stress) and 8% (negative mood). Personality variables provide the widest range of predicted variance, from 4% of stress to 28% of positive affect.

The results demonstrate the benefits of a multi-dimensional approach in general, with the total variance predicted in each outcome greater than demands alone by between 9% (stress) to 43% (positive mood). The contribution of each group across outcome measures however seems largely comparable, except where demands by far contribute the most to stress at 22%, compared to 2-4% for the remaining predictors beyond demands alone, and anxiety at 27%, compared to 2-16% for the remaining variables beyond demands alone.

Figure 7.1: Variance predicted by each predictor group in each outcome measure.[a]
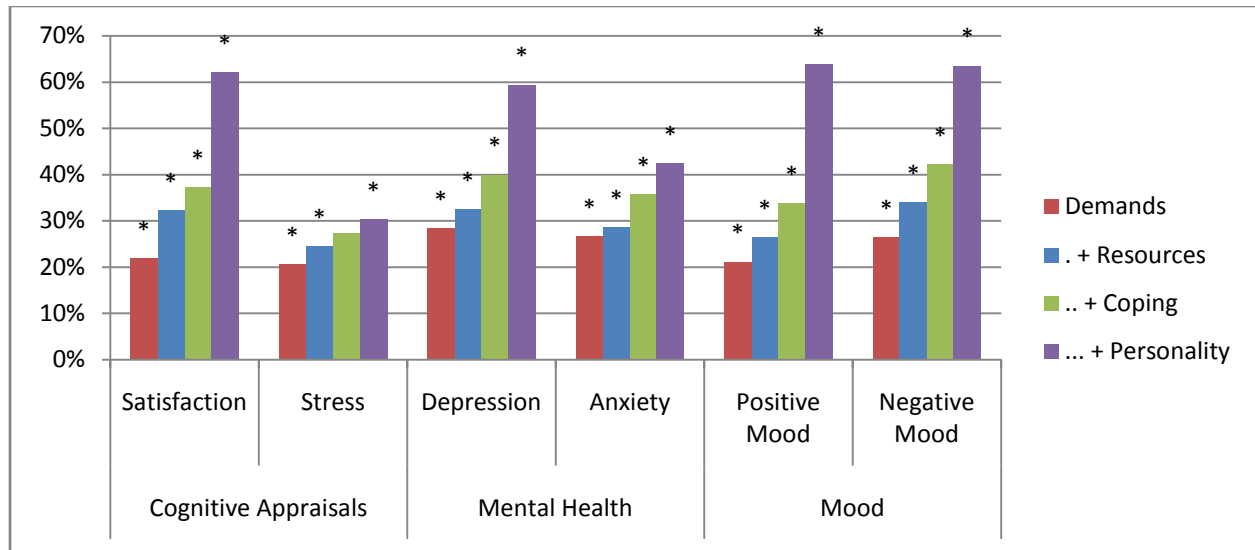
7.3.3 Contribution of individual items

The unique contributions of independent variables to the final model also reach significance, although romantic problems, friendship problems, emotional support, and wishful thinking do not provide significant contributions to any outcome. The results show significant contributions of closely associated variables in each case, with different types of demands, resources, and personality variables contributing significantly alongside each other. Differences in the contributions of items across outcomes is also evident. Time pressures represents an important variable for anxiety, along with belonging support which also contributes significantly to stress. Self blame and avoidance are most relevant to negative emotional variables, while personality variables have the strongest relationships overall, most notably with depression, positive mood, and negative mood.

Table 7.2: Standardized beta coefficients for each predictor variable on each outcome in the final stage of the regression model

	Depression	Anxiety	Positive Mood	Negative Mood	Satisfaction	Stress
Demands						
Challenges						
Time pressures		-.52*				
Academic Dissatisfaction	.08*	-.11**			-.10**	
Romantic problems						
Assorted annoyances	.09*	.10*				
Social Mistreatment	.11*		-.08*	.12**		
Friendship problems						
Resources						
Tangible support				-.09**	.14***	-.13**
Belonging support		.67**		-.07*	.12***	.50*
Emotional support						
CopingStyle						
Blame self		.17***				.09*
Wishful thinking						
Avoidance	.15***		-.08**	.10**	-.08*	
Personality						
Self Esteem	-.34***		.24***	-.29***	.30***	
Self Efficacy	-.23***	-.14**	.10**		.08*	
Optimism		-.12*	.42***	-.34***	.32***	-.14*
Total R^2	.59	.43	.64	.64	.62	.30

7.3.4 Interactions

The above regressions were repeated with interaction terms to assess the relative contribution of these predictors. The combined contribution of interactions was significant for depression and negative mood. Independently, the interaction between demands and resources was significant for both outcomes and the interaction between demands and personality was significant for depression. However the total contribution to the model was marginal at 1-2% predicted variance while standardised beta coefficients were also small and in no cases reached significance beyond the .05 level. The interactions are plotted in figures 7.2 to 7.4 below and show that resources buffer the effects of increasing demands, while optimism, self-esteem, and self-efficacy buffer the effects of demands in all cases.

Table 7.3: Contribution of interactions to depression and negative mood in terms of total predicted variance and standardised beta coefficients of individual predictors

Total R^2		Depression	Negative Mood
	Direct relationships	.57***	.60***
	Direct relationships plus interactions	.58*	.61*
Standardized Beta			
	Demands	.21***	.15***
	Resources	-.11**	-.17***
	Coping	.14***	.11**
	Personality	-.53***	-.58***
	Demands x Resources	-.07*	-.07*
	Demands x Coping	-.02	.03
	Demands x Personality	-.07*	-.05

Figure 7.2: Interaction between demands and resources for depression
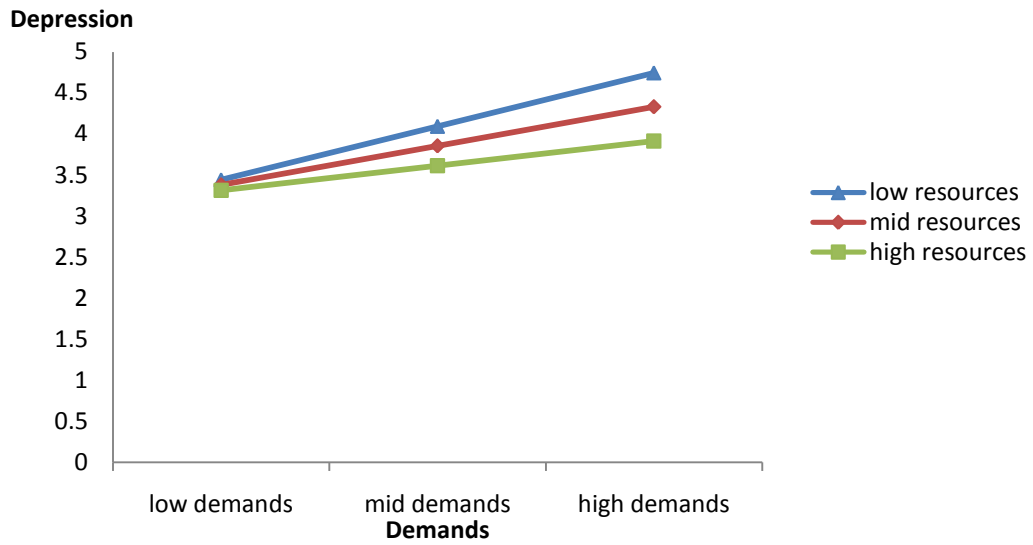
Figure 7.3: Interaction between demands and personality for depression
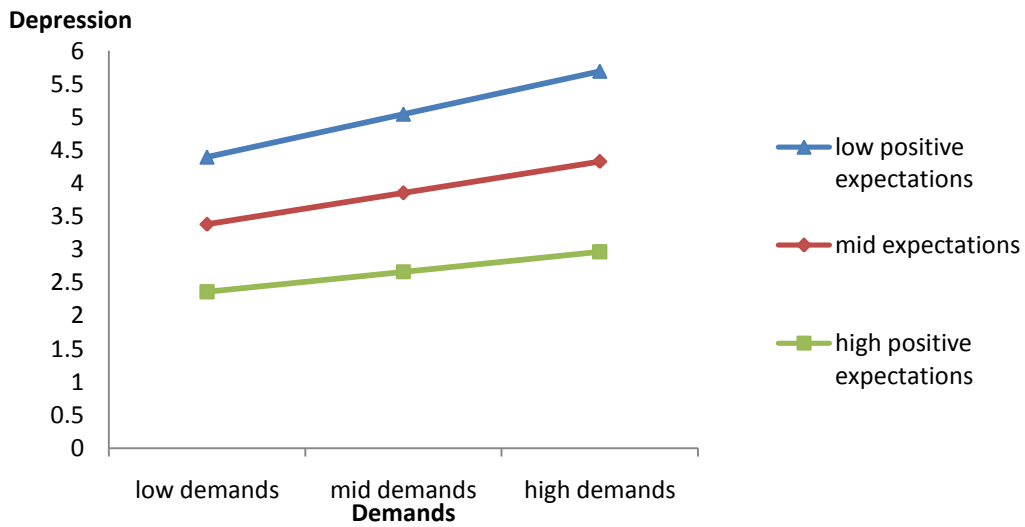
Figure 7.4: Interaction between demands and resources for negative mood

Negative Mood
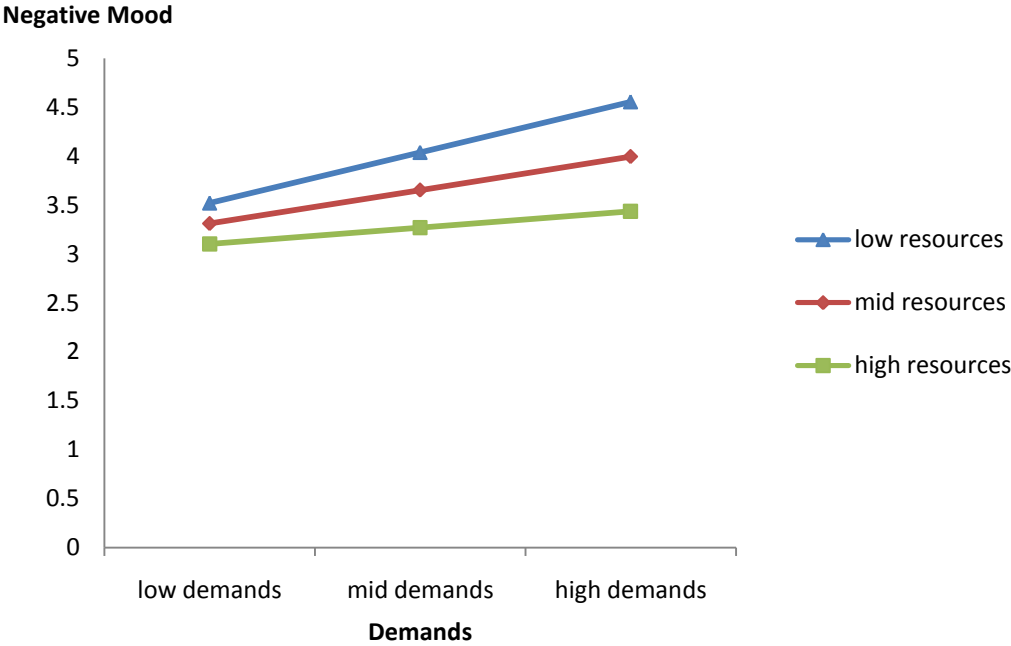
7.4 Discussion Study 1

7.4.1 Total and group-specific predicted variance
The results of study 1 showed significant relationships between all predictor and outcome variables, with all variable groups contributing significant further variance in each well-being outcome. This result supports the multi-faceted approach to well-being in students with the use of student-centred demands and resources replacing work-related ones, however the strength of the relationships was variable. Beyond demands, resources and coping style predicted generally smaller variance than personality. These results also suggest that the contribution of further variables beyond demands for anxiety and stress in undergraduate students is smaller than that for other outcomes, such as mood or life satisfaction. However the overall contribution of the combined set of predictors was at least 9% greater than that of demands alone, with an increase in questionnaire length of only 9 questions. With the fact that this increase in predicted variance was as high as 31% for the inclusion of these 9 items, the multi-faceted single-item approach is supported in university students.

7.4.2 Contribution of individual items
In terms of individual variables, romantic problems, wishful thinking, and time pressures had the weakest relationships overall in the regression model and in the initial correlations, suggesting that these variables were weakly associated with outcomes rather than the predicted variance being accounted for by other variables in the regression model. While romantic problems and wishful thinking were also not significantly related with individual outcome measures, time pressures was the strongest significant unique predictor of stress and other variable groups contributed little beyond this. This suggests that while time pressures was not an overall important variable for well-being as a whole, it was particularly important where stress is concerned. This result further indicates the importance of the multi-faceted conception of well-being, where generalising results across well-being may lead to inaccurate conclusions. The contributions of other variables also demonstrate this, where depression is most strongly associated with avoidance, self-esteem and optimism, while anxiety is most strongly related to time pressures, academic dissatisfaction, self blame, and self-efficacy. This also demonstrates differences in the relationships of predictor variables to outcomes between variables previously combined into outcome groups.

7.4.3 Interactive effects

Previous applications of the approach had neglected interactive effects for the purpose of maintaining practicality, however previous research and theory have discussed interactive effects as an area of well-being research that is under-represented (Diener, et al., 1999; Smith, et al., 2009). Although the direct effects of the DRIVE model were used as an initial basis for the research, the use of single-item measures may also be useful to explore more complex interactive relationships. It was therefore deemed worthwhile to establish that interactive effects could be relevant and identifiable using single-item measures.

The analyses suggested existing buffering effects, where personality and resources buffered the effects of demands on depression and negative mood. As a result, while low demands had a similar effect on well-being for everyone, high demands had a greater impact on well-being for those with low resources than those with medium or high resources. In terms of personality, having a more positive self-esteem, self-efficacy, and optimism, meant that the impact of demands on well-being was smaller.

This supports previous research by DeNeve & Cooper (1998). However the contribution to prediction of the model was marginal and as a result the exclusion of interactive effects in previous research in this thesis was not significantly detrimental to the conclusions. Furthermore, the effect was so small that it may be the result of Type 1 error. The available data however does suggest that personality and resources may have further benefits beyond their direct effect on outcomes and that demands may affect some people more than others. A potential implication of this in practice is that where demands cannot practicably be altered, interventions to improve positive perceptions or resources may help to reduce their impact.

7.4.4 Summary

Overall, the results support a multi-faceted, single-item approach to well-being measurement in university students, suggesting that previous findings are applicable beyond working adults and that specific variables, such as the individual demands and resources involved, can be substituted where appropriate while maintaining the general assumptions of the measurement approach. More specifically, the research has shown that a multi-faceted circumstances, individual differences, and personality approach can be applied to students with student-centred circumstances variables and single-item measures.

In terms of interactive effects, the results show that potential effects can be demonstrated using the items, whereby resources and personality can buffer the effects of demands on depression and negative mood. However, the contribution of these interactions to prediction of well-being outcomes is very small.

7.4.5 Introduction to study 2

As stated in the introduction to the chapter, the use of cross-sectional data does not provide any indication of causality. The second study of student well-being therefore examines the properties of the single-item measures in terms of the stability of scores and the relationship between predictor and outcome variables over time, while accounting for prior well-being.

7.5 Study 2 method

7.5.1 Participants

Eighty seven undergraduate and post graduate students aged 18 to 47 from across the university took part in the study. Mean age was 21, 75% were female. The majority (71%) identified as white, with the remaining identifying as Indian (2%) or Chinese (17%). Nine percent did not indicate.

7.5.2 Design

Short-term longitudinal design over 10 weeks.

7.5.3 Materials

Single-item measures from Chapter 5 were used for measuring negative coping style, self-esteem, self-efficacy and optimism, and well-being outcomes. Single-item measures of student-focused demands and resources were used from study 1 in this chapter. The full versions of these scales were also included in the first stage of this study in order to establish the concurrent and discriminant validity of the single-item measures.

7.5.4 Procedure

The study was advertised on the university notice board and those interested were provided with further information and a unique identifier in order to link responses at each time point. Scores at time 1 were taken 4 weeks into the academic year, those at time 2 were taken 4 weeks later at the end of the semester, and those at time 3 were taken 6 weeks following time 2, at the beginning of the following semester. Each stage of the study included a consent and instructions sheet at the beginning of the questionnaire and respondents could not continue beyond the consent form on the first page before consenting to participate. Debrief was presented at the end of the final stage of the research. Respondents were paid £5 at the completion of each time period. Ethical approval was provided by Cardiff University Psychology Department Ethics Committee. Consent, instructions, and debrief forms can be found in Appendix (7.3, 7.4, and 7.6).

7.5.5 Analysis procedure

Concurrent and discriminant validity procedures, as used in prior chapters, were used to validate the student-related single-item measures.

Test-retest correlations were used to assess the stability of scores on the scales at 4 weeks (time 1 – time 2) and 10 weeks (time 1 – time 3).

In order to examine prediction of outcomes, the regressions from previous studies are repeated with some design changes that provide a better indicator of causality. First, the outcome variable from time 3 is used as the criterion and the outcome score from stage 1 of the study is entered as a predictor into the regression first. Taking depression as an example, this means that what remains in the regression is variance in depression that is unaccounted for by previous levels of depression, also meaning that when predictor variables are entered at later stages of the regression the criterion becomes the difference between prior and present depression. This method of analysis also removes variance in the other predictor variables accounted for by prior depression, so that the pathway of well-being – predictor – later wellbeing is accounted for when the significant unique variance of the predictor variable is assessed.

Since support, coping, and personality were moderately stable over time, the time 1 scores of these variables were used. This reduces the likelihood that current depression causes the scores on the predictor variables and makes it more likely that scores on the predictor variables cause scores on the outcome variable. The demands variables are however less stable over time, as expected, since circumstances are expected to change. Therefore in the case of demands, time 3 scores on these variables were used so that the effect of present demands can be determined after the effect of prior outcome on present demands has been removed. The overall result therefore better represents the effect of demands on outcomes while accounting for the influence of prior outcomes.

7.6 Results study 2

7.6.1 Concurrent and discriminant validity of student measures

Concurrent validity of the demands items ranged from .41 (challenges to development) to .73 (social mistreatment), with an average of .57. In comparison, the range of correlations with measures of the other factors ranged from .00 (social mistreatment and romantic problems) to .47 (social mistreatment and assorted annoyances), with an average of .19 demonstrating good discriminant validity.

For the resources items, concurrent validity ranged from .55 to .73 but correlations across items was higher than for demands at between .35 to .59, suggesting potential overlap with the

measures, especially for belonging support where concurrent validity was .58 but discriminant validity with appraisal support was .59.

Table 7.4: Correlation between single-item measures (rows) and multi-item measures (columns) of the student demands items.

	Variables	1	2	3	4	5	6	7
1	Challenges to development	**.41***	.31**	.15	-.01	.21	.32**	.26*
2	Time pressures	.44***	**.50***	.09	-.05	.12	-.05	.02
3	Academic dissatisfaction	.30**	.30**	**.62***	.20	.21*	.15	.17
4	Romantic problems	.05	-.07	.04	**.70***	-.12	.04	.19
5	Assorted annoyances	.19	.22*	.20	.16	**.43***	.41***	.25*
6	Social Mistreatment	.32**	.06	.32**	.00	.47***	**.73***	.43***
7	Friendship problems	.22*	.19	.26*	.13	.32**	.38***	**.61***

Table 7.5: Correlation between single-item measures (rows) and multi-item measures (columns) of the student resources items.

	Variables	1	2	3
1	Tangible Support	**.55***	.35***	.49***
2	Belonging Support	.40***	.58***	**.59***
3	Appraisal Support	.41***	.51***	**.73***

7.6.2 Stability of well-being outcomes

Overall the average 4 week reliability was .58 and the average 10 week reliability was .54. The lowest correlations were for circumstances at 4 weeks (.31 for challenges to development) and at 10 weeks (.23 for assorted annoyances), with an overall average for circumstances at .45. Coping style had a higher reliability on average at .55 and personality higher still at .60. Support remained generally stable between .63 (tangible support 4 weeks) to .72 (emotional support 10 weeks), with an average of .67. Well-being as an outcome was moderately stable with an overall average of .62, ranging from .48 and .49 at 10 weeks for depression and anxiety, compared to .65 and .67 at 10 weeks for life satisfaction and stress respectively.

Table 7.6: Reliability of single-item scores over time as a correlation between scores at time 1 and those taken 4 and 10 weeks later.

	4 week reliability	10 week reliability
Challenges	.31[**]	.47[***]
Time Pressures	.52[***]	.34[**]
Academic Dissatisfaction	.58[***]	.53[***]
Romantic Problems	.61[***]	.45[***]
Assorted annoyances	.43[***]	.23[*]
Social Mistreatment	.53[***]	.44[***]
Friendship problems	.41[***]	.36[**]
Tangible support	.63[***]	.67[***]
Belonging support	.69[***]	.67[***]
Emotional support	.64[***]	.72[***]
Blame Self	.59[***]	.66[***]
Wishful Thinking	.42[***]	.50[***]
Avoidance	.52[***]	.59[***]
Self Esteem	.69[***]	.55[***]
Self Efficacy	.59[***]	.61[***]
Optimism	.54[***]	.60[***]
Depression	.56[***]	.48[***]
Anxiety	.62[***]	.49[***]
Positive Affect	.73[***]	.55[***]
Negative Affect	.68[***]	.59[***]
Life satisfaction	.76[***]	.65[***]
Life Stress	.68[***]	.67[***]

7.6.3 Prediction of change scores (10 weeks)

Hierarchical regressions followed the steps of previous chapters with the exception that time 3 well-being was the criterion variable and time 1 well-being was the first step in the regression. Time 1 predictor scores were used with the exception of time 3 demands due to the fact that they were more likely to vary over time.

The total variance explained ranged from 37% (anxiety) to 54% (life satisfaction). Prior well-being contributed significantly in each case, predicting between 23% (depression) and 44% (stress). Each stage of the analyses presented a significant contribution to well-being prediction in some way, with the exception of coping style which added a maximum of 1% to negative affect and anxiety. Time 3 demands added significantly to depression (r2 change .07) and anxiety (r2 change =.09) positive affect (r2 change = .03). Resources added further to depression (r2 = .04), negative affect (.04) and life satisfaction (.04). Personality contributed further again to depression (.09), positive affect (.09), negative affect (.07), and life satisfaction (.06). Overall the results indicate that each variable group contributes to later well-being beyond the variance attributable to prior well-being, with the exception of coping style and the exception of the stress outcome.

Examining the unique contributions when all variables are considered indicates that, when all other variables are accounted for, personality contributes uniquely to depression (standardized beta -.36), positive affect (.39), negative affect (-.32) and life satisfaction (.32). Demands contribute uniquely to anxiety (.28) when all other variables are accounted for, and resources (.20) also contributes uniquely to life satisfaction.

Table 7.7: Total variance predicted and individual contribution to model in time 3 outcomes by time 1 predictor variables and time 3 demands.

	Depression		Anxiety		Positive Affect		Negative Affect		Life Satisfaction		Stress	
	R^2 Change	B	R^2 Change	B	R^2 Change	B	R^2 Change	B	R^2 Change	B	R^2 Change	B
Stage 1	**.23*****		**.24*****		**.30*****		**.35*****		**.42*****		**.44*****	
t1 Well-Being		**.22***		**.33****		.22		**.35****		**.35*****		**.62*****
Stage 2	**.07****		**.09****		**.03***		.03		.02		.01	
t3 Demands		.17		**.28****		-.11		.12		-.07		.13
Stage 3	**.04***		.01		.03		**.04***		**.04***		.00	
Resources		-.14		.13		.15		-.13		**.20***		-.04
Stage 4	.00		.01		.00		.01		.00		.00	
Coping style		-.02		-.12		.05		-.10		.01		-.02
Stage 5	**.09*****		.03		**.09*****		**.07****		**.06****		.00	
Personality		**-.36*****		-.21		**.39*****		**-.32****		**.32****		.03
Total R^2	**.43*****		**.37*****		**.45*****		**.50*****		**.54*****		**.46*****	

7.7 Discussion

The purpose of the presented research was to develop understanding and further test the single-item multi-dimensional approach by assessing potential limitations which remained following initial testing. These limitations consist of limited relevance beyond working adults due to the homogeneity of the sample, limited relevance to complex models due to a lack of interactive effects, and limited understanding of causality due to a reliance on cross-sectional data.

