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**Developing a national index of subjective wellbeing:  
The Australian Unity Wellbeing Index**

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Abstract

The Australian Unity Wellbeing Index has been designed as a new barometer of Australians' satisfaction with their lives, and life in Australia. It is based on, and develops, the theoretical model of subjective wellbeing homeostasis. The Index comprises two sub-scales of Personal and National Wellbeing. Data were collected through a nationally representative sample of 2,000 people in April/May 2001. Factor analysis confirmed the integrity of the two sub-scales and, confirming empirical expectation, the average level of life satisfaction was 75.5 percent of the scale maximum score. Group comparisons revealed that all age groups maintained their Personal Index score within the normal range. In addition, people in country areas were more satisfied with their personal lives than city-dwellers, but less satisfied about the national situation, and people who had recently experienced a strong positive event evidenced a rise in wellbeing, whereas those who had experienced a strong negative event evidenced wellbeing in the low-normal range. It is argued that these data generally support homeostatic theory. However, an unusual result was that females were more satisfied with their own lives than males. A tentative argument is advanced that this may represent a constitutional difference. It is concluded that the Australian Unity Wellbeing Index has potential as a valid, reliable and sensitive instrument to monitor national wellbeing.

### Introduction

This paper describes the development and application of a national index of subjective wellbeing, the Australian Unity Wellbeing Index. The index is, potentially, a complementary indicator of national performance and progress to the dominant economic measures. As is well known, the goodness of societies has been traditionally measured through wealth. This was formalized in the 1930's by the economist Simon Kuznets. He devised the term Gross National Product (GNP) to describe the dollar value of a nation's output (see Shea, 1976, for a review). A variant of GNP, Gross Domestic Product (GDP) is now more commonly used, representing the value of all goods and services produced within a nation. It is commonly assumed that the more dollars being earned and spent the better, so a country with high GDP is better than one with low GDP. The science of economics has thus been optimistically described as "nearest the core of any problem concerning the "quality of life" because "the quality of life of any individual or community can in a direct and simple way be related to income" (Wilson, 1972, p.131).

To some extent this is demonstrably true. Countries with a high GDP can afford better health care, education, and welfare than countries with low GNP (see, e.g. Lai, 2000). But when this source of comparison is applied between Western nations, all of which have a decent, average standard of living, it becomes clear that GDP fails as a relative index of population wellbeing (for reviews see Eckersley, 1998; Redefining Progress, 1995; Shea, 1976). The reasons are as follows:

1. The GDP was never intended as a measure of population wellbeing. It is merely the tally of products and services bought and sold. As described by Redefining Progress (1995), GDP makes no distinction "between transactions that add to wellbeing, and those that diminish it. Instead of separating costs from benefits, and productive activities from destructive ones, the GDP assumes that every monetary transaction adds to wellbeing. It is as if a business tried to assess its financial condition by simply adding up all 'business activity', thereby lumping together income and expenses, assets and liabilities." (p.1). Thus, GDP includes as positive additions to the index, moneys spent fighting the breakdown of social structure, exploitative destruction of the natural environment, maintaining prisons, health care following drug abuse, and so on.

2. Even in monetary terms, the GDP disregards income distribution. It also disregards important aspects of living such as respect and privacy, and is indifferent to moral values (Shea, 1976). Moreover, whereas GDP has risen in Western countries over the past few decades, no such increase is evident in measures of subjective wellbeing (Eckersley, 2000a).

From this realization that GDP is inadequate for the purpose of measuring quality of life, several alternative economic indices have been devised. For example, the Genuine Progress Indicator (Halstead, 1998; Hamilton, 1998) disaggregates positive from negative economic expenditure, while the Human Development Index (see, Lai, 2000) extends economic measurement to also include measures of population longevity and education.

### Social indicators

The inclusion of population measures other than those based on simple economic indices, has given rise to a galaxy of new estimations of societal functioning called Social Indicators (see Land, 2000, for a review). These have been defined as a "...statistic of direct normative interest which facilitates concise, comprehensive and balanced judgments about the condition of major aspects of a society." (U.S. Department of Health, Education & Welfare, 1969, p.97). Despite the vast number of potential Social Indicators, until recently they were all objective measures. These represent frequencies or quantities that can be simultaneously verified by any number of persons. Such indices fail, however, to measure how people feel about their lives. This requires the use of subjective social indicators. Moreover the distinction is important since objective indicators generally are very poor predictors of subjective quality of life (Cummins, 1998).

Systematic research into the use of subjective indicators was initiated by two independent and major studies in the USA (Andrews & Withey, 1976; Campbell, Converse & Rodgers, 1976). Both involved large population surveys using subjective indices of wellbeing, and both provided a detailed and insightful analysis of the resulting data. Numerous such surveys followed. Then, in 1995, Cummins assembled 16 estimates of population life satisfaction derived from Western nations and reported the surprising finding that they averaged to 75 percent of the scale maximum score (75%SM) with a standard deviation of just 2.5%SM. In other words the mean value from population surveys of subjective wellbeing, conducted in

Western nations, can be predicted to lie within the narrow range of 70-80%SM. This result has been replicated on several occasions (Cummins, 1998, 2002) and appears to be reliable.