7.7.1 Relevance beyond working adults
This limitation was tested by exploring the results in a student population to determine whether the approach applies beyond working adults, as research introduced at the beginning of the chapter demonstrated the relevance of the multi-dimensional approach to student populations.

The results showed that each predictor variable group contributed significantly to all outcomes and that the combined predictive variance was between 30 to 64%, thus supporting the multi-dimensional approach in students. These results were also comparable to previous studies presented in Chapter 5, supporting the generalisability of results of previous findings. Furthermore, the specific unique variance of single-item measures is also further supported, providing more evidence for previous findings which were based on limited samples.

The results also support the applicability of the approach to other samples with different specific issues, as the similarity in the contribution of variable groups is found even when student-centred circumstances are used instead of work characteristics. This suggests that a multi-dimensional framework including circumstances can be applied to specific situations with different contexts by altering the circumstances relevant to the group, confirming a proposed use of the approach presented in Chapter 6.

7.7.2 Relevance of the multi-dimensional approach
The design of the analysis also allowed a more definite assessment of the necessity for multiple outcomes. Previously, outcome groups were suggested to be necessary as their relationship with different predictor variables demonstrated differing potential results for different issues, such that poor circumstances may lead to issues for well-being in terms of cognitive appraisal but not other aspects of well-being. However, as these aspects of well-being were created by combining multiple outcomes, for example depression and negative mood, the necessity of each individual item in a measure designed with practicality in mind was not established.

In these results we can see that there are unique relationships found across even closely related outcomes, such as a strong relationship with time pressure for anxiety but not depression. Unique associations also exist across other variables such as belonging and tangible support being related to negative mood but not depression and self-efficacy with depression but not negative mood. These results support the issue raised in Chapter 5, that by combining the outcome measures into well-being groups (such as negative cognitive appraisal) there is the potential to

miss unique relationships for outcomes within those groups. The results also provide further support for the necessity of assessing multiple aspects of well-being rather than a generic well-being outcome and in practice may result in different interventions working for different well-being issues. However, as some of the differences are very small, further research should study the cost compared to the benefit of including some of the more closely related variables.

7.7.3 Reliability and causal relationships

Previous research on the items had established reliability based on an estimate formed on the correlation with multi-item measures. It was considered important to also establish the reliability of scores over time as an intention of the measures was proposed as assessing well-being over time and potential changes in well-being (Chapter 6).

The present research demonstrated comparable stability with multi-item measures as described in the introduction to this chapter. This suggests that the items provide comparable stability for assessing well-being over similar time periods and changes in scores being related to actual changes in these constructs.

The results showed changeable scores for variables expected to change (i.e. circumstances) and comparatively more stable scores for other variables (e.g. personality). The results provide a balance between stability and openness to change relevant to the constructs and therefore confidence in the use of the items for the previously mentioned purposes is established for up to 10 weeks. Further research should establish stability over longer periods, however a potential practical benefit of the single-item approach is that it is not costly or time consuming to measure on a regular basis.

7.7.4 Direction of causality

Previous conclusions had made assumptions regarding the direction of causality when comparing predictor measures to outcome variables. However, previous research has suggested and demonstrated that outcomes such as mood, depression, and satisfaction may influence reporting or recall of other factors such as negative circumstances (Pavot & Diener, 1993). This was also potentially evidenced in the present results, where univariate correlations and multivariate regressions are compared. Belonging support, despite logically having a negative relationship with negative well-being outcomes, had a significant positive relationship with anxiety and stress and both univariate and multivariate analyses. If direction of causality is assumed from this cross-sectional data, these results would suggest that higher support leads to higher stress and anxiety, however a more logical conclusion would be that as anxiety increases more effort is made to reduce the cause of anxiety and therefore support is increased. This would suggest reverse causation, in that an increase in anxiety leads to an increase in support. This conclusion is supported by the longitudinal results when prior anxiety is accounted for and the relationship

between support and anxiety is reduced and non-significant. The necessity of a longitudinal analysis is therefore demonstrated in that it has highlighted that a significant relationship found in the cross-sectional data is influenced by the effect of prior anxiety on support.

Beyond this, the results also demonstrate that some relationships are significant even when prior outcome score is accounted for, suggesting some causal relationships between predictor and outcome, with the exception that coping style was not significant for any outcome and no predictor beyond prior stress was significant for stress. The results regarding coping style may indicate that the coping style items represent how respondents react to stressors at the time rather than a general approach to coping that is consistent over time. This would explain why prior coping style does not predict well-being outcomes despite significant univariate correlations and is also in line with previous research that suggests that coping style can vary according to the type of stressor (Folkman & Lazarus, 1980). As discussed above however, the results may also indicate that prior well-being influences future coping behaviours. In terms of stress, prior stress was the only significant predictor of stress at time 3, indicating that the stress item is less responsive to prior resources, coping, or personality, nor is it responsive to current demands when prior stress is accounted for. This may reflect a more complex relationship between stress and stressors which is bi-directional and therefore the effect of current demands is not reflected in the analysis when prior stress is accounted for.

7.7.5 Effect sizes
At this stage of the research, the results of multiple regression analyses have shown the relationship between predictor variables and outcomes and also demonstrated the extent of this relationship over time when prior well-being is accounted for. Although many of these relationships have been statistically significant, it is particularly important in the context of application in practice to discuss the results in terms of the size of the effect a change in predictor will have on well-being, rather than purely whether the effect is or is not likely to occur by chance alone.

In previous research, where scores have been described on a categorical basis (e.g. high/low groups), this is often shown in terms of odds ratios using logistic regression. The current results are presented using continuous data and in this case the beta values from the multiple regression analysis can be used to examine effect sizes as they represent the increase in criterion (outcome) score that occurs with a change in predictor (Tabachnick & Fidell, 2007).

Applying this approach to the results of the longitudinal analysis provides an indication of how much scores on a predictor variable would need to change to affect a change in outcome 10 weeks later. Using the standardised beta scores we can see that for the statistically significant relationship between resources and life satisfaction, at a beta value of .20, a respondent's resources score would have to change by 5 points to effect a change in life satisfaction of 1 point. At the same time, interventions to change the combined score of optimism, self-esteem, and self-

efficacy by 3 points would lead to a 1 point change in depression, anxiety, positive affect, and negative affect and a similar effect size relationship is seen between demands and anxiety.

Putting this in context, the combined score of optimism, self-esteem, and self-efficacy represents a potential range of scores from 3-30 and so interventions would need to effect a 10% change in total personality score or a 30% increase in scores on any of these individual variables to influence well-being. These results indicate the degree to which an intervention would have to affect predictor variables to influence well-being, however further research is required to establish to what degree an intervention can be expected to change these scores as this has not been established with the current measures. Although this provides an indication of the way in which interventions may influence well-being in practice, the fact that some individual effect sizes are small further indicates that, although relationships may be significant with some approaches, the use of multiple predictors may be required in a combined way for these relationships to have a practical effect on well-being as a whole. The effect of this combined approach is indicated in Chapter 5, where the difference in average well-being scores based on the combined predictor scores is demonstrated.

7.8 Final summary

This chapter provided support for the approach used so far, for the use of single-item measures in multiple applications, and furthered understanding of practical well-being measurement in terms of generalisability, interactive effects, and the nature of relationships between variables and over time.

The results generally support those of previous studies presented in Chapters 4 and 5 and the proposals for potential applications of the method described in Chapter 6. Beyond general support, the research has also been useful in establishing previously unknown but important characteristics of the measures. Firstly, the results have indicated that the framework of a multi-dimensional, single-item approach that involves circumstances, coping style, personality, and multi-dimensional well-being outcomes, can also be applied to students. This provides some evidence for the generalisability of the research presented earlier in the thesis beyond working adults. Secondly, the results have provided evidence for the stability of the scores over time and prediction of well-being outcomes over time by some of the measures. This has implications in practice in that users of the items can be aware of the reliability of the scores over time and the potential for changes in predictor scores to affect well-being outcomes. The results have also provided some more insight into the degree to which prior outcome scores can affect predictor scores. More specific relationships involving individual outcomes have also been explored, where previously outcomes have been grouped together, and the nature of the direction of relationships has been more appropriately measured.

The research presented in this chapter is therefore beneficial in providing knowledge on the previously unknown characteristics of the measures and providing a more comprehensive body of knowledge to enhance understanding of what to expect if the items were to be applied in practice. The research presented builds upon that of the previous chapters and provides further support for single-item, multi-dimensional approach to be developed for practical use in situations with limited resources.

7. 9 Limitations

The research presented in stage 1 of this chapter is designed to assess generalisability of the results presented in previous chapters to a new group and does so in the form of students rather than working adults. However, the results are still limited in that this group itself is not largely generalisable beyond students in their early 20s studying in the UK and a larger, broader sample of participants would again be beneficial. The prior limitation regarding the respondents' knowledge of the concepts involved also apply to this study and a less academic population is also necessary to acknowledge this limitation.

A preferable approach to the research carried out would have been to use one large pool of participants would completed both study 1 and study 2, giving a larger overall number of participants for the second study and a consistent sample between the two studies. Practical limitations of the project prevented this, including project time – meaning that the two studies were run concurrently, limited available incentives for repeated stages of the longitudinal analysis, and the fact that the participants in study 1 were already completing a larger questionnaire related to the student projects leaving limited space for the validation section of the research.

As discussed in previous chapters, the limitations associated with using a broad research approach and multiple variables are also relevant to this research, although again confidence is found in the consistency of many of the findings and can be established in consistency with future research.

Although the longitudinal study is preferable over the cross-sectional approach used in previous studies, the length of time between measures (10 weeks) is limited in its ability to demonstrate well-being over time. The current longitudinal study was limited by project time constraints and therefore a project focused on the longitudinal accuracy of the measures and relationships among factors over the course of months and years would be beneficial. This would provide more evidence for what would be expected when using the measures over time periods that may be relevant to repeat service users of Connect Assist with chronic issues.

Chapter 8: Final summary of objective achievements and possibilities for further research

8.1 Objective 1 achievements and future research

This chapter returns to the objective set out at the beginning of this thesis to summarise the contribution and implications of the research presented and how future research may build upon the findings.

1) To identify the issues related to well-being and practicality that are relevant to Connect Assist and practical well-being measurement in general

8.1.1 Achievements
Chapter 2 contributed to this topic by bringing together research on various aspects of well-being and their implications for measurement and management, both generally and specifically in contexts with limited resources. The chapter highlights the issue of complexity in well-being in terms of its definition and associated factors and the implications of this complexity when well-being is considered a target for monitoring and change. Limitations of current methods due to this complexity that are particularly relevant in applied settings are summarised and a potential method for reducing the length and complexity of well-being measures is proposed.

This chapter therefore contributes by providing discussion points relating to research and practice where well-being management is concerned and also provides a potential method for acknowledging the issues in the form of a multi-dimensional, single-item approach. As well as the implications for applied settings, the content of the chapter may also be relevant to research which previously may have considered variables in isolation due to practical restrictions, where a multi-dimensional approach may be more suitable.

8.1.2 Future research
Although the above is achieved with relevance to the context of the thesis, the chapter is not an exhaustive list of factors associated with well-being or used in other well-being definitions. More work on this topic could further understanding of the issues by exploring how factors not fully examined in the chapter may be relevant. There are a vast number of variables associated with well-being and theories as to how these and other variables may relate and so not all could be practicably included, however further research could incorporate some of these theories or variables and examine their relevance to what has already been discussed. This could be done in the form of complementary variables or alternative theories not explored; the relevance of more general life-orientated circumstances and the eudaimonic perspective are two particularly useful starting points for this. For example, although the eudaimonic approach is not fully represented in the issues discussed, the approach also involves multiple dimensions and therefore the issues

may also be applicable here. The chapter is also limited in terms of the generalisability of the issues and the variables involved to populations and further work may provide a broader understanding of the issues and their relevance to other groups, for example more individualistic cultures.

8.2 Objective 2 achievements and future research

2) To examine whether single-item measures can accurately represent the relevant well-being constructs.

8.2.1 Achievements

Although single-item measures represented a potential approach which emphasised practicality, their controversial and limited use in research meant that their suitability in terms of accuracy had to be established. Chapters 3 and 4 contributed to this objective by reviewing studies showing direct comparisons to established measures of well-being constructs and added to this by testing newly developed single item measures covering a wider range of variables and tests. Chapter 3 summarised research which had directly compared single and established measures in order to directly indicate the comparative accuracy of single-item measures to multi-item measures and clinical interview. This chapter contributed to the topic by providing a basis for further research within the project and a collection of results for other researchers to examine when considering the single-item approach in well-being. It also provided a source of evidence for the use of single-item measures where they can often be dismissed based on traditional opinion (Wanous, et al., 1997). The results also highlighted issues for single-item measures where there appears to be a limited number of studies that validate single-item measures in terms of their construct validity, along with results that do exist indicating that there is no consistently generalisable conclusion regarding the validity of single-item measures. The chapter contributes to this topic by demonstrating that single-item measures should be validated in each case and by demonstrating the range of accuracy of single-item measures in representing well-being and associated constructs.

Finally, the chapter also contributes by suggesting a potential method for ensuring validity in terms of the use of examples to maximise consistency between the single-item measure, the comparison, and the respondent's understanding of the construct, which builds upon previous suggestions by (Jenkins & Taber, 1976). The chapter therefore provides an understanding of the potential for single-item measures to represent well-being constructs, the issues associated with such items, and a potential method for reducing issues when developing new items. The chapter also has implications for applied use of single-item measures by demonstrating which variables have the strongest support for single-item measurement.

Chapter 4 contributes to this topic further by examining the use of single-item measures for a range of well-being and associated variables, thus developing understanding of what constructs

may or may not be accurately represented using single-item measures. The chapter also provides a more comprehensive study of the psychometric properties of single-item measures than Chapter 3 focused on, showing other characteristics of single-item measures rarely studied in terms of the estimated reliability of the items, and practically relevant characteristics in terms of the proportion of respondents likely to be correctly identified as having high or low well-being. The chapter also uses multiple studies to demonstrate how the design of a measure may impact on its validity and that some variables are consistently difficult to capture in a single-item. The chapter therefore has implications for single-item measurement for well-being by demonstrating their psychometric properties in a variety of well-being associated constructs and a basis for understanding what characteristics of a variable or measure may contribute to these properties. More specifically, the results of the chapter have implications for future research or applications which may wish to incorporate positive coping style and attributional style in a multi-directional approach. The results indicate that if the length of the questionnaire needs to be limited then doing so by using single-item measures of other factors, such as work characteristics or personality, may allow for important dimensions to be considered with limited impact on validity or reliability, while single-item measures of positive coping or attributional style may not be suitable.

8.2.2 Future research

Chapter 3 focused specifically on studies that had directly compared single- and multi-item measures and established mainly the construct validity of single-items as the key psychometric property of an accurate measure. Further research would expand on this by including other psychometric properties such as predictive validity and reliability, even when construct validity had not been established, to get a more well-rounded understanding of single-item performance as a whole, to build upon the evidence for accuracy provided here. Reviews of single-item measures from other domains would be less relevant but still provide a more general understanding of what makes a good single-item measure.

Chapter 4 took a broad approach to selection of variables, with the result being a large number of comparisons. Future research would enhance the findings of this chapter by looking more closely at specific variables in larger groups to confirm the conclusions made in this research. The range of variables included is also not exhaustive and other variables could be examined in single-item form to provide a more comprehensive understanding of the relevance of variables when considered alongside each other and their suitability for the single-item approach. The research also looked broadly at psychometric properties, including construct and diagnostic validity and reliability at once, so each of these properties should be examined more thoroughly in isolation. This again would add to the depth of understanding for an approach that has focused on establishing a broad foundation for future work.

Further work would also be beneficial to develop understanding of issues raised in the present research regarding the factors that make a variable suitable or unsuitable for single-item measurement and whether alternative single-item designs may improve performance. The

research in its present form does not establish the exact contribution of item design towards single-item performance or the exact nature of positive coping and attributional style that made the single-item approach unsuitable. Similarly, these measures were compared to one established multi-item measure each and future research should examine whether other measures could more appropriately be converted into a single-item measure.

In summary, the research presented provides a multi-faceted exploration of the use of single-item measures that can impact future use of the approach. Chapters 3 and 4 bring together old and new information on the suitability of single-item measures for well-being assessment with limited resources and a foundation for future research to provide greater depth of understanding. Applications of the approach using these items would also benefit from the results as they provide evidence for the degree of confidence the user could have in each measure and the results provided by them.

8.3 Objectives 3 and 4 achievements and future research

3 and 4) To establish the benefits of the single-item multi-dimensional approach

8.3.1 Achievements
Chapter 5 contributed to this objective by testing the predictive validity of single-item measures in combination and isolation and comparing this to the measurement of the same variables and fewer variables using multi-item measures. The results demonstrated the benefit of the single-item multi-dimensional approach by showing that, overall, the items predicted significant variance which was comparable to multi-item measures while requiring much fewer items. Further to this, it was established that if questionnaire length was devoted to measuring fewer well-being predictors more comprehensively, the predictive validity was smaller than that found by measuring more predictors using single-item measures, which itself still required fewer items than the multi-item approach even though more variables were assessed.

The multi-dimensional approach was also supported by showing that using individual differences and personality items added to the significance of the predictive model and that the significance of predictive variables was not consistent across different well-being outcomes. The analysis also demonstrated that, as well as providing a significant combined contribution to well-being prediction, single-item measures provided the fidelity to identify unique contributions of closely associated variables.

The implications of this research are that it demonstrates that the multidimensional approach was suitable for predicting well-being outcomes because multiple factors contribute significantly to the prediction of well-being outcomes and because the contribution of individual factors cannot be generalised across different aspects of well-being. Further implications for this are that the practical issues that arise when measuring multiple factors in terms of questions required can be circumvented by using single-item measures and that enabling the multifaceted approach in this

way is preferable in terms of predictive validity than only measuring one or two factors with multi-item measures. This means that future research on well-being may benefit from incorporating relevant factors even if using single-item measures to represent them and that, in applied settings, the preferable approach would be to use single-items to acknowledge the multiple factors that are relevant to well-being rather than to only measure one or two factors. In this way, the approach demonstrated in this chapter may help to develop measures that can identify the relevant issues of well-being in applied settings without prohibitively long measures. The results also suggest that current measurement approaches such as the HSE management standards would benefit from including further variables even if single-item measures were used to assess those variables.

8.3.2 Future research

As with the previous objective, the methods leave room for further research to more closely examine relationships which may be limited or spurious in the current studies due to broad spectrum comparisons and limited sample sizes. A more complex and numerous series of studies would provide further understanding of the unique and shared variance of individual items and variable groups. The results also provided some indication that variables may be associated with different outcomes based on the way they impact on the individual (e.g. bullying as a circumstance that due to its nature may have strong emotional outcomes) and the understanding of these relationships could be more comprehensively mapped.

In summary, the results demonstrate the relationship between multiple factors and well-being outcomes, that a multi-dimensional approach using single-item measures is a more efficient way of predicting well-being outcomes, and that single-item measures may also be able to identify a specific cause of well-being issues. Further research is needed to provide a better understanding of, and confidence in, the exact nature of associations between individual variables and their individual necessity and redundancy for well-being in different contexts. The results therefore provide a basis for further research on the dimensions of well-being and implications for application of well-being measures in identifying well-being and potential causes.

8.4 Objective 5 achievements and future research

> 5) To apply the method in practice and establish directly the suitability and potential issues associated with the approach in applied settings.

8.4.1 Achievements

Chapter 6 contributes to this objective by discussing a period of time spent with Connect Assist to employ the measurement approach within their systems. This shows that the approach is

applicable to the systems used by a SME that works through online and telephone systems and that it can be incorporated into their current methods. The chapter presents a prototype application that can be used to suggest a possible use of the research in practice and has implications for applied settings by providing a template application of brief well-being measures.

8.4.2 Future research
Further work in this regard would help to improve the application based on feedback and generalisability to other applications and any alterations that would be necessary for this. Other future research could examine the application in other similar organisations, as suggested in Chapter 6, and also further explore whether the approach would be well received by service users.

8.5 Objective 6 achievements and future research

> 6) To develop the approach by examining issues raised by application or research thus far.

8.5.1 Achievements
Chapter 7 contributed to this objective by exploring what were considered to be the main outstanding issues remaining after the research and application in previous chapters.

The results of this chapter suggested that the approach is applicable beyond the use of work measures in working adults, with the implication that the model could be applied in other groups with context relevant items. The results also provided further support for previous findings by repeating them and finding largely similar results. This chapter also acknowledged a previously un-investigated aspect of the well-being process in terms of moderating or buffering effects mentioned frequently in the literature. The results suggest that interactions may exist among these variables but that they contribute little to prediction of outcomes. The results also examine the issue of direction of causality, which is important due to the expectation but lack of confirmation in previous chapters that predictor variables actually lead to outcomes.

The implications of this chapter are most significant for establishing the confidence in conclusions from previous chapters and confirming the suitability of the approach more broadly. Beyond this, they have implications for future research by further establishing the multi-dimensional, single-item approach in well-being assessment beyond the context of working adults and work circumstances. The results also provide a basis for the use of the approach in practice by indicating their relevance for student populations and an initial basis for expecting interventions focused on predictor variables to affect future well-being.

8.5.2 *Future research*

This chapter contributes by acknowledging key elements of the measure which were seen as important unknowns that needed to be resolved. Again, due to the nature of the project, which requires an end product for the company, a broad approach was taken to cover important elements rather than a focused, exhaustive analysis of a specific issue. Further research is needed to examine each of these issues more comprehensively to expand on this initial basis of understanding. Future research would also look at longer periods of time to get a more complete understanding of the stability of scores over time.

Other situations could also be examined to include other cultures, as evidence suggests that some aspects of well-being are not universal, such as the difference between individualist and collectivist cultures in terms of the factors that appear important for life satisfaction (Diener, et al., 2003). Causal relationships could also be more comprehensively assessed by studying well-being over time with interventions to improve the predictor variables and the impact on outcomes. This would build upon the research in this chapter which shows how much the variables vary without intervention, allowing change attributable to intervention to be established.

8.6 Final Summary

Overall, the thesis brings together research on well-being and its implications for practical assessment. It demonstrates the suitability of a well-being measurement approach using single-item measures as a solution and what the impact is on well-being assessment and prediction if this approach is taken. The necessity of a multi-dimensional approach is demonstrated and the use of single-item measures in this approach is explored. As an initial step in the research of this approach, the results provide promising support for the potential of practical measures that may enable well-being management for those who have limited resources to dedicate to this important issue. The results also provide a potential approach for multiple variables to be acknowledged in well-being research, with limited impact on survey length, where the exact contribution of so many potential factors is not fully understood and could be developed in this way.

Each of the chapters leaves room for further research in terms of further understanding the relationships involved and the applicability in other populations. Although the research as a whole does not provide a definitive conclusion regarding any one individual aspect of the well-being process and single-item measurement, it provides evidence in a number of domains that together support the use of the developed items in practical applications and also provide a foundation for further research to build upon.

Another result of the presented research is a well-being tool that Connect Assist can use as part of their process to help people who contact them with well-being issues.

The measures created within the project provide items that can identify issues relating to a broad spectrum of well-being factors including depression, anxiety, positive mood, and life satisfaction, which are key areas of well-being as discussed in Chapter 2. These items have been presented to connect assist in a format that allows them to quickly identify well-being issues in clients online or over the telephone.

Further to this, items have been developed to identify a potential source of the well-being issue, from circumstances, personality factors, or coping style. These items allow Connect Assist to identify an area where particular focus may be useful.

These tools could be applied in this way either through the website or over the telephone and provide information to the client and to counsellors to identify and monitor well-being initially and over time. Traditional methods of measurement which the items developed were compared against would be too long and cumbersome to be used in this environment in this way and the items provided to connect assist therefore open up an avenue for well-being assessment and monitoring that was previously unavailable to them.

References

Ahles, T. A., Ruckdeschel, J. C., & Blanchard, E. B. (1984). Cancer-related pain-II. Assessment with visual analogue scales. *Journal of Psychosomatic Research, 28*(2), 121-124.

Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. Sage.

Albuquerque, I., de Lima, M. P., Matos, M., & Figueiredo, C. (2012). Personality and subjective well-being: What hides behind global analyses? *Social Indicators Research, 105*(3), 447-460.

Alleman, J. R. (2002). Online counseling: The Internet and mental health treatment. *Psychotherapy: Theory, Research, Practice, Training, 39*(2), 199.

Anderson, P., Jané-Llopis, E., & Cooper, C. (2011). The imperative of well-being. *Stress and Health, 27*(5), 353-355.

Anseel, F., Lievens, F., Schollaert, E., & Choragwicka, B. (2010). Response rates in organizational science, 1995–2008: A meta-analytic review and guidelines for survey researchers. *Journal of Business and Psychology, 25*(3), 335-349.

Ayalon, L., Goldfracht, M., & Bech, P. (2010). 'Do you think you suffer from depression?' Reevaluating the use of a single item question for the screening of depression in older primary care patients. *International Journal of Geriatric Psychiatry, 25*(5), 497-502.

Bagley, C. (2005). Robustness of two single-item self-esteem measures: Cross-validation with a measure of stigma in a sample of psychiatric patients. *Perceptual and Motor Skills, 101*(1), 335-338.

Bandura, A. (1988). Self-efficacy conception of anxiety. *Anxiety research, 1*(2), 77-98.

Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology, 51*(6), 1173.

Bayram, N., & Bilgel, N. (2008). The prevalence and socio-demographic correlations of depression, anxiety and stress among a group of university students. *Social Psychiatry and Psychiatric Epidemiology, 43*(8), 667-672.

Bell, I. R., Cunningham, V., Caspi, O., Meek, P., & Ferro, L. (2004). Development and validation of a new global well-being outcomes rating scale for integrative medicine research. *BMC Complementary and Alternative Medicine, 4*(1), 1.

Bernhard, J., Sullivan, M., Hürny, C., Coates, A. S., & Rudenstam, C. M. (2001). Clinical relevance of single item quality of life indicators in cancer clinical trials. *British Journal of Cancer, 84*(9), 1156-1165.

Black, C. M. (2008). *Working for a healthier tomorrow: Dame Carol Black's review of the health of Britain's working age population*: The Stationery Office.

Bodenhorn, N., Miyazaki, Y., Ng, K.-M., & Zalaquett, C. (2007). Analysis of the inventory of college students' recent life experiences. *Multicultural Learning and Teaching, 2*(2).

Bowling, A. (2005). Just one question: If one question works, why ask several? *Journal of Epidemiology and Community Health, 59*(5), 342-345.

Brief, A. P., Butcher, A. H., George, J. M., & Link, K. E. (1993). Integrating Bottom-Up and Top-Down Theories of Subjective Well-Being: The Case of Health. *Journal of Personality and Social Psychology, 64*(4), 646-653.

Brumfitt, S. M., & Sheeran, P. (1999). The development and validation of the Visual Analogue Self-Esteem Scale (VASES) 1. *British Journal of Clinical Psychology, 38*(4), 387-400.

Busseri, M. A., Sadava, S. W., & DeCourville, N. (2007). A hybrid model for research on subjective well-being: Examining common- and component-specific sources of variance in life satisfaction, positive affect, and negative affect. *Social Indicators Research, 83*(3), 413-445.

Butt, Z., Wagner, L. I., Beaumont, J. L., Paice, J. A., Peterman, A. H., Shevrin, D., et al. (2008). Use of a single-item screening tool to detect clinically significant fatigue, pain, distress, and anorexia in ambulatory cancer practice. *Journal of Pain and Symptom Management, Vol.35*(1), pp.

Carver, C. S. (1997). You want to measure coping but your protocol's too long: Consider the brief cope. *International Journal of Behavioral Medicine, 4*(1), 92-100.

Carver, C. S., Scheier, M. F., & Weintraub, K. J. (1989). Assessing Coping Strategies: A Theoretically Based Approach. *Journal of Personality and Social Psychology, 56*(2), 267-283.

Chang, Y., WANG, P. C., LI, H. H., & LIU, Y. C. (2011). Relations among depression, self-efficacy and optimism in a sample of nurses in Taiwan. *Journal of nursing management, 19*(6), 769-776.

Cohen, L. H., Gunthert, K. C., Butler, A. C., O'Neill, S. C., & Tolpin, L. H. (2005). Daily affective reactivity as a prospective predictor of depressive symptoms. *Journal of Personality, 73*(6), 1687-1714.

Cohen, S., & Lichtenstein, E. (1990). Perceived stress, quitting smoking, and smoking relapse. *Health Psychology, 9*(4), 466.

Cohen, S., Mermelstein, R., Kamarck, T., & Hoberman, H. M. (1985). Measuring the functional components of social support *Social support: Theory, research and applications* (pp. 73-94): Springer.

Cohen, S., Williamson, G., Spacapan, S., & Oskamp, S. (1988). The social psychology of health. *The social psychology of health*.

Cohen, S., & Wills, T. A. (1985). Stress, Social Support, and the Buffering Hypothesis. *Psychological Bulletin, 98*(2), 310-357.

Costa, P. T., & McCrae, R. R. (1980). Influence of extraversion and neuroticism on subjective well-being: Happy and unhappy people. *Journal of Personality and Social Psychology, 38*(4), 668-678.

Crane, H. M., Van Rompaey, S. E., Dillingham, P. W., Herman, E., Diehr, P., & Kitahata, M. M. (2006). A single-item measure of health-related quality-of-life for HIV-infected patients in routine clinical care. *AIDS Patient Care and STDs, 20*(3), 161-174.

Cronbach, L. J. (1990). *Essentials of Psychological Testing*(5th ed.). New York, NY: HarperCollinsPublishers, Inc.

Cummins, R. A. (2010). Subjective Wellbeing, Homeostatically Protected Mood and Depression: A synthesis. *Journal of Happiness Studies, 11*(1), 1-17.

Cummins, R. A., & Lau, A. L. D. (2005). 6th Australian Conference on Quality of Life: Understanding subjective well-being. 25th November 2004, Stonington Mansion, Melbourne, Australia. *Expert Review of Pharmacoeconomics and Outcomes Research, 5*(1), 11-14.

Dahlin, M., Joneborg, N., & Runeson, B. (2005). Stress and depression among medical students: A cross-sectional study. *Medical Education, 39*(6), 594-604.

Dawson, D. A., Pulay, A. J., & Grant, B. F. (2010). A comparison of two single-item screeners for hazardous drinking and alcohol use disorder. *Alcoholism: Clinical and Experimental Research, Vol.34*(2), pp.

De Boer, A. G. E. M., Van Lanschot, J. J. B., Stalmeier, P. F. M., Van Sandick, J. W., Hulscher, J. B. F., De Haes, J. C. J. M., et al. (2004). Is a single-item visual analogue scale as valid, reliable and responsive as multi-item scales in measuring quality of life? *Quality of Life Research, 13*(2), 311-320.

DeNeve, K. M., & Cooper, H. (1998). The Happy Personality: A Meta-Analysis of 137 Personality Traits and Subjective Well-Being. *Psychological Bulletin, 124*(2), 197-229.

Denissen, J. J. A., Geenen, R., Selfhout, M., & Van Aken, M. A. G. (2008). Single-item big five ratings in a social network design. *European Journal of Personality, Vol.22*(1), pp.

Denkinger, M. D. (2011). Reduced sensitivity to change-A relevant limitation of the visual analogue scale to assess fear of falling? *Journal of the American Geriatrics Society, 59*(4), 773.

Diener, E. (1984). Subjective well-being. *Psychological Bulletin, 95*(3), 542-575.

Diener, E. (1996). Traits can be powerful, but are not enough: Lessons from subjective well-being. *Journal of Research in Personality, 30*(3), 389-399.

Diener, E. (2000). Subjective well-being: The science of happiness and a proposal for a national index. *American Psychologist, 55*(1), 34-43.

Diener, E., & Diener, M. (1995). Cross-cultural correlates of life satisfaction and self-esteem. *Journal of Personality and Social Psychology, 68*(4), 653.

Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The satisfaction with life scale. *Journal of Personality Assessment, 49*(1), 71-75.

Diener, E., Kesebir, P., & Lucas, R. (2008). Benefits of accounts of well-being - For societies and for psychological science. *Applied Psychology, 57*(SUPPL. 1), 37-53.

Diener, E., Oishi, S., & Lucas, R. E. (2003). Personality, Culture, and Subjective Well-being: Emotional and Cognitive Evaluations of Life. *Annual Review of Psychology, 54*, 403-425.

Diener, E., Sandvik, E., Seidlitz, L., & Diener, M. (1993). The relationship between income and subjective well-being: Relative or absolute? *Social Indicators Research, 28*(3), 195-223.

Diener, E., Sapyta, J. J., & Suh, E. (1998). Subjective Well-Being Is Essential to Well-Being. *Psychological Inquiry, 9*(1), 33-37.

Diener, E., Suh, E. M., Lucas, R. E., & Smith, H. L. (1999). Subjective well-being: Three decades of progress. *Psychological Bulletin, 125*(2), 276-302.

Diener, E., Suh, E. M., Lucas, R. E., & Smith, H. L. (1999). Subjective wellbeing: 3 decades of progress. *Psychological Bulletin, 125*(2), 276-302.

Dillman, D. A., Sinclair, M. D., & Clark, J. R. (1993). Effects of questionnaire length, respondent-friendly design, and a difficult question on response rates for occupant-addressed census mail surveys. *Public Opinion Quarterly, 57*(3), 289-304.

Dolan, P., Peasgood, T., & White, M. (2008). Do we really know what makes us happy? A review of the economic literature on the factors associated with subjective well-being. *Journal of Economic Psychology, 29*(1), 94-122.

Drolet, A. L., & Morrison, D. G. (2001). Do we really need multiple-item measures in service research? *Journal of Service Research, 3*(3), 196-204.

Edwards, J. A., Webster, S., Van Laar, D., & Easton, S. (2008). Psychometric analysis of the UK Health and Safety Executive's Management Standards work-related stress Indicator Tool. *Work & Stress, 22*(2), 96-107.

Embretson, S. E., & Reise, S. P. (2000). *Item response theory for psychologists*: Psychology Press.

Fogaratnam, G. B., P. . (2004). Balancing the demands of school and work: stress and employed hospitality students. *International journal of contemporary hospitality management, 16*, 237-245.

Folkman, S., & Lazarus, R. S. (1980). An analysis of coping in a middle-aged community sample. *Journal of Health and Social Behavior*, 219-239.

Furnham, A., Petrides, K., Jackson, C. J., & Cotter, T. (2002). Do personality factors predict job satisfaction? *Personality and Individual Differences, 33*(8), 1325-1342.

Galesic, M., & Bosnjak, M. (2009). Effects of questionnaire length on participation and indicators of response quality in a web survey. *Public Opinion Quarterly, 73*(2), 349-360.

Gargiulo, R. A., & Stokes, M. A. (2009). Subjective wellbeing as an indicator for clinical depression. *Social Indicators Research, 92*, 517-527.

Handwerk, P. G., Carson, C., & Blackwell, K. (2000). *On-line vs. paper-and-pencil surveying of students: A case study.* Paper presented at the 40th Annual Meeting of the Association of Institutional Research.

Harrison, M. J., Boonen, A., Tugwell, P., & Symmons, D. P. M. (2009). Same question, different answers: A comparison of global health assessments using visual analogue scales. *Quality of Life Research, 18*(10), 1285-1292.

Häusser, J. A., Mojzisch, A., Niesel, M., & Schulz-Hardt, S. (2010). Ten years on: A review of recent research on the Job Demand-Control (-Support) model and psychological well-being. *Work and Stress, 24*(1), 1-35.

Hayes, N., & Joseph, S. (2003). Big 5 correlates of three measures of subjective well-being. *Personality and Individual Differences, 34*(4), 723-727.

Headey, B., & Wearing, A. (1989). Personality, Life Events, and Subjective Well-Being: Toward a Dynamic Equilibrium Model. *Journal of Personality and Social Psychology, 57*(4), 731-739.

Heise, D. R. (1969). Separating reliability and stability in test-retest correlation. *American sociological review*, 93-101.

Herzog, A. R., & Bachman, J. G. (1981). Effects of questionnaire length on response quality. *Public Opinion Quarterly, 45*(4), 549-559.

Hoeppner, B. B., Kelly, J. F., Urbanoski, K. A., & Slaymaker, V. (2011). Comparative utility of a single-item versus multiple-item measure of self-efficacy in predicting relapse among young adults. *Journal of Substance Abuse Treatment, 41*(3), 305-312.

HSE. (2004). Management Standards.   Retrieved 20th November, 2012, from http://www.hse.gov.uk/stress/standards/

HSE. (2013). Stress and psychological disorders in Great Britain 2013. Retrieved from http://www.hse.gov.uk/statistics/causdis/stress/stress.pdf

Huppert, F. A., Marks, N., Clark, A., Siegrist, J., Stutzer, A., Vittersø, J., et al. (2009). Measuring Well-being across Europe: Description of the ESS Well-being Module and preliminary findings. *Social Indicators Research, 91*(3), 301-315.

Jenkins, G. D., & Taber, T. D. (1976). A Monte Carlo study of factors affecting three indices of composite scale reliability. *Journal of Applied Psychology, 62*(4), 392-398.

Johnson, J. V., & Hall, E. M. (1988). Job strain, work place social support, and cardiovascular disease: a cross-sectional study of a random sample of the Swedish working population. *American Journal of Public Health, 78*(10), 1336-1342.

Jones, M. C., & Johnston, D. W. (1997). Distress, stress and coping in first-year student nurses. *Journal of Advanced Nursing, 26*(3), 475-482.

Judge, T. A., Erez, A., Bono, J. E., & Thoresen, C. J. (2002). Are measures of self-esteem, neuroticism, locus of control, and generalized self-efficacy indicators of a common core construct? *Journal of Personality and Social Psychology, 83*(3), 693-710.

Karasek, R. A. (1979). Job Demands, Job Decision Latitude, and Mental Strain - Implications for Job Redesign. *Administrative Science Quarterly, 24*(2), 285-308.

Kerr, R., McHugh, M., & McCrory, M. (2009). HSE Management Standards and stress-related work outcomes. *Occupational Medicine, 59*(8), 574-579.

Keyes, C. (2006). Subjective Well-Being in Mental Health and Human Development Research Worldwide: An Introduction. *Social Indicators Research, 77*(1), 1-10.

Kluemper, D. H., Little, L. M., & DeGroot, T. (2009). State or trait: effects of state optimism on job-related outcomes. *Journal of organizational Behavior, 30*(2), 209-231.

Knapp, M., McDaid, D., Mossialos, E., & Thornicroft, G. (2006). *Mental health policy and practice across Europe*: McGraw-Hill International.

Kohn, P. M., Hay, B. D., & Legere, J. J. (1994). Hassles, coping styles, and negative well being. *Personality and Individual Differences, 17*(2), 169-179.

Kohn, P. M., Lafreniere, K., & Gurevich, M. (1990). The inventory of college students' recent life experiences: A decontaminated hassles scale for a special population. *Journal of Behavioral Medicine, 13*(6), 619-630.

Kraut, A. I., Wolfson, A. D., & Rothenberg, A. (1975). Some effects of position on opinion survey items. *Journal of Applied Psychology, 60*(6), 774.

Larsen, R. J., Diener, E., & Emmons, R. A. (1985). An evaluation of subjective well-being measures. *Social Indicators Research, 17*(1), 1-17.

Lazarus, R. S. (1966). Psychological stress and the coping process.

Lee-Flynn, S. C., Pomaki, G., DeLongis, A., Biesanz, J. C., & Puterman, E. (2011). Daily cognitive appraisals, daily affect, and long-term depressive symptoms: The role of self-esteem and self-concept clarity in the stress process. *Personality and Social Psychology Bulletin, 37*(2), 255-268.

Lesage, F. X., & Berjot, S. (2011). Validity of occupational stress assessment using a visual analogue scale. *Occupational Medicine, 61*(6), 434-436.

Littman, A. J., White, E., Satia, J. A., Bowen, D. J., & Kristal, A. R. (2006). Reliability and validity of 2 single-item measures of psychosocial stress. *Epidemiology, 17*(4), 398-403.

Lucas, R. E., Diener, E., & Suh, E. (1996). Discriminant Validity of Well-Being Measures. *Journal of Personality and Social Psychology, 71*(3), 616-628.

Luria, R. E. (1975). The validity and reliability of the Visual Analogue Mood scale. *Journal of Psychiatric Research, 12*(1), 51-57.

Lyubomirsky, S., King, L., & Diener, E. (2005). The benefits of frequent positive affect: Does happiness lead to success? *Psychological Bulletin, 131*(6), 803-855.

Macan, T. H., Shahani, C., Dipboye, R. L., & Phillips, A. P. (1990). College Students' Time Management: Correlations With Academic Performance and Stress. *Journal of Educational Psychology, 82*(4), 760-768.

Maciejewski, P. K., Prigerson, H. G., & Mazure, C. M. (2000). Self-efficacy as a mediator between stressful life events and depressive symptoms. Differences based on history of prior depression. *British Journal of Psychiatry, 176*(APR.), 373-378.

MacKay, C. J., Cousins, R., Kelly, P. J., Lee, S., & McCaig, R. H. (2004). 'Management Standards' and work-related stress in the UK: Policy background and science. *Work & Stress, 18*(2), 91-112.

Mark, G., & Smith, A. P. (2012). Occupational stress, job characteristics, coping, and the mental health of nurses. *British Journal of Health Psychology, 17*(3), 505-521.

Mark, G., & Smith, A. P. (2012). Effects of occupational stress, job characteristics, coping, and attributional style on the mental health and job satisfaction of university employees. *Anxiety, Stress & Coping, 25*(1), 63-78.

Mark, G. M., & Smith, A. P. (2008). Stress models: A review and suggested new direction. *Nottingham University Press, 3*, 111-144.

Maydeu-Olivares, A., Kramp, U., García-Forero, C., Gallardo-Pujol, D., & Coffman, D. (2009). The effect of varying the number of response alternatives in rating scales: Experimental evidence from intra-individual effects. *Behavior research methods, 41*(2), 295-308.

McCormack, B., Boldy, D., Lewin, G., & McCormack, G. R. (2011). Screening for depression among older adults referred to home care services: A single-item depression screener versus the Geriatric Depression Scale. *Home Health Care Management & Practice, Vol.23*(1), pp.

McDowell, I. (2010). Measures of self-perceived well-being. *Journal of Psychosomatic Research, 69*(1), 69-79.

Michaelson, J., Mahony, S., & Schifferes, J. (2012). Measuring well-being. Retrieved October, 2012, from http://www.neweconomics.org/publications/entry/measuring-well-being

Mitchell, A. J., Meader, N., & Symonds, P. (2010). Diagnostic validity of the Hospital Anxiety and Depression Scale (HADS) in cancer and palliative settings: a meta-analysis. *Journal of Affective Disorders, 126*(3), 335-348.

Mitchell, A. J., Morgan, J. P., Petersen, D., Fabbri, S., Fayard, C., Stoletniy, L., et al. (2012). Validation of simple visual-analogue thermometer screen for mood complications of cardiovascular disease: The emotion thermometers. *Journal of Affective Disorders, 136*(3), 1257-1263.

Nagy, M. S. (2002). Using a single-item approach to measure facet job satisfaction. *Journal of Occupational and Organizational Psychology, 75*(1), 77-86.

Nichols, A. L., & Webster, G. D. (2013). The single-item need to belong scale. *Personality and Individual Differences, 55*(2), 189-192.

Nunnally, J. C. (1978). *Psychometric theory*(2nd ed.). London: McGraw-Hill.

Pantilat, S. Z., O'Riordan, D. L., Dibble, S. L., & Landefeld, C. S. (2012). An assessment of the screening performance of a single-item measure of depression from the edmonton symptom assessment scale among chronically ill hospitalized patients. *Journal of Pain and Symptom Management, 43*(5), 866-873.

Parasuraman, S., Purohit, Y. S., Godshalk, V. M., & Beutell, N. J. (1996). Work and family variables, entrepreneurial career success, and psychological well-being. *Journal of Vocational Behavior, 48*(3), 275-300.

Parkin, D., Rice, N., Jacoby, A., & Doughty, J. (2004). Use of a visual analogue scale in a daily patient diary: Modelling cross-sectional time-series data on health-related quality of life. *Social Science and Medicine, 59*(2), 351-360.

Parkinson, J. (2007). Review of scales of positive mental health validated for use with adults in the UK: Technical report. *Health Scotland, a WHO Collaborating Centre for Health Promotion and Public Health Development*.

Pavot, W., & Diener, E. (1993). The affective and cognitive context of self-reported measures of subjective well-being. *Social Indicators Research, 28*(1), 1-20.

Peterson, C., & Seligman, M. E. (1987). Explanatory style and illness. *Journal of Personality, 55*(2), 237-265.

Purnell, A., & Johnson, J. (2008). *Improving health and work: Changing lives*. London: The Stationary Office.

Quine, L. (1999). Workplace bullying in NHS community trust: Staff questionnaire survey. *British Medical Journal, 318*(7178), 228-232.

Rick, J., Briner, R. B., Daniels, K., Perryman, S., & Guppy, A. (2001). A critical review of psychosocial hazard measures.

Ried, L. D., Tueth, M. J., Handberg, E., & Nyanteh, H. (2006). Validating a self-report measure of global subjective well-being to predict adverse clinical outcomes. *Quality of Life Research, 15*(4), 675-686.

Robins, R. W., Hendin, H. M., & Trzesniewski, K. H. (2001). Measuring global self-esteem: Construct validation of a single-item measure and the Rosenberg Self-Esteem Scale. *Personality and Social Psychology Bulletin, 27*(2), 151-161.

Rohland, B. M., Kruse, G. R., & Rohrer, J. E. (2004). Validation of a single-item measure of burnout against the Maslach Burnout Inventory among physicians. *Stress and Health, 20*(2), 75-79.

Rosenberg, M. (1965). *Society and the adolescent self-image*. Princeton, NJ: Princeton University Press.

Roth, P. L., & Bevier, C. A. (1998). Response rates in HRM/OB survey research: Norms and correlates, 1990-1994. *Journal of Management, 24*(1), 97-117.

Røysamb, E., & Strype, J. (2002). Optimism and pessimism: Underlying structure and dimensionality. *Journal of Social and Clinical Psychology, 21*(1), 1-19.

Rushford, N. (2006). Fear of gaining weight: Its validity as a visual analogue scale in anorexia nervosa. *European Eating Disorders Review, 14*(2), 104-110.

Russell, J. A., Weiss, A., & Mendelsohn, G. A. (1989). Affect Grid: A Single-Item Scale of Pleasure and Arousal. *Journal of Personality and Social Psychology, 57*(3), 493-502.

Ryan, R. M., & Deci, E. L. (2001). On happiness and human potentials: A review of research on hedonic and eudaimonic well-being. *Annual Review of Psychology, 52*, 141-166.

Rydstedt, L. W., Devereux, J., & Sverke, M. (2007). Comparing and combining the demand-control-support model and the effort reward imbalance model to predict long-term mental strain. *European Journal of Work and Organizational Psychology, 16*(3), 261-278.

Sackett, P. R., & Larson, J. R., Jr. (1990). Research strategies and tactics in industrial and organizational psychology. In M. D. Dunnett & L. M. Hough (Eds.), *Handbook of industrial and organizational psychology* (2nd ed., Vol. 1, pp. 419 - 489). Palo Alto, CA: Consulting Psychologists Press.

Sagrestano, L. M., Rodriguez, A. C., Carroll, D., Bieniarz, A., Greenberg, A., Castro, L., et al. (2002). A comparison of standardized measures of psychosocial variables with single-item screening measures used in an urban obstetric clinic. *Journal of obstetric, gynecologic, and neonatal nursing : JOGNN / NAACOG, 31*(2), 147-155.

Sanne, B., Torp, S., Mykletun, A., & Dahl, A. A. (2005). The Swedish Demand-Control-Support Questionnaire (DCSQ): Factor structure, item analyses, and internal consistency in a large population. *Scandinavian journal of public health, 33*(3), 166-174.

Saucier, G. (1994). Mini-markers: A brief version of Goldberg's unipolar Big-Five markers. *Journal of Personality Assessment, 63*(3), 506-516.

Scandura, T. A., & Graen, G. B. (1984). Moderating effects of initial leader-member exchange status on the effects of a leadership intervention. *Journal of Applied Psychology, 69*(3), 428-436.

Scarpello, V., & Campbell, J. P. (1983). Job satisfaction: Are all the parts there? *Personnel Psychology*(36), 577 - 600.