In order to explain this narrow, positive range of values, Cummins has proposed a Theory of Subjective Wellbeing Homeostasis (Cummins, 1998; Cummins & Nistico, 2002; Cummins, Gullone & Lau, 2002).

#### The Theory of Subjective Wellbeing Homeostasis

The theory proposes that, in a manner analogous to the homeostatic maintenance of blood pressure or temperature, subjective wellbeing is actively controlled and maintained by a set of psychological devices (see Cummins & Nistico, 2002, for an extended description) that function under the control of personality. The operation of these devices is most evident at the level of general, personal wellbeing. That is, homeostasis operates at a non-specific, abstract level, as exemplified by the classic question “How satisfied are you with your life as a whole?” Given the extraordinary generality of this question, the response that people give reflects their general state of subjective wellbeing which, it is proposed, is precisely the level at which the homeostatic system operates. As one consequence, the level of satisfaction people record to this question has the following characteristics:

- (a) It is remarkably stable. While unusually good or bad events will cause it to change in the short term, over a period of time the aforementioned ‘psychological devices’ will return this non-specific satisfaction with life to its previous level (see Hanestad & Albrektsen, 1992; Headey & Wearing, 1989; Suh & Diener, 1996).
- (b) The ‘set-point’, around which an individual’s subjective wellbeing varies, lies in the ‘satisfied’ sector of the dissatisfied-satisfied continuum. That is, on a scale where zero represents complete dissatisfaction with life and 100 represents complete satisfaction, people’s set-point normally lies within the positive scale range of 50-100 (see Cummins et al., 2002).
- (c) At a population level within Western nations, the average is 75 on a 0-100 scale. In other words, on average people feel that their general satisfaction with life is about three-quarters of its maximum extent.

While this generalized sense of wellbeing is held positive with such remarkable tenacity, it is not immutable. A sufficiently adverse environment can defeat the homeostatic system and, when this occurs, the level of subjective wellbeing falls below its homeostatic range. This phenomenon has been recorded at both the personal and at the population level of measurement. For example, people who experience the chronic pain of arthritis or the stress of caring for a severely disabled family member at home have low levels of subjective wellbeing (e.g. Cummins, 2001). At the level of populations, Black South Africans, for example, live in such dreadful circumstances that their population levels of wellbeing are much reduced from the normal range. However, studies conducted by Valerie Moller have shown how such levels can be, at least temporarily, changed. She found that the subjective wellbeing of this group rose to the normal levels of Western populations immediately following the election of the ANC, Black Majority Government, but that one year later had returned to their previous levels (Moller, 1988, 1992). This indicates that people who are suffering homeostatic defeat can experience marked upward shifts in subjective wellbeing if homeostasis is restored. However, for people who are already maintaining a normally functioning homeostatic system, their levels of generalized subjective wellbeing will show little relationship to normal variations in their chronic circumstances of living.

#### Non-Personal and Specific Wellbeing

The homeostatic system, as described, has the role of creating a positive sense of wellbeing that is both non-specific and highly personalized. It is concerned only with the perceived wellbeing of the individual who is making this assessment and only in the most general sense. As one effect of this, people generally feel they are 'superior' to other people, or better than average (Dodge & Kahn, 1931; Headey & Wearing, 1988, 1989; Diener, Such, Lucas & Smith, 1999). They believe they are luckier, happier and more moral (Andrews & Withey, 1976). This is all part of the general 'positive bias' that is 'value added' by the brain to such thought processes and which leads, under the normal circumstances of living, to a generalized positive self-view (Taylor & Brown, 1988; Weinstein, 1989).

These characteristics also make the personal sense of wellbeing fairly impervious to the slings and arrows of misfortune. Because these beliefs are held at such an abstract level, specific instances of personal misfortune or incompetence that might damage the sense of personal wellbeing can be dismissed in order to maintain the abstract belief. This general idea is not novel. For example, Tesser, Pilkington and McIntosh (1989) provide empirical support

for a model of Self-Evaluation Maintenance, in which the self recognises good performance on a variety of dimensions, yet aspires to ‘be good at’ (or personally values) only a few such dimensions. Thus, one’s own performance is not threatening to self-evaluation provided that failures are confined to non-valued dimensions in life. Such processes assist people who are deaf, for example, to maintain a positive self-view (Bat-Chava, 1994).

While the classic ‘life as a whole’ question is useful as an estimate of the homeostatic set-point, due to its high level of abstraction it cannot provide information about the components of life that also contribute, positively or negatively, to this sense of wellbeing. In order to approach such information, questions need to be directed at satisfaction with life domains.

There is converging agreement within the literature on the identification of the minimal set of domains that form the first-level deconstruction of personal wellbeing. One such approximation is offered by the Comprehensive Quality of Life Scale (ComQol: Cummins, 1997a) which identifies seven domains. Theoretically, such a set should be sufficient to describe the entire ‘life as a whole’, and this case has been argued (see Cummins, 1997b). Moreover, the mean satisfaction score derived from the domains should approximate satisfaction expressed to ‘life as a whole’, and this too has been verified (Cummins, 1996). The domains’ mean score and the life as a whole score are not, however, expected to be identical, due to the differing levels of abstraction in each.

While satisfaction with ‘life as a whole’ is proposed to approximate the homeostatic set-point, this is not so for the domains. Since questions at this level (e.g. How satisfied are you with your health?) are directed at broad but identifiable aspects of life, more specific information processing and affect linkage can be brought to bear on an evaluation of satisfaction. Consequently, the homeostatic influence on the satisfaction response will be diluted and the level of satisfaction will be allowed to vary either above or below the set-point.

The above description refers to satisfaction measurement along the abstract-specific dimension. Another dimension relevant to satisfaction measurement is distance from the self (proximal-distal) which ranges from highly personal to societal/global (see, e.g., Harris & Middleton, 1994). Since the purpose of homeostasis is to maintain a sense of personal wellbeing, the influence of the generalized ‘positive bias’ effect decreases as satisfaction

evaluations move away from self to, for example, family and friends, and is very much reduced in relation to the broader society. Thus, as evaluations of satisfaction move from proximal (personal) to distal (societal), the overall level of homeostatically-driven satisfaction diminishes, and the evaluation process becomes increasingly influenced by factors other than simply the need to protect the self from negative appraisals.

As an example, people's level of satisfaction with society's institutions such as government or the welfare system is only just positive at best. Cummins (1996) reported that 16 population mean scores, derived from items concerning satisfaction with government instrumentalities, averaged  $55.6 \pm 6.5\%SM$ . It seems sensible, therefore, as suggested by Eckersley (2000a,b), that given the stability and positive bias inherent in subjective measures of personal wellbeing, survey instruments should also incorporate subjective measures of societal wellbeing in order to be maximally sensitive to change. As domains are distanced from the homeostatic influence by becoming more distal and/or more specific, they should show greater variability and sensitivity to the actual life conditions.

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Insert Figure 1 here

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The hypothesized relationship between the two influences of abstract-specific and proximal-distal, in relation to scale sensitivity (the extent to which a person's response will be influenced by the objective reality of their situation), is depicted in Figure 1. These relationships are predicted on the basis of the amount of 'positive bias' people are likely to attribute to specific satisfaction targets, as has been described. Thus 'sensitivity' is the inverse of 'homeostatic control'. Consistent with this idea, Figure 1 shows low sensitivity for personal, abstract evaluations, but higher sensitivity for distal and specific evaluations.

Two observations, consistent with the arguments made in the preceding text, can be made regarding the relationships depicted in Figure 1. The first is that the rate at which sensitivity decreases with increasing abstraction is lower for societal than for personal measures. This reflects the overall lower degree of homeostatic influence on societal measures. The second is that the degree of variability within the measures should reflect the major source of influence. Variability within personal-abstract measures will reflect individual differences in the set-



point determined by personality. Variability within the distal-specific measures will reflect variations in the object or experience being evaluated. Because of this, the abstract-personal measures will evidence little sensitivity to changing circumstances provided that homeostasis is maintained. However, if the life circumstances become powerful enough to defeat homeostasis, they will wrest control of life satisfaction away from the homeostatic system and induce variability within the abstract-personal measures.

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Insert Figure 2 here

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In order to depict the taxonomic descriptive scheme of items within the two dimensions that have been described, Figure 2 has been prepared. This 'bi-dimensional' model depicts the Proximal-Distal dimension at the three levels of Personal, Neighbourhood, and National society. The middle category has not been elaborated since it is expected to perform in an intermediate fashion.

#### Creation of the Australian Unity Wellbeing Index

The use of subjective measures as the basis for national indices of wellbeing has been generally resisted. Government instrumentalities responsible for generating such national indices still largely exclude such measures despite strong evidence of their reliability and validity, and the fact that objective and subjective indicators generally show a very weak relationship to one another, as has been stated.

It is surely time for this situation to change. Subjective social indicators have the scientific credibility to form such indices and, indeed, their use for this purpose has recently been endorsed by the foremost authority on subjective wellbeing (Diener, 2000). But Homeostasis Theory carries good and bad news for the implementation of this proposition. On the positive side, estimates of population subjective wellbeing can now be normatively referenced to the range 70-80%SM. On the negative side, Homeostasis Theory predicts that such estimates are unlikely to show much variation across time in Western nations.

There is, however, a solution to this problem provided by the Bi-Dimensional Model depicted in Figure 2. This indicates the theoretical prediction that item sensitivity will increase (i.e. the

homeostatic influence will decrease) as items become more specific and more distal. Thus, the Australian Unity Wellbeing Index has been created with a view to measuring subjective wellbeing across these various dimensions as follows:

1. Two questions tap the abstract dimension, one at the proximal (personal) level and the other at the distal (national) level.
2. Two domain-level scales have been created. The personal scale has been based on the Comprehensive Quality of Life Scale (Cummins, 1997a). It comprises seven items, the mean scores for which are averaged to give the Personal Wellbeing Index. The distal scale comprises three items (recently expanded to six; Cummins et al., 2001) the average score of which forms the National Wellbeing Index.