Scheffer, A. C., Schuurmans, M. J., Vandijk, N., Van Der Hooft, T., & De Rooij, S. E. (2010). Reliability and validity of the visual analogue scale for fear of falling in older persons. *Journal of the American Geriatrics Society, 58*(11), 2228-2230.

Scheier, M. F., Carver, C. S., & Bridges, M. W. (1994). Distinguishing Optimism From Neuroticism (and Trait Anxiety, Self-Mastery, and Self-Esteem): A Reevaluation of the Life Orientation Test. *Journal of Personality and Social Psychology, 67*(6), 1063-1078.

Schiffrin, H. H., & Nelson, S. K. (2010). Stressed and happy? Investigating the relationship between happiness and perceived stress. *Journal of Happiness Studies, 11*(1), 33-39.

Schimmack, U., Oishi, S., Furr, R. M., & Funder, D. C. (2004). Personality and life satisfaction: A facet-level analysis. *Personality and Social Psychology Bulletin, 30*(8), 1062-1075.

Schwarzer, R., & Hallum, S. (2008). Perceived teacher self-efficacy as a predictor of job stress and burnout: Mediation analyses. *Applied Psychology, 57*(s1), 152-171.

Schwarzer, R., & Jerusalem, M. (1995). Generalized Self-Efficacy scale. In J. Weinman, S. Wright & M. Johnston (Eds.), *Measures in health psychology: A user's portfolio. Causal and control beliefs* (pp. 35-37). Windsor, UK: NFER-NELSON.

SCMH. (2007). *Policy Paper 8: Mental Health at Work: Developing the business case*. London: The Sainsbury Centre for Mental Health.

Self, A., Thomas, J., & Randall, C. (2012). Measuring national well-being: life in the UK, 2012.

Sharpe, J. P., Martin, N. R., & Roth, K. A. (2011). Optimism and the Big Five factors of personality: Beyond neuroticism and extraversion. *Personality and Individual Differences, 51*(8), 946-951.

Sheldon, K. M., Ryan, R. M., Rawsthorne, L. J., & Ilardi, B. (1997). Trait self and true self: Cross-role variation in the big-five personality traits and its relations with psychological authenticity and subjective well-being. *Journal of Personality and Social Psychology, 73*(6), 1380-1393.

Siegrist, J. (1996). Adverse health effects of high-effort/low-reward conditions. *Journal of occupational health psychology, 1*(1), 27-41.

Siegrist, J., Starke, D., Chandola, T., Godin, I., Marmot, M., Niedhammer, I., et al. (2004). The measurement of effort-reward imbalance at work: European comparisons. *Social Science and Medicine, 58*(8), 1483-1499.

Şimşek, Ö. F. (2011). An intentional model of emotional well-being: The development and initial validation of a measure of subjective well-being. *Journal of Happiness Studies, 12*(3), 421-442.

Sin, N. L., & Lyubomirsky, S. (2009). Enhancing well-being and alleviating depressive symptoms with positive psychology interventions: A practice-friendly meta-analysis. *Journal of Clinical Psychology, 65*(5), 467-487.

Skoogh, J., Ylitalo, N., Larsson omeróv, P., Hauksdóttir, A., Nyberg, U., Wilderäng, U., et al. (2010). 'A no means no'-measuring depression using a single-item question versus Hospital Anxiety and Depression Scale (HADS-D). *Annals of Oncology, 21*(9), 1905-1909.

Sloan, J. A., Aaronson, N., Cappelleri, J. C., Fairclough, D. L., Varricchio, C., Barofsky, I., et al. (2002). Assessing the clinical significance of single items relative to summated scores. *Mayo Clinic Proceedings, 77*(5), 479-487.

Smith, A., Johal, S., & Wadsworth, E. (2000). *The scale of occupational stress: The Bristol stress and health at work study*: HSE books Sudbury.

Smith, A., Wadsworth, E., Chaplin, K., Allen, P., & Mark, G. (2009). *WHAT IS A GOOD JOB? The relationship between work/working and improved health and well-being*.

Smith, A. P., McNamara, R. L., & Wellens, B. T. (2004). *Combined effects of occupational health hazards*: HSE Books.

Sparks, K., Faragher, B., & Cooper, C. L. (2001). Well‐being and occupational health in the 21st century workplace. *Journal of Occupational and Organizational Psychology, 74*(4), 489-509.

Steel, P., Schmidt, J., & Shultz, J. (2008). Refining the Relationship Between Personality and Subjective Well-Being. *Psychological Bulletin, 134*(1), 138-161.

Strasser, F., Muller-Kaser, I., & Dietrich, D. (2009). Evaluating cognitive, emotional, and physical fatigue domains in daily practice by single-item questions in patients with advanced cancer: A cross-sectional pragmatic study. *Journal of Pain and Symptom Management, Vol.38*(4), pp.

Streiner, D. L., & Norman, G. R. (2008). *Health measurement scales: a practical guide to their development and use*: Oxford university press.

Suh, E., Diener, E., & Fujita, F. (1996). Events and Subjective Well-Being: Only Recent Events Matter. *Journal of Personality and Social Psychology, 70*(5), 1091-1102.

Swickert, R. J., Rosentreter, C. J., Hittner, J. B., & Mushrush, J. E. (2002). Extraversion, social support processes, and stress. *Personality and Individual Differences, 32*(5), 877-891.

Tabachnick, B. G., & Fidell, L. S. (2007). *Using Multivariate Statistics*(5th ed.). Boston, MA: Pearson Education, Inc.

Tamiya, N., Araki, S., Ohi, G., Inagaki, K., Urano, N., Hirano, W., et al. (2002). Assessment of pain, depression, and anxiety by visual analogue scale in Japanese women with rheumatoid arthritis. *Scandinavian Journal of Caring Sciences, 16*(2), 137-141.

Thomas, A., Buboltz, W. C., & Winkelspecht, C. S. (2004). Job characteristics and personality as predictors of job satisfaction. *International Journal of Organizational Analysis, 12*(2), 205-219.

Thompson, E. R. (2007). Development and validation of an internationally reliable short-form of the Positive and Negative Affect Schedule (PANAS). *Journal of Cross-Cultural Psychology, 38*(2), 227-242.

Tompkins, D. A., Bigelow, G. E., Harrison, J. A., Johnson, R. E., Fudala, P. J., & Strain, E. C. (2009). Concurrent validation of the Clinical Opiate Withdrawal Scale (COWS) and single-item indices against the Clinical Institute Narcotic Assessment (CINA) opioid withdrawal instrument. *Drug and Alcohol Dependence, Vol.105*(1-2), pp.

Tsutsumi, A., & Kawakami, N. (2004). A review of empirical studies on the model of effort-reward imbalance at work: reducing occupational stress by implementing a new theory. *Social science & medicine, 59*(11), 2335-2359.

Tully, A. (2004). Stress, sources of stress and ways of coping among psychiatric nursing students. *Journal of Psychiatric and Mental Health Nursing, 11*(1), 43-47.

Tyson, P. D., Pongruengphant, R., & Aggarwal, B. (2002). Coping with organizational stress among hospital nurses in Southern Ontario. *International Journal of Nursing Studies, 39*(4), 453-459.

Van Der Doef, M., & Maes, S. (1999). The Job Demand-Control(-Support) model and psychological well-being: A review of 20 years of empirical research. *Work and Stress, 13*(2), 87-114.

Van Saane, N., Sluiter, J., Verbeek, J., & Frings-Dresen, M. (2003). Reliability and validity of instruments measuring job satisfaction—a systematic review. *Occupational Medicine, 53*(3), 191-200.

Viswanathan, M., Bergen, M., Dutta, S., & Childers, T. (1996). Does a single response category in a scale completely capture a response? *Psychology and Marketing, 13*(5), 457-479.

Vitaliano, P. P., Russo, J., Carr, J. E., Maiuro, R. D., & Becker, J. (1985). The ways of coping checklist: Revision and psychometric properties. *Multivariate behavioral research, 20*(1), 3-26.

Waldron, S. (2010). Measuring subjective wellbeing in the UK. *Newport: Office for National Statistics*.

Wanous, J. P., & Hudy, M. J. (2001). Single-Item Reliability: A Replication and Extension. *Organizational Research Methods, 4*(4), 361-375.

Wanous, J. P., Reichers, A. E., & Hudy, M. J. (1997). Overall job satisfaction: How good are single-item measures? *Journal of Applied Psychology, 82*(2), 247-251.

Watkins, C. L., Lightbody, C. E., Sutton, C. J., Holcroft, L., Jack, C. I. A., Dickinson, H. A., et al. (2007). Evaluation of a single-item screening tool for depression after stroke: A cohort study. *Clinical Rehabilitation, 21*(9), 846-852.

Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: the PANAS scales. *Journal of Personality and Social Psychology, 54*(6), 1063.

WHO. (2004a). The world health report 2004. Changing history. Retrieved from http://www.who.int/whr/2004/en

WHO. (2012). *Measurement of and target-setting for well-being:an initiative by the WHO Regional Office for Europe*.

Wismar, M., McKee, M., Ernst, K., Srivastava, D., & Busse, R. (2013). Measurement of and target-setting for well-being: an initiative by the WHO Regional Office for Europe/Second meeting of the expert group Paris, France, 25-26 June 2012.

Witter, R. A., Okun, M. A., Stock, W. A., & Haring, M. J. (1984). Education and subjective well-being: A meta-analysis. *Educational Evaluation and Policy Analysis*, 165-173.

Woods, S. A., & Hampson, S. E. (2005). Measuring the big five with single items using a bipolar response scale. *European Journal of Personality, 19*(5), 373-390.

Yammarino, F. J., Skinner, S. J., & Childers, T. L. (1991). Understanding mail survey response behavior a meta-analysis. *Public Opinion Quarterly, 55*(4), 613-639.

Zigmond, A. S., & Snaith, R. P. (1983). The hospital anxiety and depression scale. *Acta Psychiatrica Scandinavica, 67*(6), 361-370.

Zimmerman, M., Ruggero, C. J., Chelminski, I., Young, D., Posternak, M. A., Friedman, M., et al. (2006). Developing brief scales for use in clinical practice: The reliability and validity of single-item self-report measures of depression symptom severity, psychosocial impairment due to depression, and quality of life. *Journal of Clinical Psychiatry, 67*(10), 1536-1541.

Appendices

Appendix 4.1: University staff study consent form
<u>Informed Consent</u>

I understand that my participation in this project will involve completing a questionnaire on aspects of my well-being in relation to my work experiences, self-perception, and mental and physical health, which will take approximately 1 hour of my time.

I understand that participation in this study is entirely voluntary and that I can withdraw from the study at any time without giving a reason and without loss of payment.

I understand that I am free to avoid responding to any questions that I feel uncomfortable answering and that I can discuss my concerns with Gary Williams or Professor Andy Smith at the email addresses below.

I understand that the information provided by me will be held totally anonymously, with my email address provided separately for payment purposes, so that it is impossible to trace my responses back to me individually. I understand that this information may be retained indefinitely.

I also understand that at the end of the study I will be provided with additional information and feedback about the purpose of the study.

By checking the box below and continuing, I consent to participate in the study conducted by Gary Williams (PhD student), School of Psychology, Cardiff University with the supervision of Professor Andy Smith.

I have read and understood the above statement and consent to participate.

☐

Contact Details

Researcher	Supervisor
Gary Williams (PhD Student)	Prof Andy Smith
School of Psychology	School of Psychology
Cardiff University	Cardiff University
63 Park Place	63 Park Place
Cardiff	Cardiff

CF10 3AS   CF10 3AS

Tel: 029 2087 6495   Tel: 029 2087 4757

email: williamsgm3@cf.ac.uk   email: smithap@cf.ac.uk

Appendix 4.2: University staff study instructions sheet

<u>Measuring well-being in University staff - Instructions</u>

Thank you for agreeing to participate in this study, the aim of which is to identify the important elements of well-being and compare the efficacy of short well-being measures to more detailed questionnaires. The following questionnaire which contains four main sections:

The first section requires you to complete short-form versions of questionnaires which may be referring to overall well-being, or some particular aspect of well-being (for example, job demands), followed by a longer well-being measure. Many of these questions will contain examples of what thoughts/behaviours the question is referring to which are important for understanding the focus of the question, but should be regarded as guidance rather than strict criteria.

The following three sections contain longer questionnaires related to your work life, followed by your self-perception and your physical health and health behaviours. It is important to read each question/statement carefully because it is common for scales or relevant timeframes to vary; this is especially important after a break in the page or on a new page.

We would like to request that you be as open and honest as possible with your responses and to avoid any perception of what you think a desirable answer might be. There are no right or wrong answers, but the reliability of the data depends on honest and accurate responding. Please also try to make sure you haven't inadvertently missed out any questions.

When you complete the questionnaire, your email address will be registered as completed for payment purposes, however your responses will not be traceable back to you and will be held totally anonymously. The questionnaire should take an hour to complete, and you will be paid £10 for this time, and entered for a £100 prize draw.

Finally, we remind you that you are free to withdraw from the study at any point, with no penalty, and that should you feel uncomfortable answering any of the questions that you are free to not respond to those questions.

Thank you again for your participation.

Appendix 4.3: University staff study questionnaire

Thank you for agreeing to complete this questionnaire, please

begin by responding to these simple demographic questions.

----

2. Age

(YEARS)

----

3. Sex

(1) Male

(2) Female

----

4. Current status

(1) Single

(2) Living with partner

(3) Married

(4) Separated

(5) Divorced

(6) Widowed

----

5. Education level

(1) None

(2) GCSE/'O' level

(3) AS level/SCE Higher/Matriculation

(4) City & Guilds/national diploma

(5) BA/BSc

(6) Higher degree/professional qualification

----

6. How would you describe yourself?

(1) White

(2) Black African

(3) Black Caribbean

(4) Black neither Caribbean or African

(5) Indian

(6) Pakistani

(7) Bangladeshi

(8) Chinese

(OTH) Other

----

7. What is the total current yearly amount you receive from your

   wage or annual salary (before tax is deducted)?

(1) 0 - 9,999

(2) 10,000 - 19,999

(3) 20,000 - 29,999

(4) 30,000 - 39,999

(5) 40,000 - 49,999

(6) 50,000 or more

The following sections contain short versions of the scales used

throughout the questionnaire. Please read each description and

the examples carefully, and state how much you agree or disagree

with each statement.

These questions relate to your experience at work

----

   1. I feel that I do not have the time I need to get my work
   done (for example: I am under constant time pressure,

   interrupted in my work, or overwhelmed by responsibilty or

   work demands)

Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly

----

2. I am satisfied with my relationships at work (for example: I get the respect I deserve from colleagues, I am treated

fairly, I receive support when I need it)

Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly

----

3. I feel that I have been rewarded for my efforts (for example: The respect, role, and job prospects I receive are

suitable for my efforts and achievements)

Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly

----

4. I feel that my work is too demanding (for example: I have to work very fast, I have to work very hard, I have conflicting

demands)

Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly

----

5. I feel that I get adequate control over my work (for example: I have a choice in what I do or how I do things, I

am able to learn new things, I am able to be creative)

Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly

----

6. I feel that I am supported by my colleagues (for example: there is a good atmosphere at work, I get along with my

colleagues, my colleagues understand me)

Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly

----

7. I feel that I have been subjected to bullying in the workplace in the past 12 months (for example: unjustified criticism, verbal/non-verbal threats, violence, humiliation or exclusion) ?

Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly

----

8. I feel that I am not consulted about changes at work (for example: There is no opportunity to question managers about change, I am unclear about how change will work out in practice).

Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly

----

9. I feel that I don't understand my role clearly (For example: I am not clear of what is expected of me and what tasks I need to perform)

Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly

----

10. I feel that I get along well with my supervisor (For example: I know where I stand in terms of their opinion of me, my supervisor understands me, my supervisor recognises my potential)

Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly

The next set of short questions are related to your feelings about yourself. Please try to be as honest and accurate as possible.

----

11. Thinking about myself and how I normally feel, in general, I mostly experience positive feelings (For example: I feel

alert, inspired, determined, attentive)

Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly

----

12. Thinking about myself and how I normally feel, in general, I mostly experience negative feelings (For example: I feel

upset, hostile, ashamed, nervous)

Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly

----

13. In general, I feel optimistic about the future (For example: I usually expect the best, I expect more good things to

happen to me than bad, It's easy for me to relax)

Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly

----

14. I am confident in my ability to solve problems that I might face in life (For example: I can usually handle whatever

comes my way, If I try hard enough I can overcome difficult

problems, I can stick to my aims and accomplish my goals)

Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly

----

15.   Overall, I feel that I have positive self-esteem (For

example: On the whole I am satisfied with myself, I am able

to do things as well as most other people, I feel that I am

a person of worth)

Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly

----

   16. Overall, I feel that I am satisfied with my life (For
example: In most ways my life is close to my ideal, so far I

have gotten the important things I want in life)

Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly

----

   17.   When I find myself in stressful situations I try to deal
with it in a pro-active way (For example: by taking one step

at a time, by changing something so that it would work out,

by learning from the situation, by asking someone for help)

Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly

----

   18. When I find myself in stressful situations I tend to look
inwardly (For example: I blame myself for the situation,

wish that I had the power to change what has happened, wish

the situation would go away, try to forget the whole thing)

Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly

The following section refers to positive experiences. In considering your responses, please try to imagine yourself experiencing a variety of positive outcomes (for example: a pay rise at work, a successful application, or a positive encounter with a friend).

1a. Do you believe that positive outcomes are more likely

the result of external factors (e.g. luck, other's

influence) or internal factors (e.g. effort, determination)?

Completely External 1 2 3 4 5 6 7 8 9 10 Completely Internal

1b. Do you believe that factors that currently influence

positive outcomes will also be important in the future?

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

1c. Do you believe that the same factors influence most

positive outcomes?

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

Now please do the same for this section, but try to imagine yourself experiencing a variety of negative outcomes (for example: a meeting goes badly, a friend lets you down, you fail

at a task).

2a. Do you believe that NEGATIVE outcomes are more likely

the result of external factors (e.g. luck, other's

influence) or internal factors (e.g. effort, determination)?

Completely External 1 2 3 4 5 6 7 8 9 10 Completely Internal

2b. Do you believe that factors that currently influence

negative outcomes will also be important in the future?

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

2c. Do you believe that the same factors influence most

negative outcomes?

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

----

1. I consider myself to be outgoing (For example: Talkative,
comfortable with myself, confident in social situations)

Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly

----

2. I feel that I have an agreeable nature (For example: I feel
sympathy toward people in need, I like being kind to people,

I'm co-operative)

Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly

----

3. I feel that I am a conscientious person (For example: I am always prepared, I make plans and stick to them, I pay

attention to details)

Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly

----

4.   I feel that I can get on well with others (For example: I'm usually relaxed around others, I tend not to get jealous, I

accept people as they are)

Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly

----

5. I feel that I am open to new ideas (For example: I enjoy philosophical discussion, I like to be imaginative, I like

to be creative)

Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly

----

6. On a scale of one to ten, how depressed would you say you are in general? (e.g. feeling 'down', no longer looking

forward to things or enjoying things that you used to)

Not at all depressed 1 2 3 4 5 6 7 8 9 10 Extremely depressed

----

7. On a scale of one to ten, how anxious would you say you are in general? (e.g. feeling tense or 'wound up', unable to

relax, feelings of worry or panic)

Not at all anxious 1 2 3 4 5 6 7 8 9 10 Extremely anxious

----

8. In general, how stressful do you find your job?

(1) Not at all stressful

(2) Mildly stressful

(3) Moderately stressful

(4) Very stressful

(5) Extremely stressful

Please answer the following questions in relation to your

current job.

Do you work at night?

(1) Never/almost never

(2) Seldom

(3) Sometimes

(4) Often

Do you do shift work?

(1)

(2)

(3)

(4)

Do you have to work long or unsociable hours?

(1)

(2)

(3)

(4)

Do you have to be "on call" for work?

(1)

(2)

(3)

(4)

Do you have unpredictable working hours?

(1)

(2)

(3)

(4)

Does your job ever expose you to breathing fumes, dusts or

    other potentially harmful substances?

(1)

(2)

(3)

(4)

Does your job ever require you to handle or touch

    potentially harmful substances or materials?

(1)

(2)

(3)

(4)

Do you ever have work tasks that leave you with a ringing

    in your ears or a temporary feeling of deafness?

(1)

(2)

(3)

(4)

Do you work in an environment where the level of background

   noise distubs your concentration?

(1)

(2)

(3)

(4)

Do you work full-time or part-time?

(1) Part-time

(2) Full-time

What is your work pattern?

(1) Fixed hours

(2) Flexi-time

(3) Shift work

Is your job permanent, temporary/casual, or fixed contract?

(1) Permanent

(2) Temporary/casual

(3) Fixed contract

The following statements relate to your experience at work.
Please read each statement carefully and indicate whether you
agree or disagree that the item content describes a typical
experience of your work situation. Please then indicate (on the
scale on the right side of the page) to what extent you usually
feel distressed by this typical experience.

I have constant time pressure due to a heavy work load

(1) Agree

(2) Disagree

----

(1) Not distressed

(2) Somewhat distressed

(3) Distressed

(4) Very distressed

I have many interruptions and disturbances in my job

(1) Agree

(2) Disagree

----

(1) Not distressed

(2) Somewhat distressed

(3) Distressed

(4) Very distressed

I have a lot of responsibility in my job

(1) Agree

(2) Disagree

----

(1) Not distressed

(2) Somewhat distressed

(3) Distressed

(4) Very distressed

I am often pressured to work overtime

(1) Agree

(2) Disagree

----

(1) Not distressed

(2) Somewhat distressed

(3) Distressed

(4) Very distressed

 Over the past few years, my job has become more and more

    demanding.

(1) Agree

(2) Disagree

     ----

(1) Not distressed

(2) Somewhat distressed

(3) Distressed

(4) Very distressed

I receive the respect I deserve from my superiors

(1) Agree

(2) Disagree

     ----

(1) Not distressed

(2) Somewhat distressed

(3) Distressed

(4) Very distressed

I receive the respect I deserve from my colleagues

(1) Agree

(2) Disagree

----

(1) Not distressed

(2) Somewhat distressed

(3) Distressed

(4) Very distressed

I experience adequate support in difficult situations

(1) Agree

(2) Disagree

----

(1) Not distressed

(2) Somewhat distressed

(3) Distressed

(4) Very distressed

I am treated unfairly at work

(1) Agree

(2) Disagree

----

(1) Not distressed

(2) Somewhat distressed

(3) Distressed

(4) Very distressed

Considering all my efforts and achievements, I receive the

    respect and prestige I deserve at work

(1) Agree

(2) Disagree

----

(1) Not distressed

(2) Somewhat distressed

(3) Distressed

(4) Very distressed

My job promotion prospects are poor.

(1) Agree

(2) Disagree

    ----

(1) Not distressed

(2) Somewhat distressed

(3) Distressed

(4) Very distressed

My current occupational position adequately reflects my

education and training

(1) Agree

(2) Disagree

----

(1) Not distressed

(2) Somewhat distressed

(3) Distressed

(4) Very distressed

Considering all my efforts and achievements, my work

prospects are adequate.

(1) Agree

(2) Disagree

----

(1) Not distressed

(2) Somewhat distressed

(3) Distressed

(4) Very distressed

 Considering all my efforts and achievements, my salary/

   income is adequate.

(1) Agree

(2) Disagree

   ----

(1) Not distressed

(2) Somewhat distressed

(3) Distressed

(4) Very distressed

 I have experienced or I expect to experience an undesirable

   change in my work situation.

(1) Agree

(2) Disagree

   ----

(1) Not distressed

(2) Somewhat distressed

(3) Distressed

(4) Very distressed

  My job security is poor.

(1) Agree

(2) Disagree

    ----

(1) Not distressed

(2) Somewhat distressed

(3) Distressed

(4) Very distressed

For the following section please state how much you agree or

disagree with each statement.

  I get easily overwhelmed by time pressures at work.

(1) Strongly disagree

(2) Disagree

(3) Agree

(4) Strongly agree

  As soon as I get up in the morning I start thinking about

    work problems.

(1) Strongly disagree

(2) Disagree

(3) Agree

(4) Strongly agree

  When I get home, I can easily relax and 'switch off' work.

(1) Strongly disagree

(2) Disagree

(3) Agree

(4) Strongly Agree

 People close to me say I sacrifice too much for my job.

(1) Strongly disagree

(2) Disagree

(3) Agree

(4) Strongly agree

Work rarely lets me go, it is still on my mind when I go to

bed.