Several sub-domain items are also included that allow specific issues to be examined in more detail. These are satisfaction with wealth/income distribution, health services, and family support. Additionally, one item measures social capital, while two others explore differences between states and trends in wellbeing. These related to whether people feel life is changing for better or for worse, in respect of both personal and societal wellbeing. Eckersley (2000a) has noted that such items are not seeking to measure how full the glass of wellbeing is, but whether the level is rising or falling, and so might yield very different results. On the basis of past findings, it was predicted that the responses to the trend questions would be lower than for Index questions, being less tied to homeostatic influences, but that they would still show a similar personal-national difference.

For all but the last two questions, respondents were asked to rate their satisfaction on a scale of 0 (extremely dissatisfied) to 10 (extremely satisfied). The final two trend questions also used a 0-10 scale, but here 0 meant much worse and 10 much better.

The final question asked people whether or not they had recently experienced an event that made them happier or sadder than normal. Those that had experienced such an event were then asked to rate, from 0 to 10, the influence of that event on how they felt now.

Demographic factors included in the survey were gender, age and the Accessibility/Remoteness Index of Australia (ARIA) was used to create sample groupings based on

geographical access to societal resources. This measure has been designed as a geographical approach to remoteness that excludes socio-economic, urban/rural, and population size factors. ARIA interprets remoteness as accessibility to 201 service centres. Remoteness values are derived from the road distance to services centres. A continuous variable from 0 (high accessibility) to 12 (high remoteness) is produced. (For further information: <http://www.health.gov.au/pubs/hfsocc/ocpanew6a.htm>). For the purpose of this report three categories were created as follows: highly accessible, accessible, and moderate-low accessible.

### Procedure

Data collection occurred over a three-week period from 23 April 2001 to 11 May 2001. There was no special reason to select these dates other than the fact that this time was logistically convenient and coincided with a relatively stable and nationally uneventful period in Australia.

A firm was contracted to provide 15,000 names and telephone numbers that collectively represented the national population on a geographically proportional basis. A team of six people under the direction of Omar Sali then used the Call Centre at Australian Unity to ring people drawn randomly from the supplied list. All calls were made between the hours of 5.00 – 8.30 pm on week-days and 10.00 am to 6.00 pm on week-ends.

Each telephone operator was provided with a protocol for each call displayed on a computer screen. Data were entered directly by each operator into an electronic database. Questionnaire completion took an average 4-5 minutes of contact with each participant and an average 7.5 minutes of operator time for each completed questionnaire across the whole study.

In order to achieve the target of 2,000 respondents, a total of 11,806 calls was made representing a response rate of 16.9%. However, about one third of these calls failed to connect with a potential respondent, yielding an acceptance rate of around 25%.

### Results

The means and standard deviations presented in Table 1 are in units of Percentage of Scale Maximum (%SM). In order to convert Likert scale data into this standard form, each Likert scale is coded from 0 to x, where 0 represents the lowest, and x represents the highest

response category. The Likert score is then converted using the formula  $(\text{score}/x) \times 100$  to produce %SM units on a 0 to 100 distribution.

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Insert Table 1 here

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There is a remarkable level of consistency within these data. The means across all survey variables have a range of 30.4%SM (48.1 to 78.4%SM) with all except one lying within the positive side of the distribution. The standard deviations of these variables have only a 4.5%SM range (18.5 to 23.0%SM) and the domain intercorrelations agree to within .37 (range .21 to .58) with all being positive and significant. Such results are, perhaps, most obviously explained by the common question stem of ‘satisfaction’. It is notable, however, that the two ‘optimism’ items regarding trends for the future did not ask about satisfaction and have means and standard deviations that also fall well within the above-stated ranges.

#### Factor analysis

In order to determine the coherence of the personal and national sub-scales, the 10 domains were subjected to a principal components factor analysis, followed by an oblimin rotation. Table 1 indicates that all variables correlated  $>.3$  with at least one other variable, and all other assumptions for such an analysis were met. Two clear factors emerged, together explaining 52.2 percent of the variance, and with the items conforming to the sub-scales depicted in Table 1. The seven items of the Personal Wellbeing Index loaded .51 to .72 on their factor, a maximum of .17 on the second factor, and explained 38.3 percent of the variance. The three items of the National Wellbeing Index loaded .75 to .86 on their factor, a maximum of 0.1 on the first factor, and explained 13.9 percent of the variance. It is concluded that the factor structure of these two indices has been established.

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Insert Table 2 here

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As can be seen from Table 2, the indices and other measured components were positively and significantly related to one another. The two indices correlated .44.

Domain validation

In order to validate the domains of each Index, the seven domains of the Personal Index and the three domains of the National Index were regressed against the other survey variables. The results are presented in Table 3.

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Insert Table 3 here

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Within the personal index, standard of living makes by far the largest unique contribution to the prediction of life as a whole (A). All other domains made a significant contribution of unique variance with the exception of safety. This domain also exhibited the lowest set of bi-variate correlates with the other domains (Table 1) and the weakest loading (.51) within the Personal Wellbeing factor.