(1) Strongly disagree

(2) Disagree

(3) Agree

(4) Strongly agree

If I postpone something that I was supposed to do today

I'll have trouble sleeping at night.

(1) Strongly disagree

(2) Disagree

(3) Agree

(4) Strongly agree

The next section refers to the particular characteristics of

your job. Please read each item carefully and select the most

accurate response for each.

Does your job require you to work very fast?

(1) Never

(2) Seldom

(3) Sometimes

(4) Often

Does your job require you to work very hard?

(1) Never

(2) Seldom

(3) Sometimes

(4) Often

Does your job require too great a work effort?

(1) Never

(2) Seldom

(3) Sometimes

(4) Often

Do you have sufficient time for all your work tasks?

(1) Never

(2) Seldom

(3) Sometimes

(4) Often

Do conflicting demands often occur in your work?

(1) Never

(2) Seldom

(3) Sometimes

(4) Often

Do you have the opportunity to learn new things in your

work?

(1) Never

(2) Seldom

(3) Sometimes

(4) Often

Does your job require creativity?

(1) Never

(2) Seldom

(3) Sometimes

(4) Often

Does your job require doing the same tasks over and over

again?

(1) Never

(2) Seldom

(3) Sometimes

(4) Often

Do you have the possibility to decide for yourself how to

carry out your work?

(1) Never

(2) Seldom

(3) Sometimes

(4) Often

Do you have the possibility to decide for yourself what

   should be done in your work?

(1) Never

(2) Seldom

(3) Sometimes

(4) Often

There is a quiet and pleasant atmosphere at my place of

   work

(1) Strongly disagree

(2) Somewhat disagree

(3) Somewhat agree

(4) Strongly agree

There is good collegiality at work

(1) Strongly disagree

(2) Somewhat disagree

(3) Somewhat agree

(4) Strongly agree

My co-workers (colleagues) are there for me (support me)

(1) Strongly disagree

(2) Somewhat disagree

(3) Somewhat agree

(4) Strongly agree

People at work understand that I may have a "bad" day

(1) Strongly disagree

(2) Somewhat disagree

(3) Somewhat agree

(4) Strongly agree

I get along well with my supervisors

(1) Strongly disagree

(2) Somewhat disagree

(3) Somewhat agree

(4) Strongly agree

I get along well with my co-workers

(1) Strongly disagree

(2) Somewhat disagree

(3) Somewhat agree

(4) Strongly agree

In this section, please indicate whether or not you have been persistently subjected to any of the following behaviours at work, in the past 12 months.

Persistent attempts to belittle and undermine your work

(1) Yes

(2) No

Persistent and unjustified criticism and monitoring of your

work

(1) Yes

(2) No

Persistent attempts to humiliate you in front of colleagues

(1) Yes

(2) No

Intimidatory use of discipline or competence procedures

(1) Yes

(2) No

Undermining your personal integrity

(1) Yes

(2) No

Destructive innuendo and sarcasm

(1) Yes

(2) No

Verbal and non-verbal threats

(1) Yes

(2) No

Making inappropriate jokes about you

(1) Yes

(2) No

Persistent teasing

(1) Yes

(2) No

Physical violence

(1) Yes

(2) No

 Violence to property

(1) Yes

(2) No

 Withholding necessary information from you

(1) Yes

(2) No

 Freezing out, ignoring, or excluding

(1) Yes

(2) No

 Unreasonable refusal of applications for leave, training,

   or promotion

(1) Yes

(2) No

 Undue pressure to produce work

(1) Yes

(2) No

 Setting of impossible deadline

(1) Yes

(2) No

 Shifting of goal posts without telling you

(1) Yes

(2) No

 Constant undervaluing of your efforts

(1) Yes

(2) No

  Persistent attempts to demoralise you

(1) Yes

(2) No

  Removal of areas of responsibility without consultation

(1) Yes

(2) No

It is recognised that working conditions affect worker well-

being. Please respond to the following statements in a way that

reflects your work over the past six months.

  I am clear what is expected of me at work

(1) Never

(2) Seldom

(3) Sometimes

(4) Often

(5) Always

I can decide when to take a break

(1) Never

(2) Seldom

(3) Sometimes

(4) Often

(5) Always

Different groups at work demand things from me that are

hard to combine

(1) Never

(2) Seldom

(3) Sometimes

(4) Often

(5) Always

I know how to go about getting my job done

(1) Never

(2) Seldom

(3) Sometimes

(4) Often

(5) Always

I am subject to personal harassment in the form of unkind

words or behaviour

(1) Never

(2) Seldom

(3) Sometimes

(4) Often

(5) Always

I have unachievable deadlines

(1) Never

(2) Seldom

(3) Sometimes

(4) Often

(5) Always

If work gets difficult, my colleagues will help me

(1) Never

(2) Seldom

(3) Sometimes

(4) Often

(5) Always

I am given supportive feedback on the work I do

(1) Never

(2) Seldom

(3) Sometimes

(4) Often

(5) Always

I have to work very intensively

(1) Never

(2) Seldom

(3) Sometimes

(4) Often

(5) Always

I have a say in my own work speed

(1) Never

(2) Seldom

(3) Sometimes

(4) Often

(5) Always

I am clear what my duties and responsibilites are

(1) Never

(2) Seldom

(3) Sometimes

(4) Often

(5) Always

I have to neglect some tasks because I have too much to do

(1) Never

(2) Seldom

(3) Sometimes

(4) Often

(5) Always

I am clear about the goals and objectives for my department

(1) Never

(2) Seldom

(3) Sometimes

(4) Often

(5) Always

There is friction or anger between colleagues

(1) Never

(2) Seldom

(3) Sometimes

(4) Often

(5) Always

I have a choice in deciding how I do my work

(1) Never

(2) Seldom

(3) Sometimes

(4) Often

(5) Always

 I am unable to take sufficient breaks

(1) Never

(2) Seldom

(3) Sometimes

(4) Often

(5) Always

 I understand how my work fits into the overall aim of the

   organisation

(1) Never

(2) Seldom

(3) Sometimes

(4) Often

(5) Always

 I am pressured to work long hours

(1) Never

(2) Seldom

(3) Sometimes

(4) Often

(5) Always

I have a choice in deciding what I do at work

(1) Never

(2) Seldom

(3) Sometimes

(4) Often

(5) Always

I have to work very fast

(1) Never

(2) Seldom

(3) Sometimes

(4) Often

(5) Always

I am subject to bullying at work

(1) Never

(2) Seldom

(3) Sometimes

(4) Often

(5) Always

I have unrealistic time pressures

(1) Never

(2) Seldom

(3) Sometimes

(4) Often

(5) Always

I can rely on my line manager to help me out with a work

problem

(1) Never

(2) Seldom

(3) Sometimes

(4) Often

(5) Always

 I get help and support I need from colleagues

(1) Never

(2) Seldom

(3) Sometimes

(4) Often

(5) Always

 I have some say over the way I work

(1) Never

(2) Seldom

(3) Sometimes

(4) Often

(5) Always

 I have sufficient opportunities to question managers about

   change at work

(1) Never

(2) Seldom

(3) Sometimes

(4) Often

(5) Always

I receive the respect at work I deserve from my colleagues

(1) Never

(2) Seldom

(3) Sometimes

(4) Often

(5) Always

Staff are always consulted about change at work

(1) Never

(2) Seldom

(3) Sometimes

(4) Often

(5) Always

I can talk to my line manager about something that has

upset or annoyed me about work

(1) Never

(2) Seldom

(3) Sometimes

(4) Often

(5) Always

My working time can be flexible

(1) Never

(2) Seldom

(3) Sometimes

(4) Often

(5) Always

My colleagues are willing to listen to my work related

problems

(1) Never

(2) Seldom

(3) Sometimes

(4) Often

(5) Always

When changes are made at work, I am clear how they will

work out in practice

(1) Never

(2) Seldom

(3) Sometimes

(4) Often

(5) Always

I am supported through emotionally demanding work

(1) Never

(2) Seldom

(3) Sometimes

(4) Often

(5) Always

Relationships at work are strained

(1) Never

(2) Seldom

(3) Sometimes

(4) Often

(5) Always

My line manager encourages me at work

(1) Never

(2) Seldom

(3) Sometimes

(4) Often

(5) Always

The following questions relate to your relationship with your

supervisor:

Do you usually feel that you know where you stand (do you

usually know how satisfied your immediate supervisor is

with what you do)?

(1) Always know where I stand

(2) Usually know where I stand

(3) Seldom know where I stand

(4) Never know where I stand

How well do you feel that your immediate supervisor

understands your problems and needs?

(1) Completely

(2) Well enough

(3) Some but not enough

(4) Not at all

How well do you feel that your immediate supervisor

recognizes your potential?

(1) Fully

(2) As much as the next person

(3) Some but not enough

(4) Not at all

Regardless of how much formal authority your immediate

supervisor has built into his or her position, what are the

chances that he or she would be personally inclined to use

power to help you solve problems in your work?

(1) Certainly would

(2) Probably Would

(3) Might or might not

(4) No chance

Again, regardless of the amount of formal authority your

immediate supervisor has, to what extent can you count on

him or her to "bail you out" at his or her expense when you

really need it?

(1) Certainly would

(2) Probably would

(3) Might or might not

(4) No chance

I have enough confidence in my immediate supervisor that I

would defend and justify his or her decisions if he or she

were not present to do so

(1) Certainly would

(2) Probably would

(3) Maybe

(4) Probably not

  How would you characterize your working relationship with

   your immediate supervisor?

(1) Extremely effective

(2) Better than average

(3) About average

(4) Less than average

Thank you for completing the section of the questionnaire

related to your workplace. The following few sections are

related to your personal appraisal. Please be as honest as you

can throughout, and try not to let your responses to one

question influence your response to other questions. There are

no right or wrong answers.

Thinking about yourself and how you normally feel, to what

extent do you generally feel:

UPSET:

Never 1 2 3 4 5 Always

HOSTILE:

Never 1 2 3 4 5 Always

ALERT:

Never 1 2 3 4 5 Always

ASHAMED:

Never 1 2 3 4 5 Always

INSPIRED:

Never 1 2 3 4 5 Always

NERVOUS:

Never 1 2 3 4 5 Always

----

246. Thinking about yourself and how you normally feel, to what

extent do you generally feel:

DETERMINED

Never 1 2 3 4 5 Always

ATTENTIVE:

Never 1 2 3 4 5 Always

AFRAID:

Never 1 2 3 4 5 Always

ACTIVE:

Never 1 2 3 4 5 Always

  In uncertain times, I usually expect the best

(1) Strongly disagree

(2) Disagree

(3) Neutral

(4) Agree

(5) Strongly agree

  It's easy for me to relax

(1) Strongly disagree

(2) Disagree

(3) Neutral

(4) Agree

(5) Strongly agree

If something can go wrong for me, it will

(1) Strongly disagree

(2) Disagree

(3) Neutral

(4) Agree

(5) Strongly agree

I'm always optimistic about my future

(1) Strongly disagree

(2) Disagree

(3) Neutral

(4) Agree

(5) Strongly agree

I enjoy my friends a lot

(1) Strongly disagree

(2) Disagree

(3) Neutral

(4) Agree

(5) Strongly Agree

  It's important for me to keep busy

(1) Strongly disagree

(2) Disagree

(3) Neutral

(4) Agree

(5) Strongly agree

  I hardly ever expect things to go my way

(1) Strongly disagree

(2) Disagree

(3) Neutral

(4) Agree

(5) Strongly agree

  I don't get upset too easily

(1) Strongly disagree

(2) Disagree

(3) Neutral

(4) Agree

(5) Strongly agree

  I rarely count on good things happening to me

(1) Strongly disagree

(2) Disagree

(3) Neutral

(4) Agree

(5) Strongly agree

  Overall, I expect more good things to happen to me than bad

(1) Strongly disagree

(2) Disagree

(3) Neutral

(4) Agree

(5) Strongly agree

Below is a list of statements about your feelings of self-

efficacy. Please indicate how true you think each statement is

about you.

I can always manage to solve difficult problems if I try

   hard enough

(1) Not at all true

(2) Hardly true

(3) Moderately true

(4) Exactly true

If someone opposes me, I can find the means and ways to get

   what I want

(1) Not at all true

(2) Hardly true

(3) Moderately true

(4) Exactly true

It is easy for me to stick to my aims and accomplish my

   goals

(1) Not at all true

(2) Hardly true

(3) Moderately true

(4) Exactly true

I am confident that I could deal efficiently with

unexpected events

(1) Not at all true

(2) Hardly true

(3) Moderately true

(4) Exactly true

Thanks to my resourcefulness, I know how to handle

unforeseen situations

(1) Not at all true

(2) Hardly true

(3) Moderately true

(4) Exactly true

I can solve most problems if I invest the necessary effort

(1) Not at all true

(2) Hardly true

(3) Moderately true

(4) Exactly true

 I can remain calm when facing difficulties because I can

   rely on my coping abilities

(1) Not at all true

(2) Hardly true

(3) Moderately true

(4) Exactly true

 When I am confronted with a problem, I can usually find

   several solutions

(1) Not at all true

(2) Hardly true

(3) Moderately true

(4) Exactly true

 If I am in trouble, I can usually think of a solution

(1) Not at all true

(2) Hardly true

(3) Moderately true

(4) Exactly true

I can usually handle whatever comes my way

(1) Not at all true

(2) Hardly true

(3) Moderately true

(4) Exactly true

Below is a list of statements dealing with your general feelings

about yourself. Please read each statement carefully and

indicate how much you agree or disagree with each.

On the whole, I am satisfied with myself

(1) Strongly disagree

(2) Disagree

(3) Agree

(4) Strongly agree

At times, I think I am no good at all

(1) Strongly disagree

(2) Disagree

(3) Agree

(4) Strongly agree

I feel that I have a number of good qualities

(1) Strongly disagree

(2) Disagree

(3) Agree

(4) Strongly agree

I am able to do things as well as most other people

(1) Strongly disagree

(2) Disagree

(3) Agree

(4) Strongly agree

I feel I do not have much to be proud of

(1) Strongly disagree

(2) Disagree

(3) Agree

(4) Strongly agree

I certainly feel useless at times

(1) Strongly disagree

(2) Disagree

(3) Agree

(4) Strongly agree

I feel that I'm a person of worth, at least on an equal

plane with others

(1) Strongly disagree

(2) Disagree

(3) Agree

(4) Strongly agree

I wish I could have more respect for myself

(1) Strongly disagree

(2) Disagree

(3) Agree

(4) Strongly agree

All in all, I am inclined to feel that I am a failure

(1) Strongly disagree

(2) Disagree

(3) Agree

(4) Strongly agree

I take a positive attitude toward myself

(1) Strongly disagree

(2) Disagree

(3) Agree

(4) Strongly agree

Below are five statements that you may agree or disagree with.

Indicate your agreement with each item on the given scales.

Please be open and honest in your responding.

  In most ways my life is close to my ideal

(1) Strongly disagree

(2) Disagree

(3) Slightly disagree

(4) Neither agree nor disagree

(5) Slightly agree

(6) Agree

(7) Strongly agree

  The conditions of my life are excellent

(1) Strongly disagree

(2) Disagree

(3) Slightly disagree

(4) Neither agree nor disagree

(5) Slightly agree

(6) Agree

(7) Strongly agree

I am satisfied with my life

(1) Strongly disagree

(2) Disagree

(3) Slightly disagree

(4) Neither agree nor disagree

(5) Slightly agree

(6) Agree

(7) Strongly agree

So far I have gotten the important things I want in life

(1) Strongly disagree

(2) Disagree

(3) Slightly disagree

(4) Neither agree nor disagree

(5) Slightly agree

(6) Agree

(7) Strongly agree

If I could live my life over, I would change almost nothing

(1) Strongly disagree

(2) Disagree

(3) Slightly disagree

(4) Neither agree nor disagree

(5) Slightly agree

(6) Agree

(7) Strongly agree

For the following section, please try and remember a stressful situation that you have experienced at work in the last two months. If you can't think of a work situation please think of another situation. Now please read each of the following items and indicate how much you used each approach described to try and deal with the stress and to make yourself feel better.

  Bargained or compromised to get something positive from the
    situation.

(1) Not at all

(2) Sometimes

(3) Often

(4) All the time

Concentrated on something good that could come out of the

whole thing.

(1) Not at all

(2) Sometimes

(3) Often

(4) All the time

Tried not to burn my bridges behind me, but left things

open somewhat.

(1) Not at all

(2) Sometimes

(3) Often

(4) All the time

Changed or grew as a person in a good way.

(1) Not at all

(2) Sometimes

(3) Often

(4) All the time

Made a plan of action and followed it.

(1) Not at all

(2) Sometimes

(3) Often

(4) All the time

Accepted the next best thing to what I wanted.

(1) Not at all

(2) Sometimes

(3) Often

(4) All the time

Came out of the experience better than when I went in.

(1) Not at all

(2) Sometimes

(3) Often

(4) All the time

Tried not to act too hastily or follow my own hunch.

(1) Not at all

(2) Sometimes

(3) Often

(4) All the time

Changed something so things would turn out all right.

(1) Not at all

(2) Sometimes

(3) Often

(4) All the time

Just took things one step at a time.

(1) Not at all

(2) Sometimes

(3) Often

(4) All the time

I knew what had to be done, so I doubled my efforts and

tried harder to make things work.

(1) Not at all

(2) Sometimes

(3) Often

(4) All the time

Came up with a couple of different solutions to the

problem.

(1) Not at all

(2) Sometimes

(3) Often

(4) All the time

Accepted my strong feelings, but didn't let them interfere

with other things too much.

(1) Not at all

(2) Sometimes

(3) Often

(4) All the time

Changed something about myself so I could deal with the

situation better.

(1) Not at all

(2) Sometimes

(3) Often

(4) All the time

Stood my ground and fought for what I wanted.

(1) Not at all

(2) Sometimes

(3) Often

(4) All the time

Talked to someone to find out about the situation.

(1) Not at all

(2) Sometimes

(3) Often

(4) All the time

Accepted sympathy and understanding from someone.

(1) Not at all

(2) Sometimes

(3) Often

(4) All the time

Got professional help and did what they recommended.

(1) Not at all

(2) Sometimes

(3) Often

(4) All the time

Talked to someone who could do something about the problem.

(1) Not at all

(2) Sometimes

(3) Often

(4) All the time

Asked someone I respected for advice and followed it.

(1) Not at all

(2) Sometimes

(3) Often

(4) All the time

Talked to someone about how I was feeling.

(1) Not at all

(2) Sometimes

(3) Often

(4) All the time

Blamed yourself.

(1) Not at all

(2) Sometimes

(3) Often

(4) All the time

Criticized or lectured yourself.

(1) Not at all

(2) Sometimes

(3) Often

(4) All the time

Realized you brought the problem on yourself.

(1) Not at all

(2) Sometimes

(3) Often

(4) All the time

Hoped a miracle would happen.

(1) Not at all

(2) Sometimes

(3) Often

(4) All the time

Wished I was a stronger person -- more optimistic and

forceful.

(1) Not at all

(2) Sometimes

(3) Often

(4) All the time

 Wished that I could change what had happened.

(1) Not at all

(2) Sometimes

(3) Often

(4) All the time

 Wished I could change the way I felt.

(1) Not at all

(2) Sometimes

(3) Often

(4) All the time

 Daydreamed or imagined a better time or place than the one

   I was in.

(1) Not at all

(2) Sometimes

(3) Often

(4) All the time

Had fantasies or wishes about how things might turn out.

(1) Not at all

(2) Sometimes

(3) Often

(4) All the time

Thought about fantastic or unreal things (like perfect

revenge or finding a million pounds) that made me feel

better.

(1) Not at all

(2) Sometimes

(3) Often

(4) All the time

Wished the situation would go away or somehow be finished.

(1) Not at all

(2) Sometimes

(3) Often

(4) All the time

Went on as if nothing had happened.

(1) Not at all

(2) Sometimes

(3) Often

(4) All the time

Felt bad that I couldn't avoid the problem.

(1) Not at all

(2) Sometimes

(3) Often

(4) All the time

Kept my feelings to myself.

(1) Not at all

(2) Sometimes

(3) Often

(4) All the time

Slept more than usual.

(1) Not at all

(2) Sometimes

(3) Often

(4) All the time

Got mad at the people or things that caused the problem.

(1) Not at all

(2) Sometimes

(3) Often

(4) All the time

Tried to forget the whole thing.

(1) Not at all

(2) Sometimes

(3) Often

(4) All the time

 Tried to make myself feel better by eating, drinking,

   smoking, taking medications.

(1) Not at all

(2) Sometimes

(3) Often

(4) All the time

 Avoided being with people in general.

(1) Not at all

(2) Sometimes

(3) Often

(4) All the time

 Kept others from knowing how bad things were.

(1) Not at all

(2) Sometimes

(3) Often

(4) All the time

  Refused to believe it had happened.

(1) Not at all

(2) Sometimes

(3) Often

(4) All the time

Please try to imagine yourself in the following situations. Then

look at the example causes given in part a) and indicate on the

scale how much you agree with the suggested cause (1 = totally

agree with the left side comment, 7 = totally with the right, 4

= both equally likely, or any number in between that matches

your feeling). Then for that same cause answer parts b) and c)

marking the appropriate circle.

1a) A friend at work compliments you on your appearance. Is
the cause likely to be due to:

(1) Your friend being polite

(2)

(3)

(4) or

(5)

(6)

(7) You looking good

----

b) In similar situations in the future how likely is it
that this explanation will again be true:

(1) Will rarely be true

(2)

(3)

(4) or

(5)

(6)

(7) Will often be true

----

  c) does this explanation have an influence on just this

    situation, or does it affect other situations:

(1) Influences just this situation

(2)

(3)

(4) or

(5)

(6)

(7) Influences many other situations

  2a) You have been looking for a job unsuccessfully for some

    time. Is this likely to be due to:

(1) A bad job market

(2)

(3)

(4) or

(5)

(6)

(7) You needing more skills/experience

----

b) In similar situations in the future how likely is it

that this explanation will again be true:

(1) Will rarely be true

(2)

(3)

(4) or

(5)

(6)

(7) Will often be true

----

c) Does this explanation have an influence on just this

situation, or does it affect other situations:

(1) Influences just this situation

(2)

(3)

(4) or

(5)

(6)

(7) Influences many other situations

3a) You become very successful and well-paid. Is this

likely to be due to:

(1) You having good luck

(2)

(3)

(4) or

(5)

(6)

(7) Hard work and determination

----

  b) In similar situations in the future how likely is it

    that this explanation will again be true:

(1) Will rarely be true

(2)

(3)

(4) or

(5)

(6)

(7) Will often be true

----

  c) Does this explanation have an influence on just this

    situation, or does it affect other situations:

(1) Influences just this situation

(2)

(3)

(4) or

(5)

(6)

(7) Influences many other situations

  4a) You go to a colleague for help but they don't help you.

    Is this likely to be due to:

(1) Them being too busy

(2)

(3)

(4) or

(5)

(6)

(7) You not being a good enough friend

----

  b) In similar situations in the future how likely is it

    that this explanation will again be true:

(1) Will rarely be true

(2)

(3)

(4) or

(5)

(6)

(7) Will often be true

----

 c) Does this explanation have an influence on just this

    situation, or does it affect other situations:

(1) Influences just this situation

(2)

(3)

(4) or

(5)

(6)

(7) Influences many other situations

 5a) You give a talk in front of co-workers but they react

    negatively. Is this likely to be due to:

(1) Them being impatient and busy

(2)

(3)

(4) or

(5)

(6)

(7) You being poorly prepared

----

  b) In similar situations in the future how likely is it

     that this explanation will again be true:

(1) Will rarely be true

(2)

(3)

(4) or

(5)

(6)

(7) Will often be true

----

  c) Does this explanation have an influence on just this

     situation, or does it affect other situations:

(1) Influences just this situation

(2)

(3)

(4) or

(5)

(6)

(7) Influences many other situations

  6a) You do something at work which is highly praised. Is

    this likely to be due to:

(1) The work being easy

(2)

(3)

(4) or

(5)

(6)

(7) Your hard work and effort

----

  b) In similar situations in the future how likely is it

    that this explanation will again be true:

(1) Will rarely be true

(2)

(3)

(4) or

(5)

(6)

(7) Will often be true

----

  c) Does this explanation have an influence on just this

    situation, or does it affect other situations:

(1) Influences just this situation

(2)

(3)

(4) or

(5)

(6)

(7) Influences many other situations

  7a) A colleague you like acts in a hostile way towards you.