On these grounds an argument could be mounted to exclude the domain of safety from the Personal Wellbeing Index. This domain does, however, exhibit more relevance when used to predict other variables, while the contribution of other domains approaches zero. This changing pattern can be seen in columns B to F in Table 3. Here, for example, safety contributes 1.1% unique variance to the prediction of social capital (one quarter of the total unique variance), while the other domains of achievement and relationships make no unique contribution to this prediction. A summary of these analyses, based on the Personal Index, domains, is as follows:

1. All of the variables (A to F) are significantly predicted by the combined domains.
2. The two domains that make no unique contribution to the prediction of variables B to F are achievement and relationships. Both of these, however, made a significant unique contribution to the prediction of 'Life as a whole' (Variable A).
3. The domains that provide the most consistent unique contribution to the prediction of variables A to F are Future Security, Health, and Standard of Living. Each made a significant unique contribution to the prediction of all six dependent variables.

Within the National Index, all three domains contributed to the prediction of satisfaction with 'Australia as a whole'. Moreover, in a manner analogous to the dominance of 'Standard of living' in the Personal Index, here 'Economic situation' made the largest unique contribution.

Other similarities between the two Indexes are also apparent. First, while the domain 'State of the environment' made a weak contribution to the prediction of 'Australia as a whole', it made a stronger unique contribution to the prediction of some other dependent variables. Overall, however, the pattern of domain contribution to the prediction of dependent variables was more regular than was found with the personal domains.

A second point of similarity is that the National Index domains, in combination, were able to significantly predict all six dependent variables. Moreover, neither index demonstrated an overall superiority in predictive power over the six dependent variables. The Personal Index had a higher predictive capacity over life as a whole and own life changing, the National Index had a higher predictive capacity over life in Australia and Australia changing, while the indices did not differ in their capacity to predict social capital. These differences constitute further evidence for the validity of the two scales.

#### Tests of the model

Generally speaking, the data are consistent with our expectations. The score of 75.5%SM for satisfaction with life as a whole matches the 'gold standard' of 75% for Western countries and provides further support for the view that population levels of life satisfaction in Australia are highly predictable.

Because the Personal Index domains are more specific than 'life as a whole', and yet cover the overall experience of life, the model predicts that they will exhibit a lower aggregate score, due to the diminished influence of homeostasis, while exhibiting limited variability. These expectations were confirmed. The seven domains average to 73.5%SM, which is significantly below 'life as a whole' ( $p=.000$ ). The domains also showed a range of around 10 percentage points. At the top of the range is personal relationships (78.4%SM), and at the bottom is community connectedness (69.0%SM).

The score for satisfaction with life in Australia is 69.8%SM. This is also lower than that for personal life satisfaction, as the model predicts based on the former being less personal.

Moreover, and again consistent with the model, the national life domains, being more specific, yielded 57.1%SM which falls well below the more abstract ‘Life in Australia’.

It is interesting to note that the more specific sub-domain items of national wellbeing did not consistently produce levels of satisfaction below the national life domains. This may be because scores that lie marginally above the point of neutrality (50%SM) are evidencing little influence from the homeostatic system. Such scores, therefore, more truly reflect people’s judgment on the basis of perceived merit.

Finally, it can be seen that the data on perception of life changing for better or worse again reflect the proposed proximal-distal dimension of the model. Thus, in summary, all of the relevant comparisons that can be made using the data in Table 1 are consistent with predictions based on the model depicted in Figure 2.

#### Other differences

Contrary to much previous research that has used smaller numbers of participants, the application of analysis of variance to these data indicate that several of the measures showed gender effects, and all of these comparisons favoured females. Thus, females were 2.2%SM more satisfied with life as a whole, and were significantly more satisfied with most personal life domains. They were also more satisfied with the economic situation even though the National Wellbeing Index showed no gender differences. Females also thought Australia was changing more for the better than men (a 2.1%SM difference). There was, however, no gender difference in perceptions of own life changing for the better or in social trust.

In order to study the gender difference in life as a whole more closely, the two distributions were each divided into deciles. The percentage of values within each decile is presented in Table 4. Here it can be seen that the major gender difference occurs within the range 70-90%SM, where there are more females in the higher decile (80-90%SM) and more males in the lower decile (70-80%SM). The possible reasons for this distributional difference will be discussed later.

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Insert Table 4 here

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In order to analyse age effects, seven age groupings were created from 18-25 to 76+ years. A number of age-related differences were found, again using analysis of variance. In terms of personal life domains the following patterns were evident: (a) The 36-45 year group was least satisfied with their future security; (b) The youngest 18-25 year group was least satisfied with their community connectedness and personal relationships; (c) The oldest 76+y group was least satisfied with their health, but this was predominantly caused by decreased satisfaction in males and there was no decrease in the Personal Index; (d) In general across the personal domains (with the exception of health) the 66-75 year group evidenced the highest level of satisfaction.

Other age-related differences were mainly non-significant. Exceptions were satisfaction with the specific issue of health services (lowest for the 30-55 year groups) and the feeling that one's own life is changing for the better. This showed a linear decrease with increasing age.

Subjective wellbeing differed between the accessibility groupings. In terms of the Personal Wellbeing Index, the moderate-low access group scored 3.2%SM higher than the high access group, while the accessible and highly accessible groups did not differ. In terms of national wellbeing, the composite index showed no accessibility group difference.

In order to further investigate the influence of accessibility on personal wellbeing, Table 5 presents the domain values for each of the three accessibility groups. Analyses of variance followed by Tukey tests revealed that the differences were restricted to the domains of relationships and community. In each case, both the moderate-low accessible and accessible groups had higher values than the highly accessible group. In terms of national wellbeing, the domain of 'economic situation' was higher by 2.6%SM for the high access group compared to the moderate-low access group. A similar difference was found for the specific issue of wealth/income distribution and feeling that one's own life is getting better

Further testing was undertaken to determine whether these domain differences were specific to people with low levels of satisfaction. That is, it is conceivable that the higher satisfaction for relationships and community for the less accessible groups are confined to the lower portions of each distribution. Perhaps the effect of being in less accessible areas is that people who would have had low satisfaction with connection to their community in the city, find



themselves much more satisfied with this aspect of their lives. People satisfied with their community connection in the city, on the other hand, find a similar level in the country.

In order to test this possibility the score distributions for both relationships and community were separately divided into equal thirds. The top and the bottom third were then constituted as separate groups, and a 2 (high/low satisfaction) x 3 (accessibility) analysis of variance was conducted for each of these two domains. However, neither analysis yielded a significant interaction term, so the differential environmental effects appear to be apparent throughout each distribution.

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Insert Table 5 here

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#### Impact of happy/sad event

The impact of a happy event on the Personal Index is shown in Table 6. In order to create approximately equal cell sizes, the low impact groups 1-6 were combined into a single group.

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Insert Table 6 here

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An analysis of variance applied across the five impact groupings for a happy event was significant ( $F(4,721)=12.968$ ,  $p=.000$ ). The two highest impact groups evidenced a level of personal wellbeing that was higher than the others (Groups 9 & 10 > Groups 6, 7 & 8).

A similar analysis applied to the impact of a sad event revealed no systematic trend in the data. While an analysis of variance was marginally significant ( $F(5,691) = 2.241$ ,  $p=.049$ ), post-hoc tests (Tukey) failed to detect significant group differences.

Given the gender differences in satisfaction, an Impact x Gender analysis of variance was run for both the happy and sad event groups. Neither was significant.

### Discussion

The data suggest that this first iteration of the Australian Unity Wellbeing Index has utility as a tool to measure the subjective wellbeing of populations. The items factor appropriately into Personal and National Indexes, show convergent validity with other wellbeing variables, and the two Indexes appear sensitive to differences in gender, age, and geographic location. However, the Indexes are not presented here as finished products. Rather, they are expected to evolve, as theory and data provide compelling reasons for change. The latest iteration of these Indexes can be obtained from the website of the Australian Centre on Quality of Life (<http://acqol.deakin.edu.au>).

These two Indexes, and the other survey questions, were designed to test predictions derived from the Theory of Subjective Wellbeing Homeostasis. It has previously been empirically established that the mean satisfaction score for 'life as a whole' is about 75 percent of the scale maximum (%SM) for Western populations, with a range of 70-80%SM (Cummins, 1998, 2001). This was confirmed, and homeostatic theory attributes this phenomenon to the automatic maintenance of a positive abstracted self. Here, it is proposed that the abstract sense of subjective wellbeing is under the constitutional control of personality. However, as satisfaction is evaluated in relation to items that are either more specific or less personal, the influence of homeostasis wanes and gives way to the influence of cognition. This understanding allows a number of propositions to be made as follows:

#### Proposition 1

*Provided that the homeostatic system is not placed under threat or defeated by powerful external forces, variations in life circumstances will have little influence on the most abstract-personal indicator, which is 'your life as a whole'. Thus, according to the model, differences between groups on this variable signal one of two things. Either the groups differ constitutionally or there is a substantial homeostatic threat operating at a group level.*

Most interesting in this regard is the finding that females scored 2.2%SM higher than males on 'life as a whole'. We can foreshadow that this difference was again present in a second survey conducted in September/October 2001, using a similar protocol to the one reported here. So this result appears to be reliable. Moreover, across the entire data analysis conducted

for this survey, the only difference recorded for this most abstract-personal variable was in relation to gender.

There are three possible explanations for this result. The simplest is that females are more willing to express satisfaction than males. This is certainly supported by the generally higher female satisfaction across the other measured variables, and particularly within the Personal Index where females scored higher on five of the seven domains. However, the pattern of satisfaction in Table 4 is difficult to explain in these terms. There is no obvious reason for females to express more satisfaction within the 80-90%MS range than elsewhere in the distribution.

The second explanation is that the male population of Australia is suffering some negative influence that is challenging homeostasis. Indeed, the pattern of difference shown in Table 4 is precisely that expected from a sample under threat, with a strong distributional peak in the decile immediately above 70%SM. According to homeostatic theory (Cummins, 2002), 70%SM represents the value which, on average, the homeostatic system most strongly defends. This causes a build-up of scores immediately above this point when homeostasis is challenged.