    Is this likely to be due to:

(1) Them being in a bad mood

(2)

(3)

(4) or

(5)

(6)

(7) You annoying them

----

  b) In similar situations in the future how likely is it

    that this explanation will again be true:

(1) Will rarely be true

(2)

(3)

(4) or

(5)

(6)

(7) Will often be true

----

  c) Does this explanation have an influence on just this

    situation, or does it affect other situations:

(1) Influences just this situation

(2)

(3)

(4) or

(5)

(6)

(7) Influences many other situations

8a) You can't get all the work done that others expect of

you. Is this likely to be due to:

(1) You being given too much work

(2)

(3)

(4) or

(5)

(6)

(7) Your lack of time planning

----

b) In similar situations in the future how likely is it

that this explanation will again be true:

(1) Will rarely be true

(2)

(3)

(4) or

(5)

(6)

(7) Will often be true

----

  c) Does this explanation have an influence on just this

     situation, or does it affect other situations:

(1) Influences just this situation

(2)

(3)

(4) or

(5)

(6)

(7) Influences many other situations

  9a) A colleague buys you a present. Is this likely to be

     due to:

(1) Him/Her being in a good mood

(2)

(3)

(4) or

(5)

(6)

(7) You having been extra nice to them

----

b) In similar situations in the future how likely is it

    that this explanation will again be true:

(1) Will rarely be true

(2)

(3)

(4) or

(5)

(6)

(7) Will often be true

----

c) Does this explanation have an influence on just this

    situation, or does it affect other situations:

(1) Influences just this situation

(2)

(3)

(4) or

(5)

(6)

(7) Influences many other situations

10a) You apply for a promotion that you want and you get

it. Is this likely to be due to:

(1) Lack of other qualified applicants

(2)

(3)

(4) or

(5)

(6)

(7) The strength of your application/CV

----

b) In similar situations in the future how likely is it

that this explanation will again be true:

(1) Will rarely be true

(2)

(3)

(4) or

(5)

(6)

(7) Will often be true

----

c) Does this explanation have an influence on just this

situation, or does it affect other situations:

(1) Influences just this situation

(2)

(3)

(4) or

(5)

(6)

(7) Influences many other situations

11a) A meeting goes badly with a superior you wanted to

impress. Is this likely to be due to:

(1) The other person having a bad day

(2)

(3)

(4) or

(5)

(6)

(7) Them being unimpressed with you

----

b) In similar situations in the future how likely is it

that this explanation will again be true:

(1) Will rarely be true

(2)

(3)

(4) or

(5)

(6)

(7) Will often be true

----

  c) Does this explanation have an influence on just this

    situation, or does it affect other situations:

(1) Influences just this situation

(2)

(3)

(4) or

(5)

(6)

(7) Influences many other situations

12a) You get a raise. Is this likely to be due to:

(1) Everyone getting a raise

(2)

(3)

(4) or

(5)

(6)

(7) Your hard work and commitment

----

  b) In similar situations in the future how likely is it

    that this explanation will again be true:

(1) Will rarely be true

(2)

(3)

(4) or

(5)

(6)

(7) Will often be true

----

  c) Does this explanation have an influence on just this

    situation, or does it affect other situations:

(1) Influences just this situation

(2)

(3)

(4) or

(5)

(6)

(7) Influences many other situations

Please use this list of common human traits to describe yourself

as accurately as possible. Describe yourself as you see yourself

at the present time, not as you wish to be in the future.

Describe yourself as you are generally or typically, as compared

with other persons you know of the same sex and of roughly your

same age. Underneath each trait, please write a number

indicating how accurately that trait describes you, using the

following rating scale: 1 = Extremely Inaccurate | 2 = Very

Inaccurate | 3 = Moderately Inaccurate | 4 = Slightly Inaccurate

| 5 = Neither Inaccurate nor Accurate | 6 = Slightly Accurate |

7 = Moderately Accurate | 8 = Very Accurate | 9 = Extremely

Accurate

 Bold

 Systematic

Moody

Organised

Bashful

Energetic

Careless

Extraverted

Philosophical

Temperamental

Cold

Talkative

Quiet

Fretful

Practical

Touchy

Harsh

Uncreative

Imaginative

Envious

Complex

Cooperative

Relaxed

Unenvious

Inefficient

Creative

Rude

Unintellectual

Deep

Intellectual

Warm

Disorganised

Sloppy

Unsympathetic

Shy

Jealous

Sympathetic

Kind

Withdrawn

Efficient

The following section of questions is related to your mental and

physical health:

Please read the following statements and replies carefully and

select the reply that most accurately represents how you

currently feel. Try to give an immediate response, as this will

likely be more accurate than thinking about it for too long.

Notice that the scale differs for each question

  I feel tense or wound up

(1) Most of the time

(2) A lot of the time

(3) From time to time, occasionally

(4) Not at all

  I still enjoy the things I used to enjoy

(1) Definitely as much

(2) Not quite so much

(3) Only a little

(4) Hardly at all

  I get a sort of frightened feeling as if something awful is

    about to happen

(1) Very definitely and quite badly

(2) Yes, but not too badly

(3) A little, but it doesn't worry me

(4) Not at all

I can laugh and see the funny side of things

(1) As much as I always could

(2) Not quite so much now

(3) Definitely not so much now

(4) Not at all

Worrying thoughts go through my mind

(1) A great deal of the time

(2) A lot of the time

(3) From time to time, but not too often

(4) Only occasionally

I feel cheerful

(1) Not at all

(2) Not often

(3) Sometimes

(4) Most of the time

I can sit at ease and feel relaxed

(1) Definitely

(2) Usually

(3) Not often

(4) Not at all

I feel as if I am slowed down

(1) Nearly all the time

(2) Very often

(3) Sometimes

(4) Not at all

I get a sort of frightened feeling like 'butterflies' in

the stomach

(1) Not at all

(2) Occasionally

(3) Quite often

(4) Very often

I have lost interest in my appearance

(1) Definitely

(2) I don't take as much care as I used to

(3) I may not take quite as much care

(4) I take just as much care as ever

I feel restless as if I have to be on the move

(1) Very much indeed

(2) Quite a lot

(3) Not very much

(4) Not at all

I look forward with enjoyment to things

(1) As much as I ever did

(2) Rather less than I used to

(3) Definitely less than I used to

(4) Hardly at all

I get sudden feelings of panic

(1) Very often indeed

(2) Quite often

(3) Not very often

(4) Not at all

  I can enjoy a good radio or TV program

(1) Often

(2) Sometimes

(3) Not often

(4) Very seldom

The questions in this scale ask you about your feelings and

thoughts during THE LAST MONTH. In each case, please indicate

your response by selecting the circle that represents how often

you felt or thought a certain way.

  In the last month, how often have you been upset because of

    something that happened unexpectedly?

(1) Never

(2) Almost never

(3) Sometimes

(4) Fairly often

(5) Very often

In the last month, how often have you felt that you were

unable to control the important things in your life?

(1) Never

(2) Almost never

(3) Sometimes

(4) Fairly often

(5) Very often

In the last month, how often have you felt nervous and

"stressed"?

(1) Never

(2) Almost never

(3) Sometimes

(4) Fairly often

(5) Very often

In the last month, how often have you felt confident about

your ability to handle your personal problems?

(1) Never

(2) Almost never

(3) Sometimes

(4) Fairly often

(5) Very often

In the last month, how often have you felt that things were

going your way?

(1) Never

(2) Almost never

(3) Sometimes

(4) Fairly often

(5) Very often

In the last month, how often have you found that you could

not cope with all the things that you had to do?

(1) Never

(2) Almost never

(3) Sometimes

(4) Fairly often

(5) Very often

In the last month, how often have you been able to control

irritations in your life?

(1) Never

(2) Almost never

(3) Sometimes

(4) Fairly often

(5) Very often

In the last month, how often have you felt that you were on

top of things?

(1) Never

(2) Almost never

(3) Sometimes

(4) Fairly often

(5) Very often

In the last month, how often have you been angered because

of things that were outside your control?

(1) Never

(2) Almost never

(3) Sometimes

(4) Fairly often

(5) Very often

In the last month, how often have you felt difficulties

were piling up so high that you could not overcome them?

(1) Never

(2) Almost never

(3) Sometimes

(4) Fairly often

(5) Very often

Appendix 4.4: University staff study debrief sheet

<u>Measuring well-being in University staff – Debriefing</u>

Thank you for completing the questionnaire. As stated in the introduction, the aim of the questionnaire is to identify the important elements of well-being and compare the efficacy of short well-being measures to more detailed questionnaires.

The questionnaire you have just completed is part of a larger project which aims to research and develop mental health and well-being assessment tools for supporting employers and employees in Wales. The traditional method of assessing well-being in the workplace involves identification of negative job characteristics that the employee may be exposed to (e.g. time pressure), however this largely ignores the role of the individual in appraisal of those characteristics (e.g. coping style or optimism), and how positive appraisal may negate any effect on health outcomes such as depression.

The data you have provided for the questionnaire will therefore be used to:

- Identify the relationship between stimuli (e.g. job demands), individual characteristics (e.g. optimism), and outcomes (e.g. depression) as a way of defining well-being;
- Determine whether short-form or single item questions related to these elements can be combined as a short measure for overall well-being.

Your responses to the questionnaire will be held totally anonymously, with no questionnaire being traceable to an individual.

If you have any queries or concerns about the research, please contact either the researcher (Gary Williams) or the supervisor (Andy Smith) using the contact details below. If you are affected by any of the issues raised in the questionnaire then there are a number of services available through the university which can offer support at the following links:

http://www.cardiff.ac.uk/for/staff/wellbeingatwork/index.html (staff well-being at work)

http://www.cardiff.ac.uk/govrn/cocom/equalityanddiversity/index.html (equality and diversity)

http://www.cardiff.ac.uk/counselling/about/index.html (counselling service)

Thank you again for your participation.

Researcher	Supervisor
Gary Williams	Andy Smith
Postgraduate	Professor
School of Psychology	School of Psychology
Cardiff University	Cardiff University
63 Park Place	63 Park Place
Cardiff	Cardiff
CF10 3AS	CF10 3AS
Tel: 029 2087 6495	Tel: 029 2087 4757
Email: williamsgm3@cf.ac.uk	Email: smithap@cf.ac.uk

Appendix 4.5: Nurses study consent form
<u>Informed Consent</u>

I understand that my participation in this project will involve completing a questionnaire on aspects of my well-being in relation to my work experiences, self-perception, and mental and physical health, which will take approximately 1 hour of my time.

I understand that participation in this study is entirely voluntary and that I can withdraw from the study at any time without giving a reason and without loss of payment.

I understand that I am free to avoid responding to any questions that I feel uncomfortable answering and that I can discuss my concerns with Gary Williams (PhD Student) or Professor Andy Smith at the email addresses below.

I understand that the information provided by me will be held totally anonymously, with my email address provided separately for payment purposes, so that it is impossible to trace my responses back to me individually. I understand that this information may be retained indefinitely.

I also understand that at the end of the study I will be provided with additional information and feedback about the purpose of the study.

By checking the box below and continuing, I consent to participate in the study conducted by Gary Williams (PhD student), School of Psychology, Cardiff University with the supervision of Professor Andy Smith.

I have read and understood the above statement and consent to participate.

☐

<u>Contact Details</u>

Researcher	Supervisor
Gary Williams (PhD Student)	Prof Andy Smith
School of Psychology	School of Psychology
Cardiff University	Cardiff University
63 Park Place	63 Park Place
Cardiff	Cardiff
CF10 3AS	CF10 3AS
Tel: 029 2087 6495	Tel: 029 2087 4757
email: <u>williamsgm3@cf.ac.uk</u>	email: <u>smithap@cf.ac.uk</u>

Appendix 4.6: Nurses study instructions sheet

<u>Well-being in nursing staff - Instructions</u>

Thank you for agreeing to participate in this study, the aim of which is to identify the important elements of well-being in nurses and compare short well-being measures to more detailed measures. The questionnaire contains four main sections:

The first section requires you to complete short questions which may be referring to overall well-being, or some particular aspect of well-being (for example, job demands). Many of these questions will contain examples of what thoughts/behaviours the question is referring to which are important for understanding the focus of the question, but should be regarded as guidance rather than strict criteria.

The following three sections contain longer questionnaires related to your work, your life, your physical health and health behaviours. It is important to read each item carefully because it is common for scales or relevant timeframes to vary; this is especially important after a break in the page or on a new page.

We would like to request that you be as open and honest as possible with your responses and to avoid any perception of what you think a desirable answer might be. There are no right or wrong answers, but the reliability of the data depends on honest and accurate responding. Please also try to make sure you haven't inadvertently missed out any questions.

When you complete the questionnaire your email address will be registered for payment purposes, however your responses will not be traceable back to you and will be held totally anonymously. The questionnaire should take an hour to complete and you will be paid £10 for this time and entered to a prize draw for £100.

Finally, we remind you that you are free to withdraw from the study at any point, with no penalty, and that if you feel uncomfortable answering any of the questions you are free to not respond to those questions.

Thank you again for your participation.

Appendix 4.7: Nurses study questionnaire

The following sections contain short versions of the scales used throughout the questionnaire. Please read each description and the examples carefully, and state how much you agree or disagree with each statement.

 I feel that I do not have the time I need to get my work

   done (for example: I am under constant time pressure,

   interrupted in my work, or overwhelmed by responsibility or

   work demands)

Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly

I am satisfied with my relationships at work (for example: I

get the respect I deserve from colleagues, I am treated

fairly, I receive support when I need it)

Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly

I feel that I have been rewarded for my efforts (for

example: The respect, role, and job prospects I receive are

suitable for my efforts and achievements)

Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly

I feel that my work is too demanding (for example: I have to

work very fast, I have to work very hard, I have conflicting

demands)

Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly

I feel that I get adequate control over my work (for

example: I have a choice in what I do or how I do things, I

am able to learn new things, I am able to be creative)

Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly

I feel that I am supported by my colleagues (for example:

there is a good atmosphere at work, I get along with my

colleagues, my colleagues understand me)

Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly

I feel that I have been subjected to bullying in the

workplace in the past 12 months (for example: unjustified

criticism, verbal/non-verbal threats, violence, humiliation

or exclusion) ?

Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly

I feel that I am not consulted about changes at work (for

example: There is no opportunity to question managers about

change, I am unclear about how change will work out in

practice).

Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly

I feel that I don't understand my role clearly (For

example: I am not clear of what is expected of me and what

tasks I need to perform)

Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly

I feel that I get along well with my supervisor (For

example: I know where I stand in terms of their opinion of

me, my supervisor understands me, my supervisor recognises

my potential)

Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly

The next set of short questions are related to your feelings

about yourself. Please try to be as honest and accurate as

possible.

Thinking about myself and how I normally feel, in general, I

mostly experience positive feelings (For example: I feel

alert, inspired, determined, attentive)

Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly

Thinking about myself and how I normally feel, in general, I

mostly experience negative feelings (For example: I feel

upset, hostile, ashamed, nervous)

Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly

In general, I feel optimistic about the future (For example:

I usually expect the best, I expect more good things to

happen to me than bad, It's easy for me to relax)

Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly

I am confident in my ability to solve problems that I might

face in life (For example: I can usually handle whatever

comes my way, If I try hard enough I can overcome difficult

problems, I can stick to my aims and accomplish my goals)

Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly

 Overall, I feel that I have positive self-esteem (For

example: On the whole I am satisfied with myself, I am able

to do things as well as most other people, I feel that I am

a person of worth)

Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly

Coping Style:

Problem Focused

 When I find myself in stressful situations, I take a problem-focused approach (e.g. I take one step at a time, I change things about the situation or myself to deal with the 1issue, I don't let my feelings interfere too much).

Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly

Seeks Social Support

When I find myself in stressful situations, I look for social support (e.g. I talk to someone to get more information, I ask someone for advice, I talk to someone about how I'm feeling).

Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly

Blame Self

When I find myself in stressful situations, I blame myself (e.g. I criticize or lecture myself, I realise I brought the problem on myself).

Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly

Wishful Thinking

When I find myself in stressful situations, I wish for things to improve (e.g. I hope a miracle will happen, I wish I could change things about myself or circumstances, I daydream about a better situation).

Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly

Avoidance

When I find myself in stressful situations, I try to avoid the problem (e.g. I keep things to myself, I go on as if nothing has happened, I try to make myself feel better by eating/drinking/smoking).

Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly

Attributional Style

1

Please take a moment to imagine yourself in the following situations:

- You apply for a promotion and get it
- A colleague gives you a compliment
- You receive praise for something you have done

1a. When thinking of these situations, do you feel that the most likely cause is something within your control (e.g. your behaviour) or something beyond your control (e.g. good luck or circumstance, other people's behaviour)?

Completely								Completely	
Beyond My Control								Within My control	1
2	3	4	5	6	7	8	9	10	

1b. Try to imagine yourself in the situations above and similar positive experiences. Do you feel that the rating you have given to part 1a above applies to all such situations or only some of these situations?

Applies to very few situations								Applies to very many situations	
1	2	3	4	5	6	7	8	9	10

1c. How likely is it that the rating you have given to part <u>1a</u> above will apply to such situations in the future?

Very unlikely   Very likely

 1   2   3   4   5   6   7   8   9   10

<u>2</u>

Please now take a moment to imagine yourself in these different situations:

- You have been looking for a job unsuccessfully for some time
- You ask someone for help and they don't provide it
- You can't get everything done that is asked of you

<u>2a</u>. When thinking of these situations, do you feel that the most likely cause is something within your control (e.g. your behaviour) or something beyond your control (e.g. bad luck or circumstance, other peoples' behaviour)?

Completely   Completely

Beyond My Control   Within My Control

 1   2   3   4   5   6   7   8   9   10

2b. Try to imagine yourself in the situations in part <u>2a</u> above and similar negative experiences. Do you feel that the rating you have given to part <u>2a</u> applies to all such situations or only some of these situations?

Applies to very few situations   Applies to very many situations

1   2   3   4   5   6   7   8   9   10

2c. How likely is it that the rating you have given to part 2a above will apply to such situations in the future?

Very unlikely   Very likely

1   2   3   4   5   6   7   8   9   10

I prefer to keep to myself (For example: I don't talk much to other people, I feel withdrawn, I prefer not to draw attention to myself)

Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly

I feel that I have an agreeable nature (For example: I feel sympathy toward people in need, I like being kind to people, I'm co-operative)

Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly

I feel that I am a conscientious person (For example: I am always prepared, I make plans and stick to them, I pay attention to details)

Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly

  I feel that I can get on well with others (For example: I'm usually relaxed around others, I tend not to get jealous, I accept people as they are)

Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly

  I feel that I am open to new ideas (For example: I enjoy philosophical discussion, I like to be imaginative, I like to be creative)

Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly

  On a scale of one to ten, how depressed would you say you are in general? (e.g. feeling 'down', no longer looking forward to things or enjoying things that you used to)

Not at all depressed 1 2 3 4 5 6 7 8 9 10 Extremely depressed

----

  On a scale of one to ten, how anxious would you say you are in general? (e.g. feeling tense or 'wound up', unable to relax, feelings of worry or panic)

Not at all anxious 1 2 3 4 5 6 7 8 9 10 Extremely anxious

Overall, how stressful is your life outside of work?

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

Overall, how stressful do you find your job?

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

Overall, how satisfied are you with your current job?

Very Dissatisfied   1 2 3 4 5 6 7 8 9 10   Very Satisfied

 Overall, I feel that I am satisfied with my life (For example: In most ways my life is close to my ideal, so far I have gotten the important things I want in life)

Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly

SECTION 1: YOUR JOB

We would like to ask you some questions about you and work.

1.1 **a) What is your job title?**

_____

b) What do you mainly do in your job?

_____

_____

c) Which industry sector do you work in?

_____

d) Is the job full-time or part-time? (Full-time: 30 hours per week or more, Part

time: up to 30 hours per week)

Please tick ONE box.

Full-time
    Part-time   ☒

e) Is your job permanent, temporary/casual, or fixed contract? Please tick

ONE box.

Permanent   ☒

Temporary/casual   ☒

Fixed contract   ☒

f) Which one of the following best describes your current position at work.

Please tick one box.

         (* Total number in Company, not just those of whom you are in charge).

g) Please give the date you started this job.   / _____   _____

                                              month / year

h) In this job, how many hours per week do you work on average?   _____

Self-employed (25+ employees*)	☞	Manager (25+ employees*)	☞
Self-employed (less than 25 employees*)	☞	Manager (less than 25 employees*)	☞
Self-employed (no employees*)	☞	Supervisor	☞
		Employee	☞

i) What is your work pattern?

    Fixed hours   ☞

    Flexi-time   ☞

    Shift work   ☞

SHIFTWORKERS ONLY

j) What is the length of your current shift?

    6hrs   ☐

    8hrs   ☐

    12hrs   ☐

    Other

                        _____

k) How long have you worked shifts in this employment?   ___ / ___   _____

                                              years / months

l) How long have you worked shifts in any previous employment?   / _____   _____

                                              years / months

m) Are you aware of any health implications for working shifts?   Yes ☐ No ☐

n) Do you get any health screening or advice from your employer about working

    shifts?

    Yes ☐ No ☐

ON CALL WORKERS ONLY

o) Are you on call out of normal working hours (i.e. 9-5)? Yes ☐ No ☐

p) If yes, how often _____

(ALL)

q) Do you have any other paid jobs? Yes ☐ No ☐

SECTION 5: YOUR WORK ENVIRONMENT

		Often	Some-times	Seldom	Never/almost never
a)	Do you work at night?	☐	☐	☐	☐
b)	Do you do shift work?	☐	☐	☐	☐
c)	Do you have to work long or unsociable hours?	☐	☐	☐	☐

		Often	Some-times	Seldom	Never/ Not
d)	Do you have to be "on call" for work?	☐	☐	☐	☐
e)	Do you have unpredictable working hours?	☐	☐	☐	☐
f)	Does your job ever expose you to breathing fumes, dusts or other potentially harmful substances?	☐	☐	☐	☐
g)	Does your job ever require you to handle or touch potentially harmful substances or materials?	☐	☐	☐	☐
h)	Do you ever have work tasks that leave you with a ringing in your ears or a temporary feeling of deafness?	☐	☐	☐	☐
i)	Do you work in an environment where the level of background noise disturbs your concentration?	☐	☐	☐	☐

5.1   Now we would like to ask you about where you work. For each question please tick ONE answer that best describes your work.

Often   Some-   Seldom   Never/   Not

5.4 Please try to imagine yourself in the following situations. Then look at the example causes given in part a) and circle a number on the scale that represents how much you agree with the suggested cause (1= totally agree with the left side comment, 7 = totally with the right, 4 = both equally likely, or any number in between that matches your feeling). Then for that same cause answer parts b) and c) circling the appropriate number.