Against this interpretation are three observations. The first is that none of the other variables measured in this survey showed a gender difference. This is clearly evidence against some ubiquitous negative influence driving down male wellbeing in general. The second is the lack of any obvious source of such a negative force. The third is that the mean scores of both gender groups lie close to the middle of the normative range (male:  $73.6 \pm 20.3$ ; female:  $76.8 \pm 19.1\%$ SM). Samples under threat lie around the 70%SM mark.

The third explanation invokes a constitutional difference. That is, females are constitutionally more satisfied than males. For this explanation to have any credibility, evidence of such a gender difference must be available from other studies. However, such evidence is highly equivocal. Researchers rarely report that they have statistically examined their data for such gender differences and there seems to be tacit agreement in the literature that males and females do not differ in their levels of general life satisfaction.

Because of this empirical record, it seems likely that if gender differences in subjective wellbeing do exist they will be subtle and therefore easily masked by, for example, small sample sizes. Alternatively, such differences could be masked by the presence of a gender imbalance in some general negative experience (or the lack of some general positive experience) that discriminates against females.

An archival search through literature holdings within the Australian Centre on Quality of Life has yielded four studies that meet the following criteria: (a) A general population sample >2,000; (b) Separate female and male data on 'Satisfaction with life as a whole'. These studies and their findings are as follows:

- (i) Gove et al. (1983), USA, N=2,174, Scale 0-3: Females=75.3, Males=74.0 (+1.3% difference). No test of difference reported.
- (ii) Glatzer (1987), West Germany, N=2,067, Scale 0-10: Females=77.0, Males=78.0 (-1.0% difference). No test of difference reported.
- (iii) Mastekaasa (1992), Norway, N=6,214, Scale 1-7: Females=77.05±14.50, Males=75.47±15.40 (+1.58% difference). No test of difference reported. Our calculated  $t = 3.198$ ,  $p = .000$ .
- (iv) Schyns (1998), the aggregate of 42 countries, N=50,046, Scale 1-10: Females=66.22±22.07, Males 67.22±21.36 (-1.02% difference). No test of difference reported. Our calculated  $t=7.278$ ,  $p=.000$ .

These surveys are clearly mixed in their support for a gender difference. However, study (iv) can be dismissed for the present purpose. Both gender means lie well below 70%SM, as has been previously found when combining Western and non-Western population data (Cummins, 1998). This is indicative of substantial homeostatic failure and, as expected under such conditions, is associated with females having lower wellbeing than males due to social factors.

Considering the other studies, two of the three show a female advantage judged simply on the direction of the difference. Moreover, the only one of these that could be statistically tested (iii) demonstrated higher female satisfaction.

While these data are clearly equivocal, it must be emphasized that other sources of systematic variance would be expected to weaken any female advantage, as shown by Schyns (1998) above. For example, income, employment, and family responsibilities would all be expected to generally favour the wellbeing of males. In conclusion, it appears that we have established a reliable gender difference in the abstract-personal wellbeing of Australian respondents. Our tentative proposal that this may be based in constitutional differences will need to be confirmed by a more complex investigation that systematically excludes other causes.

Proposition 2

*The domain scores that comprise each Index will average to a lower score than their correspondingly more abstract 'life as a whole' or 'life in Australia'.*

Due to their higher degree of specificity, the domains have less 'value added' satisfaction from homeostasis. This was confirmed. Personal life as a whole yielded 75.5%SM vs. 73.5%SM for the Personal Index, while life in Australia yielded 69.8%SM vs. 57.1%SM for the National Index (Table 1).

Proposition 3

*The influence of homeostasis will decrease as items become less personal.*

The logic behind this is that subjective wellbeing homeostasis is purely concerned with maintaining a positive abstract-self. Thus, as evaluation targets become increasingly non-self-related, the influence of homeostasis decreases. This will generally be manifest as decreasing satisfaction as items become less proximal and more distal. The data are consistent with this proposition.

Proposition 4

*As evaluation targets become more specific they will evidence increased variability.*

As evaluation targets are selected that are less abstract and more specific, it becomes increasingly adaptive to rely on information derived from the environment, rather than homeostasis, to construct feelings of satisfaction. Because of this, the Personal Index domains will evidence variability derived from two sources. First, individual differences in personality

will introduce variability associated with the abstract set-point for wellbeing. Second, individual differences in experience will contribute variability due to the cognitive evaluative component. Thus, the model predicts a higher degree of variability within individual domains than within life as a whole.

This prediction was weakly confirmed. Within the Personal Index, 5/7 domains had a standard deviation higher than that for life as a whole, and the largest difference was 1.71%SM (with the domain of health). More convincing was a comparison against the national sub-domains (Table 1). Here, all three had a standard deviation that exceeded that for life as a whole. These values averaged 2.2%SM higher.

An alternative interpretation of these trends is that, as mean values drop towards 50%SM, the standard deviations rise due to reduced ceiling effects. However, this does not appear to be a valid explanation within this data set. For example, within the Personal Index, the two domain means that evidenced the greatest separation from one another were Personal Relationships (78.4%SM) and Community Connectedness (69.0%SM). Yet the magnitude of their respective standard deviations was actually in the same direction (21.22 vs. 20.84%SM) instead of the reverse, as would be predicted from ceiling effects.