1a) A friend at work compliments you on your appearance. Is the cause likely to be due to:

(Your friend being polite)   or   (You looking good)

1   2   3   4   5   6   7

b) In similar situations in the future how likely is it that this explanation will again be true:

(Will rarely be true)   or   (Will often be true)

1   2   3   4   5   6   7

c) Does this explanation have an influence on just this situation, or does it affect other situations:

(Influences just this situation)   or   (Influences many other situations)

1   2   3   4   5   6   7

2a) You have been looking for a job unsuccessfully for some time. Is this likely to be due to:

(A bad job market)   or   (You needing more skills/experience)

1   2   3   4   5   6   7

b) In similar situations in the future how likely is it that this explanation will again be true:

(Will rarely be true)   or   (Will often be true)

1   2   3   4   5   6   7

c) Does this explanation have an influence on just this situation, or does it affect other situations:

(Influences just this situation)   or   (Influences many other situations)

1   2   3   4   5   6   7

3a) You become very successful and well-paid. Is this likely to be due to:

(You having good luck)   or   (Hard work and determination)

1   2   3   4   5   6   7

b) In similar situations in the future how likely is it that this explanation will again be true:

(Will rarely be true)   or   (Will often be true)

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

c) Does this explanation have an influence on just this situation, or does it affect other situations:

(Influences just this situation)   or   (Influences many other situations)

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

4a) You go to a colleague for help but they don't help you. Is this likely to be due to:

(Them being too busy)   or   (You not being a good enough friend)

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

b) In similar situations in the future how likely is it that this explanation will again be true:

(Will rarely be true)   or   (Will often be true)

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

c) Does this explanation have an influence on just this situation, or does it affect other situations:

(Influences just this situation)   or   (Influences many other situations)

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

5a) You give a talk in front of co-workers but they react negatively. Is this likely to be due to:

(Them being impatient and busy)   or   (You being poorly prepared)

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

b) In similar situations in the future how likely is it that this explanation will again be true:

(Will rarely be true)   or   (Will often be true)

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

c) Does this explanation have an influence on just this situation, or does it affect other situations:

(Influences just this situation)   or   (Influences many other situations)

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

6a) You do something at work which is highly praised. Is this likely to be due to:

(The work being easy)   or   (Your hard work and effort)

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

b) In similar situations in the future how likely is it that this explanation will again be true:

(Will rarely be true)   or   (Will often be true)

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

c) Does this explanation have an influence on just this situation, or does it affect other situations:

(Influences just this situation)   or   (Influences many other situations)

1   2   3   4   5   6   7

7a) A colleague you like acts in a hostile way towards you. Is this likely to be due to:

(Them being in a bad mood)   or   (You annoying them)

1   2   3   4   5   6   7

b) In similar situations in the future how likely is it that this explanation will again be true:

(Will rarely be true)   or   (Will often be true)

1   2   3   4   5   6   7

c) Does this explanation have an influence on just this situation, or does it affect other situations:

(Influences just this situation)   or   (Influences many other situations)

1   2   3   4   5   6   7

8a) You can't get all the work done that others expect of you. Is this likely to be due to:

(You being given too much work)   or   (Your lack of time planning)

1   2   3   4   5   6   7

b) In similar situations in the future how likely is it that this explanation will again be true:

(Will rarely be true)   or   (Will often be true)

1   2   3   4   5   6   7

c) Does this explanation have an influence on just this situation, or does it affect other situations:

(Influences just this situation)   or   (Influences many other situations)

1   2   3   4   5   6   7

9a) A colleague buys you a present. Is this likely to be due to:

(Him/Her being in a good mood)   or   (You having been extra nice to them)

1   2   3   4   5   6   7

b) In similar situations in the future how likely is it that this explanation will again be true:

(Will rarely be true)   or   (Will often be true)

1   2   3   4   5   6   7

c) Does this explanation have an influence on just this situation, or does it affect other situations:

(Influences just this situation)   or   (Influences many other situations)

1   2   3   4   5   6   7

10a) You apply for a promotion that you want and you get it. Is this likely to be due to:

(Lack of other qualified applicants)   or   (The strength of your application/CV)

1   2   3   4   5   6   7

b) In similar situations in the future how likely is it that this explanation will again be true:

(Will rarely be true)   or   (Will often be true)

1   2   3   4   5   6   7

c) Does this explanation have an influence on just this situation, or does it affect other situations:

(Influences just this situation)   or   (Influences many other situations)

1   2   3   4   5   6   7

11a) A meeting goes badly with a superior you wanted to impress. Is this likely to be due to:

(The other person having a bad day)   or   (Them being unimpressed with you)

1   2   3   4   5   6   7

b) In similar situations in the future how likely is it that this explanation will again be true:

(Will rarely be true)   or   (Will often be true)

1   2   3   4   5   6   7

c) Does this explanation have an influence on just this situation, or does it affect other situations:

(Influences just this situation)   or   (Influences many other situations)

1   2   3   4   5   6   7

12a) You get a raise. Is this likely to be due to:

(Everyone getting a raise)   or   (Your hard work and commitment)

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

b) In similar situations in the future how likely is it that this explanation will again be true:

(Will rarely be true)   or   (Will often be true)

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

c) Does this explanation have an influence on just this situation, or does it affect other situations:

(Influences just this situation)   or   (Influences many other situations)

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

5.5   The following statements refer to potential sources of stress in your job.   Please   indicate   the frequency with which you experience these at work.

		Never	Occas-ionally	Frequently	Very Frequently
1.	Performing procedures that patients experience as painful.				
2.	Criticism by a physician.				
3.	Feeling inadequately prepared to help with the emotional needs of a patient's family.				
4.	Lack of opportunity to talk openly with other personnel about problems in the work setting.				
5.	Conflict with a supervisor.				
6.	Inadequate information from a physician regarding the medical condition of a patient.				
7.	Patients making unreasonable demands.				
8.	Being sexually harassed.				
9.	Feeling helpless in the case of a patient who fails to improve.				
10.	Conflict with a physician.				
11.	Being asked a question by a patient for which I do not have a satisfactory answer.				
12.	Lack of opportunity to share experiences and feelings with other personnel in the work setting.				

	Never	Occas-	Frequently	Very

13. Unpredictable staffing and scheduling.

14. A physician ordering what appears to be inappropriate treatment for a patient.

15. Patients' families making unreasonable demands.

16. Experiencing discrimination because of race or ethnicity.

17. Listening or talking to a patient about his/her approaching death.

18. Fear of making a mistake in treating a patient.

19. Feeling inadequately prepared to help with the emotional needs of a patient.

20. Lack of an opportunity to express to other personnel on the unit my negative feelings towards patients.

21. Difficulty in working with a particular nurse (or nurses) in my immediate work setting.

22. Difficulty in working with a particular nurse (or nurses) outside my immediate work setting.

23. Not enough time to provide emotional support to the patient.

24. A physician not being present in a medical emergency.

25. Being blamed for anything that goes wrong.

26. Experiencing discrimination on the basis of sex.

27. The death of a patient.

28. Disagreement concerning the treatment of a patient.

29. Feeling inadequately trained for what I have to do.

30. Lack of support from my immediate supervisor.

31. Criticism by a supervisor.

32. Not enough time to complete all of my nursing tasks.

33. Not knowing what a patient or a patient's family ought to be told about the patient's condition and its treatment.

34. Being the one that has to deal with patients' families.

		Never	Occas-ionally	Frequently	Very Frequently
35.	Having to deal with violent patients.	❧	❧	❧	❧
36.	Being exposed to health and safety hazards.	❧	❧	❧	❧
37.	The death of a patient with whom you developed a close relationship.	❧	❧	❧	❧
38.	Making a decision concerning a patient when the physician is unavailable.	❧	❧	❧	❧
39.	Being in charge with inadequate experience.	❧	❧	❧	❧
40.	Lack of support by nursing administrators.	❧	❧	❧	❧
41.	Too many non-nursing tasks required, such as clerical work.	❧	❧	❧	❧
42.	Not enough staff to adequately cover the unit.	❧	❧	❧	❧
43.	Uncertainty regarding the operation and functioning of specialised equipment.	❧	❧	❧	❧
44.	Having to deal with abusive patients.	❧	❧	❧	❧

		Never	Occas-ionally	Frequently	Very Frequently
45.	Not enough time to respond to the needs of patients' families.	✍	✍	✍	✍
46.	Being accountable for things over which I have no control.	✍	✍	✍	✍
47.	Physician (s) not being present when a patient dies.	✍	✍	✍	✍
48.	Having to organize doctors' work.	✍	✍	✍	✍
49.	Lack of support from other healthcare administrators.	✍	✍	✍	✍
50.	Difficulty in working with nurses of the opposite sex.	✍	✍	✍	✍
51.	Demands of patient classification system.	✍	✍	✍	✍
52.	Having to deal with abuse from patients' families.	✍	✍	✍	✍

		Never	Occas-ionally	Frequently	Very Frequently
53.	Watching a patient suffer.	✍	✍	✍	✍

354

		Not at all	Some-times	Often	All the time
54.	Criticism by nursing administration.	☙	☙	☙	☙
55.	Having to work through breaks.	☙	☙	☙	☙
56.	Not knowing whether patients' families will report you for inadequate care.	☙	☙	☙	☙
57.	Having to make decisions under pressure.	☙	☙	☙	☙

5.6 Please try and remember a stressful situation that you have experienced at work in the last two months. If you can't think of a work situation please think of another situation. Now please read each of the following items and tick the appropriate box on the scale from 0 to 3, to show how much you used each approach to try and deal with the stress and to make yourself feel better.

		Not at all	Some-times	Often	All the time
1.	Bargained or compromised to get something positive from the situation.	☙	☙	☙	☙
2.	Concentrated on something good that could come out of the whole thing.	☙	☙	☙	☙
3.	Tried not to burn my bridges behind me, tried to leave things open.	☙	☙	☙	☙

4. Changed myself to be a better person.

5. Made a plan of action and followed it.

6. Accepted the next best thing to what I wanted.

7. Came out of the experience a better person than when I went in.

8. Tried not to act too hastily.

9. Changed something so that things would turn out alright.

10. Just took things one step at a time.

11. I knew what had to be done, so I tried harder to make things work.

12. Came up with a couple of different solutions to the problem.

	Not at all	Some-times	Often	All the time
13. Accepted my strong feelings, but didn't let them interfere with other things too much.				
14. Changed something about myself so I could deal with the situation better.				

15. Stood my ground and fought for what I wanted.

16. Talked to someone to find out more about the situation.

17. Accepted sympathy and understanding from someone.

18. Got professional help and did what they recommended.

19. Talked to someone who could do something about the problem.

20. Asked someone I respected for advice and followed it.

21. Talked to someone about how I was feeling.

22. Blamed myself.

23. Criticized or lectured myself.

24. Realised I brought the problem on myself.

25. Hoped a miracle would happen.

26. Wished I was a stronger person – more optimistic and forceful.

27. Wished that I could change what had happened.

28. Wished I could change the way that I felt.

29. Daydreamed or imagined a better time or place than the one I was in.

30. Had fantasies or wished about how things might turn out.

31. Thought about fantastic things to make myself feel better (like finding a million pounds).

32. Wished the situation would go away or somehow be finished.

33. Went on as if nothing had happened.

34. Felt bad that I couldn't avoid the problem.

35. Kept my feelings to myself.

	Not at all	Some-times	Often	All the time
36. Slept more than usual.				
37. Got angry at the people or things that caused the problem.				
38. Tried to forget the whole thing.				

39. Tried to make myself feel better by eating, drinking, smoking or taking medications.   ☐   ☐   ☐   ☐

40. Avoided being with other people.   ☐   ☐   ☐   ☐

41. Didn't tell others how bad things were.   ☐   ☐   ☐   ☐

42. Refused to believe it had happened.   ☐   ☐   ☐   ☐

SECTION 6: DEMOGRAPHICS

6.1 Age: ……… **yrs**

6.2 Sex: ☐ ☐

           M   **F**

6.3 Current Status: (Please tick one box only)

Single	☐	Separated	☐
Living with partner	☐	Divorced	☐
Married	☐	Widowed	☐

6.4   Education Completed: (Please tick one box only)

None	✍	City & Guilds/national diploma	✍
GCSE/ 'O' Level	✍	BA/BSc	✍
AS Level/SCE Higher/Matriculation	✍	Higher degree/professional qualification	✍

6.5   How would you describe yourself?

White	✍	Black Caribbean	✍
Black African	✍	Black neither Caribbean or African	✍
Indian	✍	Pakistani	✍
Bangladeshi	✍	Chinese	✍
		None of these (Please specify) ✍	

_____

6.6   What is the total current yearly amount you receive from your wage, pension, benefit allowance or annual salary (before tax is deducted)? Please indicate one category.

less than £2,500 ❧   £2,500-£4,999   ❧   £5,000-£9,999   ❧

£10,000-£15,999   ❧ £16,000-£19,999   ❧   £20,000-£24,999   ❧

£25,000-£29,999   ❧ £30,000-39,999   ❧   £40,000-49,999 ❧

£50,000 or more   ❧

THANK YOU FOR YOUR PARTICIPATION

Appendix 4.8: Nurses study debrief sheet

<u>Measuring well-being in Nurses – Debrief</u>

Thank you for completing the questionnaire. As stated in the introduction, the aim of the study is to identify the important elements of well-being in nurses and compare short well-being measures to more detailed measures.

The questionnaire you have just completed is part of a larger project which aims to research and develop mental health and well-being assessment tools for supporting employers and employees in Wales. The traditional method of assessing well-being in the workplace involves identification of negative job characteristics that the employee may be exposed to (e.g. time pressure), however this largely ignores the role of the individual (e.g. how well they can cope with stress). Furthermore, lengthy questionnaires are not the most practical way of measuring well-being where time and cost are important.

The data you have provided in the questionnaire will therefore be used to:

- Identify the relationship between work and individual characteristics and well-being
- Determine whether single item questions can perform as well as longer questionnaires for measuring well-being

Your responses to the questionnaire will be held totally anonymously, with no questionnaire being traceable to an individual.

If you have any queries or concerns about the research, please contact either the researcher (Gary Williams, PhD Student) or the supervisor (Andy Smith) using the contact details below. If you are affected by any of the issues raised in the questionnaire then there are a number of services available that can offer support at the following links:

http://www.cardiff.ac.uk/for/staff/wellbeingatwork/index.html (staff well-being at work)

http://www.cardiff.ac.uk/govrn/cocom/equalityanddiversity/index.html (equality and diversity)

Employee wellbeing counselling service (Tel: 029 2074 4465, email:employee.wellbeing@cardiffandvale.wales.nhs.uk)

Thank you again for your participation.

Researcher

Gary Williams

Postgraduate Student

School of Psychology

Cardiff University

63 Park Place

Cardiff

CF10 3AS

Tel: 029 2087 6495

Email: williamsgm3@cf.ac.uk

Supervisor

Andy Smith

Professor

School of Psychology

Cardiff University

63 Park Place

Cardiff

CF10 3AS

Tel: 029 2087 4757

Email: smithap@cf.ac.uk

Appendix 7.1: Student project studies consent, instructions and debrief forms
<u>Informed Consent</u>

I understand that my participation in this project will involve completing a questionnaire on aspects of my university experiences, personality, and well-being and that scores from my January exams will be obtained by Professor Andy Smith. This will be done using your student number and the database will then be made anonymous by removing this variable.

I understand that participation in this study is entirely voluntary and that I can withdraw from the study at any time without giving a reason.

I understand that I am free to avoid responding to any questions that I feel uncomfortable answering and that I can discuss my concerns with Bethan Carter (Undergraduate Student) or Professor Andy Smith at the email addresses below.

I understand that the information provided by me will be held totally anonymously, with my email address provided separately for credit purposes, so that it is impossible to trace my responses back to me individually. I understand that this information may be retained indefinitely.

I also understand that at the end of the study I will be provided with additional information and feedback about the purpose of the study.

By checking the box below and continuing, I consent to participate in the study conducted by Bethan Carter (Undergraduate student), School of Psychology, Cardiff University with the supervision of Professor Andy Smith.

I have read and understood the above statement and consent to participate.

☐

<u>Contact Details</u>

Researcher	Supervisor
Bethan Carter (Student)	Prof Andy Smith
School of Psychology	School of Psychology
Cardiff University	Cardiff University
63 Park Place	63 Park Place
Cardiff	Cardiff
CF10 3AS	CF10 3AS
	Tel: 029 2087 4757
email: carterb@cf.ac.uk	email: smithap@cf.ac.uk

Thank you for agreeing to participate in this study on the effects of psychosocial and health-related behaviours on the academic attainment of students. You will be required to complete an online questionnaire that should take no longer than 20 minutes time. This will be the entirety of your participation however, we request access to your January exam results. This information will be stored anonymously.

Once you have submitted the questionnaire, you will be given a link to another page where you can provide your email address separate from your responses for credit payment purposes. YOU MUST FILL IN THIS INFORMATION IN ORDER TO RECIEVE YOUR COURSE CREDITS.

THE QUESTIONNAIRE IS NOW COMPLETE, THANK YOU FOR YOUR PARTICIPATION

Debrief – The Effects of Psychosocial and Health-Related Behaviours on the Academic Attainment of University Students

Thank you for completing the questionnaire. The questions you answered are intended to provide short ratings of life events and social support that are relevant to students, along with ratings of personality and well-being such as self-esteem, depression and happiness. The data you provided will be used to investigate whether any of these factors have an effect on the academic attainment of university students. This will be achieved by looking at relationships between the factors examined in the questionnaire and participants' results from January exams. It may be that findings from this research will have implications for students by raising awareness of the importance of a healthy lifestyle and promoting positive mental health for academic success.

Information and previous findings of the effects of psychosocial and health related behaviours on the academic achievement of students can be found in the references below:

Trockel, M.T., Barnes, M.D., Egget, D.L., (2000). Health-Related Variables and Academic Performance Among First-Year College Students: Implications for Sleep and Other Behaviours. *Journal of American College Health, 49,* 125-131.

Chamorro-Premuzic, D., Furnham, A. (2003). Personality predicts academic performance: Efidence from two longitudinal university samples. *Journal of Research in Personality, 37*(4), 319-338.

If you have any queries or concerns about the research, please contact either the researcher (Bethan Carter) or the supervisor (Andy Smith) using the contact details below. If you are affected by any of the issues raised in the questionnaire then there are a number of services available through the university which can offer support at the following links:

http://www.cardiff.ac.uk/govrn/cocom/equalityanddiversity/index.html (equality and diversity)

http://www.cardiff.ac.uk/counselling/about/index.html (counselling service)

Thank you again for your participation.

Researcher	**Supervisor**
Bethan Carter	Andy Smith
Undergraduate Student	Professor
School of Psychology	School of Psychology
Cardiff University	Cardiff University
63 Park Place	63 Park Place
Cardiff	Cardiff
CF10 3AS	CF10 3AS
email: carterb@cf.ac.uk	email: smithap@cf.ac.uk

Informed Consent

I understand that my participation in this project will involve completing a questionnaire on aspects of my part-time work experiences, university experiences, personality, well-being and lifestyle.

I understand that participation in this study is entirely voluntary and that I can withdraw from the study at any time without giving a reason and without loss of credit.

I understand that I am free to avoid responding to any questions that I feel uncomfortable answering and that I can discuss my concerns with Katherine Davies (UGD Student) or Professor Andy Smith at the email addresses below.

I understand that the information provided by me will be held totally anonymously, so that it is impossible to trace my responses back to me individually. I understand that this information may be retained indefinitely.

I also understand that at the end of the study I will be provided with additional information and feedback about the purpose of the study.

By checking the box below and continuing, I consent to participate in the study conducted by Katherine Davies (UGD Student), School of Psychology, Cardiff University with the supervision of Professor Andy Smith.

I have read and understood the above statement and consent to participate.

☐

<u>Contact Details</u>

Researcher	Supervisor
Katherine Davies (UGD Student)	Prof Andy Smith
School of Psychology	School of Psychology
Cardiff University	Cardiff University
email: daviesk29@cf.ac.uk	63 Park Place
	Cardiff
	CF10 3AS
	Tel: 029 2087 4757
	email: smithap@cf.ac.uk

<u>Instructions</u>

Thank you for agreeing to participate in this study on students' experiences and well-being. You will be required to complete an online questionnaire. The questionnaire is detailed so please follow the instructions carefully.

The questionnaire should take a maximum of 30 minutes each to complete.

You can omit questions at any point if you feel unhappy answering them, but please pay close attention to the questions and answer truthfully. Please do not take any breaks during the study as it may impact the findings of the questionnaire.

THE QUESTIONNAIRE IS NOW COMPLETE, THANK YOU FOR YOUR PARTICIPATION

<u>Debrief – Stress in university students and the role of part-time work and other factors</u>

Thank you for completing the questionnaires. The questions you answered are intended to provide information on whether undertaking part-time employment during university impacts on student wellbeing and perceived academic performance. It also measured short ratings of life events and social support that are relevant to students, along with ratings of personality and well-being such as self-esteem, depression and happiness. The data you provided can be used to determine whether students' well-being is affected by elements of part-time work, and whether any changes are related to a university workload, financial stability and aspects of personality such as time management behaviours and emotional intelligence.

Information relevant to the study can be found in the references below:

Rochford, C., Connolly, M., & Drennan, J. (2009). Part-time paid employment and academic performance of undergraduate nursing students. *Nurse Education Today, 29(6)*, 601-606.

Mark, G. & Smith, A.P. (2012). Effects of occupational stress, job characteristics, coping, and attributional style on the mental health and job satisfaction of university employees. *Anxiety, Stress and Coping, 25(1)*, 63-78.

Misra, R. & McKean, M. (2000). College students' academic stress and its relation to their anxiety, time management, and leisure satisfaction. *American Journal of Health Studies, 16(1)*, 41-51.

If you have any queries or concerns about the research, please contact either the researcher (Katherine Davies) or the supervisor (Andy Smith) using the contact details below. If you are affected by any of the issues raised in the questionnaire then there are a number of services available through the university which can offer support at the following links:

http://www.cardiff.ac.uk/govrn/cocom/equalityanddiversity/index.html (equality and diversity)

http://www.cardiff.ac.uk/counselling/about/index.html (counselling service)

Thank you again for your participation.

Researcher	**Supervisor**
Katherine Davies	Andy Smith
UGD Student	Professor
School of Psychology	School of Psychology
Cardiff University	Cardiff University
email: daviesk29@cf.ac.uk	63 Park Place
	Cardiff
	CF10 3AS
	e-mail: smithap@cardiff.ac.uk

Informed Consent

I understand that my participation in this project will involve completing a questionnaire on aspects of my well-being and lifestyle, and also my diet over the last 6 months. I understand that my questionnaire responses will then be linked to my January exam grades using my student number which will then be removed from the database to maintain anonymity.

I understand that participation in this study is entirely voluntary and that I can withdraw from the study at any time without giving a reason and without loss of credits.

I understand that I am free to avoid responding to any questions that I feel uncomfortable answering and that I can discuss my concerns with Marie Oak (UG Student) or Professor Andy Smith at the email addresses below.

I understand that the information provided by me will be held totally anonymously, with my student number provided solely in order to link my responses to my exam results.

The student number will be deleted after the survey results have been linked to my exam results. I understand that this information may be retained indefinitely.

I also understand that at the end of the study I will be provided with additional information and feedback about the purpose of the study.

By checking the box below and continuing, I consent to participate in the study conducted by Marie Oak (UG student), School of Psychology, Cardiff University with the supervision of Professor Andy Smith.

I have read and understood the above statement and consent to participate.

☐

Contact Details

Researcher

Marie Oak (UG Student)

School of Psychology

Cardiff University

63 Park Place

Cardiff

CF10 3AS

Tel: 029 2087 6495

Supervisor

Prof Andy Smith

School of Psychology

Cardiff University

63 Park Place

Cardiff

CF10 3AS

Tel: 029 2087 4757

email: oakm@cf.ac.uk   email: smithap@cf.ac.uk

Instructions

Thank you for agreeing to participate in this study on students' diet and academic attainment. The study consist of one online questionnaire that is sectioned into three parts; 1) questions about your well-being, 2) questions about your lifestyle, and 3) questions about your diet over the last 6 months.

The questionnaire should take a maximum of 30 minutes to complete. Please ensure you enter your student number carefully as this will be used to link your questionnaire responses to your exam results before anonymising the data and will also allow allocation of your credits.

THE QUESTIONNAIRE IS NOW COMPLETE, THANK YOU FOR YOUR PARTICIPATION

Debrief – Students' Diet and Academic Attainment

Thank you for completing the questionnaire. The questions you answered are intended to provide short ratings of personality and well-being (such as self-esteem, depression and happiness), aspects of lifestyle (such as smoking, alcohol consumption and exercise), and dietary habits. The data you provided will be linked to your January exam results via your student number. The student number will be deleted after the survey results have been linked to my exam results. This is to determine whether students' diet has an effect on academic attainment when effects of psychosocial factors (such as the lifestyle factors measured in the questionnaire) are controlled for.

Information on diet and academic attainment can be found in the references below:

Florence, M. D., Asbridge, M., & Veugelers, P. J. (2008). Diet Quality and Academic Performance. *Journal of School Health, 78*(4), 209-215.

Kleinman. R. E., Hall. S., Green. H., Korzec-Ramirez, D., Patton, K., Pagano, M. E., & Murphy, J. M. (2002). Diet, Breakfast, and Academic Performance in Children. *Annals of Nutrition and Metabolism, 46*(1), 24-30.

If you have any queries or concerns about the research, please contact either the researcher (Marie Oak) or the supervisor (Andy Smith) using the contact details below. If you are affected by any of the issues raised in the questionnaire then there are a number of services available through the university which can offer support at the following links:

http://www.cardiff.ac.uk/govrn/cocom/equalityanddiversity/index.html (equality and diversity)

http://www.cardiff.ac.uk/counselling/about/index.html (counselling service)

 Thank you again for your participation.

Researcher	**Supervisor**
Marie Oak	Andy Smith
UG Student	Professor
School of Psychology	School of Psychology
Cardiff University	Cardiff University
63 Park Place	63 Park Place
Cardiff	Cardiff
CF10 3AS	CF10 3AS
email: oakm@cf.ac.uk	email: smithap@cf.ac.uk

If you have any ethical concerns about this research, you may wish to contact:

Psychology Ethics Committee Secretary
Email: psychethics@cf.ac.uk

Phone: +44 (0)29 208 74007

Fax: +44 (0)29 2087 4858

Address: Psychology Ethics Committee Secretary

Cardiff University
Tower Building
Park Place
Cardiff
CF10 3AT

<u>Informed Consent</u>

I understand that my participation in this project will involve completing a questionnaire on aspects of my lifestyle, personality, and well-being.

I understand that participation in this study is entirely voluntary and that I can withdraw from the study at any time without giving a reason and without loss of course credit.

I understand that I am free to avoid responding to any questions that I feel uncomfortable answering and that I can discuss my concerns with Helen Oliver (undergraduate) or Professor Andy Smith at the email addresses below.

I understand that the information provided by me will be held totally anonymously, so that it is impossible to trace my responses back to me individually. I understand that this information may be retained indefinitely.

I also understand that at the end of the study I will be provided with additional information and feedback about the purpose of the study.

By checking the box below and continuing, I consent to participate in the study conducted by Helen Oliver (undergraduate), School of Psychology, Cardiff University with the supervision of Professor Andy Smith.

I have read and understood the above statement and consent to participate.

☐

<u>Contact Details</u>

Researcher	Supervisor
Helen Oliver (undergraduate)	Prof Andy Smith
School of Psychology	School of Psychology
Cardiff University	Cardiff University
63 Park Place	63 Park Place
Cardiff	Cardiff
CF10 3AS	CF10 3AS
Tel: 029 2087 6495	Tel: 029 2087 4757
email: oliverhm@cardiff.ac.uk	email: smithap@cf.ac.uk

<u>Instructions</u>

Thank you for agreeing to participate in this study on lifestyle and well-being over time. The study consists of an online questionnaire which should take a maximum of 20 minutes to complete.

At the end of the questionnaire, you will be given a link to another page where you must provide your email address separately from your responses in order to receive course credit.

<u>Debrief – Physical activity and the psychosocial factors of well-being</u>

Thank you for completing the questionnaire. The questions you answered are intended to provide short ratings of lifestyle and how physically active you are, along with ratings of personality and well-being such as self-esteem, depression and happiness. The data you provided can be used to determine whether there is an interaction of lifestyle behaviours upon psychological functioning or feelings, and which aspects of physical activity mostly affect this relationship.

Information on lifestyle, physical activity, and well-being can be found in the references below:

Kull, M. (2003). Physical activity and mental health: Relationships between depressiveness, psychological disorders and physical activity level in women. *Biology of Sport, 20*(2), 129-138.

Steptoe, A. & Butler, N. (1996). Sports participation and emotional well-being in adolescents. *The Lancet, 347*, 1789-1792.

If you have any queries or concerns about the research, please contact either the researcher (Helen Oliver) or the supervisor (Andy Smith) using the contact details below. If you are affected by any of the issues raised in the questionnaire then there are a number of services available through the university which can offer support at the following links:

http://www.cardiff.ac.uk/govrn/cocom/equalityanddiversity/index.html (equality and diversity)

http://www.cardiff.ac.uk/counselling/about/index.html (counselling service)

Thank you again for your participation.

Researcher	**Supervisor**
Helen Oliver	Andy Smith
Undergraduate student	Professor
School of Psychology	School of Psychology
Cardiff University	Cardiff University
63 Park Place	63 Park Place

Cardiff

CF10 3AS

email: oliverhm@cardiff.ac.uk

Cardiff

CF10 3AS

email: smithap@cf.ac.uk

Appendix 7.2: Student project studies well-being questions used

Questionnaire

Students' Well-being

The following questions contain a number of single-item measures of aspects of your life as a student and feelings about yourself. Many of these questions will contain examples of what thoughts/behaviours the question is referring to which are important for understanding the focus of the question, but should be regarded as guidance rather than strict criteria. Please try to be as accurate as possible, but avoid thinking too much about your answers, your first instinct is usually the best.

On a scale of one to ten, how depressed would you say you are in general? (e.g. feeling 'down', no longer looking forward to things or enjoying things that you used to)

Not at all depressed 1 2 3 4 5 6 7 8 9 10 Extremely depressed

Thinking about myself and how I normally feel, in general, I mostly experience positive feelings (For example: I feel alert, inspired, determined, attentive)

Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly

In general, I feel optimistic about the future (For example: I usually expect the best, I expect more good things to happen to me than bad, It's easy for me to relax)

Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly

I am confident in my ability to solve problems that I might face in life (For example: I can usually handle whatever comes my way, If I try hard enough I can overcome difficult problems, I can stick to my aims and accomplish my goals)

Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly

I feel that I am laid-back about things (For example: I do just enough to get by, I tend to not complete what I've started, I find it difficult to get down to work)

Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly

Overall, I feel that I have positive self-esteem (For example: On the whole I am satisfied with myself, I am able to do things as well as most other people, I feel that I am a person of worth)

Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly

I feel that I have the social support I need (For example: There is someone who will listen to me when I need to talk, there is someone who will give me good advice, there is someone who shows me love and affection)

Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly

Thinking about myself and how I normally feel, in general, I mostly experience negative feelings (For example: I feel upset, hostile, ashamed, nervous)

Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly

Coping Style:

Problem Focused

When I find myself in stressful situations, I take a problem-focused approach (e.g. I take one step at a time, I change things about the situation or myself to deal with the issue, I don't let my feelings interfere too much).

Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly

Seeks Social Support

When I find myself in stressful situations, I look for social support (e.g. I talk to someone to get more information, I ask someone for advice, I talk to someone about how I'm feeling).

Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly

Blame Self

When I find myself in stressful situations, I blame myself (e.g. I criticize or lecture myself, I realise I brought the problem on myself).

Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly

<u>Wishful Thinking</u>

When I find myself in stressful situations, I wish for things to improve (e.g. I hope a miracle will happen, I wish I could change things about myself or circumstances, I daydream about a better situation).

Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly

<u>Avoidance</u>

When I find myself in stressful situations, I try to avoid the problem (e.g. I keep things to myself, I go on as if nothing has happened, I try to make myself feel better by eating/drinking/smoking).

Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly

I feel that I have an agreeable nature (For example: I feel sympathy toward people in need, I like being kind to people, I'm co-operative)

Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly

I feel that I am a conscientious person (For example: I am always prepared, I make plans and stick to them, I pay attention to details)

Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly

I feel that I can get on well with others (For example: I'm usually relaxed around others, I tend not to get jealous, I accept people as they are)

Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly

I feel that I am open to new ideas (For example: I enjoy philosophical discussion, I like to be imaginative, I like to be creative)

Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly

Overall, I feel that I am satisfied with my life (For example: In most ways my life is close to my ideal, so far I have gotten the important things I want in life)

Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly

On a scale of one to ten, how anxious would you say you are in general? (e.g. feeling tense or 'wound up', unable to relax, feelings of worry or panic)

Not at all anxious 1 2 3 4 5 6 7 8 9 10 Extremely anxious

Overall, how stressful is your life?

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

Please consider the following elements of student life and indicate overall to what extent they have been a part of your life over the past 6 months. Remember to use the examples as guidance rather than trying to consider each of them specifically:

1. Challenges to your development (e.g. important decisions about your education and future career, dissatisfaction with your written or mathematical ability, struggling to meet your own or others' academic standards).

Not at all part of my life 1 2 3 4 5 6 7 8 9 10 Very much part of my life

2. Time pressures (e.g. too many things to do at once, interruptions of your school work, a lot of responsibilities).

Not at all part of my life 1 2 3 4 5 6 7 8 9 10 Very much part of my life

3. Academic Dissatisfaction (e.g. disliking your studies, finding courses uninteresting, dissatisfaction with school).

Not at all part of my life 1 2 3 4 5 6 7 8 9 10 Very much part of my life

4. Romantic Problems (e.g. decisions about intimate relationships, conflicts with boyfriends'/girlfriends' family, conflicts with boyfriend/girlfriend).

Not at all part of my life 1 2 3 4 5 6 7 8 9 10 Very much part of my life

5. Societal Annoyances (e.g. getting ripped off or cheated in the purchase of services, social conflicts over smoking, disliking fellow students).

Not at all part of my life 1 2 3 4 5 6 7 8 9 10 Very much part of my life

6. Social Mistreatment (e.g. social rejection, loneliness, being taken advantage of).

Not at all part of my life 1 2 3 4 5 6 7 8 9 10 Very much part of my life

7. Friendship problems (e.g. conflicts with friends, being let down or disappointed by friends, having your trust betrayed by friends).

Not at all part of my life 1 2 3 4 5 6 7 8 9 10 Very much part of my life

Please state how much you agree or disagree with the following statements:

1. There is a person or people in my life who would provide tangible support for me when I need it (for example: money for tuition or books, use of their car, furniture for a new apartment).

Strongly Disagree   1 2 3 4 5 6 7 8 9 10   Strongly Agree

2. There is a person or people in my life who would provide me with a sense of belonging (for example: I could find someone to go to a movie with me, I often get invited to do things with other people, I regularly hang out with friends).

Strongly Disagree   1 2 3 4 5 6 7 8 9 10   Strongly Agree

3. There is a person or people in my life with whom I would feel perfectly comfortable discussing any problems I might have (for example: difficulties with my social life, getting along with my parents, sexual problems).

Strongly Disagree   1 2 3 4 5 6 7 8 9 10   Strongly Agree

Appendix 7.3: Students' well-being over time study consent form
<u>Informed Consent</u>

I understand that my participation in this project will involve completing a questionnaire on aspects of my university experiences, personality, and well-being at 3 points throughout the academic year.

I understand that participation in this study is entirely voluntary and that I can withdraw from the study at any time without giving a reason and without loss of payment.

I understand that I am free to avoid responding to any questions that I feel uncomfortable answering and that I can discuss my concerns with Gary Williams (PhD Student), Professor Andy Smith, or the university ethics committee at the email addresses below.

I understand that the information provided by me will be held totally anonymously, with my email address provided separately for payment purposes, so that it is impossible to trace my responses back to me individually. I understand that this information may be retained indefinitely.

I also understand that at the end of the study I will be provided with additional information and feedback about the purpose of the study.

By checking the box below and continuing, I consent to participate in the study conducted by Gary Williams (PhD student), School of Psychology, Cardiff University with the supervision of Professor Andy Smith.

I have read and understood the above statement and consent to participate.

☐

<u>Contact Details</u>

Researcher	Supervisor	Psychology Ethics
Gary Williams (PhD Student)	Prof Andy Smith	psychethics@cardiff.ac.uk
School of Psychology	School of Psychology	Tel: +44 (0) 029 208 70360
Cardiff University	Cardiff University	
63 Park Place	63 Park Place	
Cardiff	Cardiff	
CF10 3AS	CF10 3AS	
Tel: 029 2087 6495	Tel: 029 2087 4757	
email: <u>williamsgm3@cf.ac.uk</u>	email: smithap@cf.ac.uk	

Appendix 7.4: Students' well-being over time study instructions form

<u>Instructions</u>

Thank you for agreeing to participate in this study on well-being over time. The study requires you to complete an online questionnaire every day for 2 weeks.

The questionnaires should take a maximum of 15 minutes each to complete. At the end of each questionnaire, once you have submitted, you will be given a link to another page where you can provide your email address separate from your responses for payment purposes. YOU MUST FILL IN THIS INFORMATION IN ORDER TO BE PAID. In order to be paid cash you will need to attend 63 Park Place in person.

You will have been sent a unique identifier in order to link each questionnaire together, however to maintain anonymity once this has been sent no record linking the identifier and your email address will be kept by us. Please therefore keep the identifier safe as you will need it for stages 2 and 3 and we will not be able to re-send it if it has been lost.

Appendix 7.5: Students' well-being over time study questionnaire

Questionnaire

The Inventory of College Students' Recent Life Experiences

The following is a list of experiences which many students have at some time or other. Please indicate for each experience how much it has been a part of your life over the past month. Mark your answers according to the following guide:

Intensity of Experience over the Past Month

0 = not at all part of my life

1 = only slightly part of my life

2 = distinctly part of my life

3 = very much part of my life

____1. Conflicts with boyfriend's/girlfriend's/spouse's family

____2. Being let down or disappointed by friends

____3. Conflict with teacher(s)

____4. Social rejection

____5. Too many things to do at once

____6. Being taken for granted

____7. Financial conflicts with family members

____8. Having your trust betrayed by a friend

____9. Separation from people you care about

____10. Having your contributions overlooked

____11. Struggling to meet your own academic standards

____12. Being taken advantage of

____13. Not enough leisure time

____14. Struggling to meet the academic standards of others

____15. A lot of responsibilities

____16. Dissatisfaction with school

____17. Decisions about intimate relationship(s)

____18. Not enough time to meet your obligations

____19. Dissatisfaction with your mathematical ability

____20. Important decisions about your future career

____21. Financial burdens

____22. Dissatisfaction with your reading ability

____23. Important decisions about your education

____24. Loneliness

____25. Lower grades than you hoped for

____26. Conflict with GTA/other tutors(s)

____27. Not enough time for sleep

____28. Conflicts with your family

____29. Heavy demands from extracurricular activities

____30. Finding courses too demanding

____31. Conflicts with friends

____32. Hard effort to get ahead

____33. Poor health of a friend

____34. Disliking your studies

____35. Getting "ripped off" or cheated in the purchase of services

____36. Social conflicts over smoking

____37. Difficulties with transportation

____38. Disliking fellow student(s)

____39. Conflicts with boyfriend/girlfriend/spouse

____40. Dissatisfaction with your ability at written expression

____41. Interruptions of your school work

____42. Social isolation

____43. Long waits to get service (e.g., at banks, stores, etc.)

____44. Being ignored

____45. Dissatisfaction with your physical appearance

____46. Finding course(s) uninteresting

____47. Gossip concerning someone you care about

____48. Failing to get expected job

____49. Dissatisfaction with your athletic skills

Interpersonal Support Evaluation List

This scale is made up of a list of statements each of which may or may not be true about you. For each statement we would like you to circle **probably TRUE (PT)** if the statement is true about you or **probably false (PF)** if the statement if not true about you.

You may find that many of the statements are neither clearly true nor clearly false. In these cases, try to decide quickly whether probably true or probably false is most descriptive of you. Although some questions will be difficult to answer, it is important that you pick one alternative or the other. Remember to circle only one of the alternatives for each statement.

Please read each item quickly but carefully before responding. Remember that this is not a test and there are no right or wrong answers.

Tangible scale
1. I know someone who would loan me £50 so I could go away for the weekend.
2. I know someone who would give me some old dishes if I moved into my own apartment.
3. I know someone who would loan me £100 to help pay my tuition.
4. If I needed it, my family would provide me with an allowance and spending money.
5. If I wanted a date for a party next weekend, I know someone at university or in town who would fix me up.
6. I know someone at university or in town who would bring my meals to my room or apartment if I were sick.
8. I don't know anyone who would give me some old furniture if I moved into my own apartment.
9. Even if I needed it my family would (or could) not give me money for tuition and books.
10. I don't know anyone at school or in town who would help me study for an exam by spending several hours reading me questions.
11. I don't know anyone at school or in town who would loan me their car for a couple of hours.
12. I don't know anyone at school or in town who would get assignments for me from my teachers if I was sick.

Belonging scale
1. There are people at school or in town who I regularly run with, exercise with, or play sports with.
2. I hang out in a friend's room or apartment quite a lot.
3. I can get a date who I enjoy spending time with whenever I want.
4. If I decided at dinner time to take a study break this evening and go to a movie, I could easily find someone to go with me.
5. People hang out in my room or apartment during the day or in the evening.
6. I belong to a group at school or in town that meets regularly or does things together regularly.
7. I am not a member of any social groups (such as church groups, clubs, teams, etc.)
8. Lately, I often feel lonely, like I don't have anyone to reach out to.
9. I don't have friends at school or in town who would comfort me by showing some physical affection.
10. I don't often get invited to do things with other people.
11. I don't talk to a member of my family at least once a week.
12. I don't usually spend two evenings on the weekend doing something with others.

Appraisal Scale
1. I know someone who I see or talk to often with whom I would feel perfectly comfortable talking about problems I might have budgeting my time between school and my social life.
2. I know someone who I see or talk to often with whom I would feel perfectly comfortable talking about any problems I might have adjusting to university life.
3. I know someone who I see or talk to often with whom I would feel perfectly comfortable talking about sexually transmitted diseases.
4. I know someone who I see or talk to often with whom I would feel perfectly comfortable talking about any problems I might have meeting people.
5. I know someone who I see or talk to often with whom I would feel perfectly comfortable discussing any sexual problems I might have.
6. I know someone who I see or talk to often with whom I would feel perfectly comfortable talking about any

problems I might have with drugs.

7. There isn't anyone at school or in town with whom I would feel perfectly comfortable talking about any problems I might have with making friends.

8. There isn't anyone at school or in town with whom I would feel perfectly comfortable talking about any problems I might have getting along with my parents.

9. There isn't anyone at school or in town with whom I would feel perfectly comfortable talking about difficulties with my social life.

10. There isn't anyone at school or in town with whom I would feel perfectly comfortable talking about my feelings of loneliness and depression.

11. I don't know anyone at school or in town who makes my problems clearer and easier to understand.

12. Lately, when I've been troubled, I keep things to myself.

Students' Well-being

The following questions contain a number of single-item measures of aspects of your life as a student and feelings about yourself. Many of these questions will contain examples of what thoughts/behaviours the question is referring to which are important for understanding the focus of the question, but should be regarded as guidance rather than strict criteria. Please try to be as accurate as possible, but avoid thinking too much about your answers, your first instinct is usually the best.

Overall, I feel that I have low self-esteem (For example: At times, I feel that I am no good at all, at times I feel useless, I am inclined to feel that I am a failure)

Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly

On a scale of one to ten, how depressed would you say you are in general? (e.g. feeling 'down', no longer looking forward to things or enjoying things that you used to)

Not at all depressed 1 2 3 4 5 6 7 8 9 10 Extremely depressed

Thinking about myself and how I normally feel, in general, I mostly experience positive feelings (For example: I feel alert, inspired, determined, attentive)

Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly

In general, I feel optimistic about the future (For example: I usually expect the best, I expect more good things to happen to me than bad, It's easy for me to relax)

Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly

I am confident in my ability to solve problems that I might face in life (For example: I can usually handle whatever comes my way, If I try hard enough I can overcome difficult problems, I can stick to my aims and accomplish my goals)

Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly

Overall, I feel that I have positive self-esteem (For example: On the whole I am satisfied with myself, I am able to do things as well as most other people, I feel that I am a person of worth)

Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly

Thinking about myself and how I normally feel, in general, I mostly experience negative feelings (For example: I feel upset, hostile, ashamed, nervous)

Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly

Coping Style:

Problem Focused

When I find myself in stressful situations, I take a problem-focused approach (e.g. I take one step at a time, I change things about the situation or myself to deal with the issue, I don't let my feelings interfere too much).

Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly

Seeks Social Support

When I find myself in stressful situations, I look for social support (e.g. I talk to someone to get more information, I ask someone for advice, I talk to someone about how I'm feeling).

Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly

<u>Blame Self</u>

When I find myself in stressful situations, I blame myself (e.g. I criticize or lecture myself, I realise I brought the problem on myself).

Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly

<u>Wishful Thinking</u>

When I find myself in stressful situations, I wish for things to improve (e.g. I hope a miracle will happen, I wish I could change things about myself or circumstances, I daydream about a better situation).

Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly

<u>Avoidance</u>

When I find myself in stressful situations, I try to avoid the problem (e.g. I keep things to myself, I go on as if nothing has happened, I try to make myself feel better by eating/drinking/smoking).

Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly

Overall, I feel that I am satisfied with my life (For example: In most ways my life is close to my ideal, so far I have gotten the important things I want in life)

Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly

  On a scale of one to ten, how anxious would you say you are in general? (e.g. feeling tense or 'wound up', unable to relax, feelings of worry or panic)

Not at all anxious 1 2 3 4 5 6 7 8 9 10 Extremely anxious

  Overall, how stressful is your life?

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

Please consider the following elements of student life and indicate overall to what extent they have been a part of your life over the past 6 months. Remember to use the examples as guidance rather than trying to consider each of them specifically:

1. Challenges to your development (e.g. important decisions about your education and future career, dissatisfaction with your written or mathematical ability, struggling to meet your own or others' academic standards).

Not at all part of my life 1 2 3 4 5 6 7 8 9 10 Very much part of my life

2. Time pressures (e.g. too many things to do at once, interruptions of your school work, a lot of responsibilities).

Not at all part of my life 1 2 3 4 5 6 7 8 9 10 Very much part of my life

3. Academic Dissatisfaction (e.g. disliking your studies, finding courses uninteresting, dissatisfaction with school).

Not at all part of my life 1 2 3 4 5 6 7 8 9 10 Very much part of my life

4. Romantic Problems (e.g. decisions about intimate relationships, conflicts with boyfriends'/girlfriends' family, conflicts with boyfriend/girlfriend).

Not at all part of my life 1 2 3 4 5 6 7 8 9 10 Very much part of my life

5. Societal Annoyances (e.g. getting ripped off or cheated in the purchase of services, social conflicts over smoking, disliking fellow students).

Not at all part of my life 1 2 3 4 5 6 7 8 9 10 Very much part of my life

6. Social Mistreatment (e.g. social rejection, loneliness, being taken advantage of).

Not at all part of my life 1 2 3 4 5 6 7 8 9 10 Very much part of my life

7. Friendship problems (e.g. conflicts with friends, being let down or disappointed by friends, having your trust betrayed by friends).

Not at all part of my life 1 2 3 4 5 6 7 8 9 10 Very much part of my life

Please state how much you agree or disagree with the following statements:

1. There is a person or people in my life who would provide tangible support for me when I need it (for example: money for tuition or books, use of their car, furniture for a new apartment).

Strongly Disagree   1 2 3 4 5 6 7 8 9 10   Strongly Agree

2. There is a person or people in my life who would provide me with a sense of belonging (for example: I could find someone to go to a movie with me, I often get invited to do things with other people, I regularly hang out with friends).

Strongly Disagree   1 2 3 4 5 6 7 8 9 10   Strongly Agree

3. There is a person or people in my life with whom I would feel perfectly comfortable discussing any problems I might have (for example: difficulties with my social life, getting along with my parents, sexual problems).

Strongly Disagree   1 2 3 4 5 6 7 8 9 10   Strongly Agree

THE QUESTIONNAIRE IS NOW COMPLETE, THANK YOU FOR YOUR PARTICIPATION

Appendix 7.6: Students' well-being over time study debrief sheet

Debrief – Students' well-being over time

Thank you for completing the questionnaires. The questions you answered are intended to provide short ratings of life events and social support that are relevant to students, along with ratings of personality and well-being such as self-esteem, depression and happiness. The data you provided can be used to determine whether students' well-being changes throughout the year (for example at times of assessment), and whether any changes are related to a change in the life events experienced or a presence or lack of relevant social support.

Information on life events, social support, and well-being can be found in the reference below:

Cohen, S., & Wills, T. A. (1985). Stress, Social Support, and the Buffering Hypothesis. *Psychological Bulletin, 98*(2), 310-357.

If you have any queries or concerns about the research, please contact either the researcher (Gary Williams), the supervisor (Andy Smith), or the university ethics committee using the contact details below. If you are affected by any of the issues raised in the questionnaire then there are a number of services available through the university which can offer support at the following links:

http://www.cardiff.ac.uk/govrn/cocom/equalityanddiversity/index.html (equality and diversity)

http://www.cardiff.ac.uk/counselling/about/index.html (counselling service)

Thank you again for your participation.

Researcher	**Supervisor**	**Psychology Ethics**
Gary Williams	Andy Smith	psychethics@cardiff.ac.uk
PhD Student	Professor	Tel: +44 (0) 029 208 70360
School of Psychology	School of Psychology	
Cardiff University	Cardiff University	
63 Park Place	63 Park Place	
Cardiff	Cardiff	
CF10 3AS	CF10 3AS	