Proposition 5

*The level of satisfaction with individual domains may exceed, lie within, or be less than the homeostatic range of 70 – 80%SM..*

Satisfaction with particular domains is dependent on both experiential and constitutional factors, as has been stated. Thus, the cognitive evaluation could, presumably, move the level of individual domain satisfaction outside the homeostatic range. In the case of the relationships domain, however, the constitutional influence may be a special case. It is generally reported within the literature that satisfaction with family and friends is higher than any other life domain (e.g. Campbell et al., 1976) and extraversion, which is proposed as one determinant of homeostasis, is the personality dimension that directs sociability. So it may be that the high satisfaction accorded to this domain reflects a pre-disposition to value this life domain over and above the homeostatic set-point.

In summary, there does seem to be a high degree of concordance between the homeostatic model that has been proposed and the data. Moreover, at a teleological level of argument, such an arrangement seems highly adaptive. The homeostatic system is responsible for the maintenance of satisfaction with the abstract self at a level that provides a generalised level of wellbeing and motivation for living. However, humans must also be sensitive and responsive to their environment, so as the items to be evaluated become less abstract, the evaluation process starts to involve cognition, and satisfaction becomes a composite of both experience and the homeostatic glow.

### Age related changes

A notable result was the lack of any major differences in personal wellbeing between the age groups. This is consistent with a large body of literature (e.g. Flanagan, 1978; Fugl-Meyer, Branholm & Fugl-Meyer, 1991; Zautra, 1983; Myers & Diener, 1995; Diener et al., 1999) and attests to the resilience of elderly humans as they experience deteriorating circumstances of living. This is also consistent with homeostatic theory. However, some differences were found, and these provide insight into the negative forces operating at various ages that can threaten homeostasis.

The youngest 18-25 year group was least satisfied with their community connectedness and personal relationships. This suggests a degree of alienation and isolation which, as Eckerseely (1998) points out, may well be linked to the disturbingly high incidence of psychosocial disorder within this age group.

Then as people mature into middle-age, other negative forces prevail. We found the 36-45 year group to have reduced satisfaction with their future security, which probably translates to financial security for many people. In an environment of high job uncertainty, with short-term contracts becoming commonplace and several recent collapses by major corporations, this is not surprising. When such insecurity is combined with substantial house mortgages and teenage children (see Field, 1981), it is not surprising that homeostasis is threatened. In a similar vein, Mastekaasa and Moum (1984) reported that in Norway, their 45-50 year group evidenced the lowest level of subjective wellbeing.

Elderly people, as has been stated are resilient. However, the members of this group are particularly vulnerable to homeostatic defeat if their life circumstances become too difficult,

and it is notable that satisfaction with health was lower than normal for the oldest 76+ year group. This was most particularly evident for males, and the association between reduced health and wellbeing among elderly people has been commonly reported (e.g. Stolar, Macentee & Hill, 1992).

#### Geographic location

People living in rural Australia reported higher personal wellbeing than people living in cities, but the reverse was true for the National Index. The former difference is a result that requires replication. The literature clearly indicates there is no necessary advantage to personal wellbeing through rural living, and reports can readily be found indicating it is advantageous (e.g. Opping, Ironside & Kennedy, 1988), disadvantageous (Fischer, 1973; Haavio-Mannila, 1971), or that it makes little difference (Best, Cummins & Lo, 2000). On this occasion, however, the result does appear to be robust, since it was neither influenced by gender nor people's level of satisfaction with community or relationships.

The reduced satisfaction with national life has a ready explanation in the profound changes in rural Australia over the past two decades – industry restructuring, economic hardship, reduced government and business services, declining opportunities and populations, and greater cultural marginalisation. It seems likely that people living in these regions hold the Federal Government responsible for these trends.

#### Impact of life events

Towards the end of the interview, people were asked whether or not they had recently experienced an event that currently made them feel happier or sadder than normal. A majority of people (71%) claimed to have such an experience, and these were almost evenly divided into those who felt happier (36%) and those who felt sadder (35%). The effect of feeling happier was reflected in a higher Personal Index score for those who rated the strength of the increase either 9 or 10 on the 10-point scale. This seems like an intuitively reasonable result which confirms the validity and the sensitivity of the Personal Index (Table 6). The result of people feeling sadder, however, was very different (Table 7). Here, the strength of the impact had no differential effect, with the impact groups all registering a score between 65 to 71%SM.



While this result may seem surprising, it is consistent with previous findings. As has been stated, Cummins (1995, 1998) proposed that 70%SM constitutes the lower margin of the homeostatic range for group mean values in Western nations. He has also argued (Cummins, 2002) that 70%SM represents the average value at which the homeostatic system exerts its strongest defence. That is, in a system under threat, 70%SM constitutes a point of resistance against further decreases in SWB. In this context it is notable that the mean values across the six impact groups in Table 7 average to 68.5%SM.

This is not only consistent with the theory as presented but also seems reasonable in terms of the homeostatic threat that is involved. It can be assumed that the event to which most people refer happened some days or weeks before the interview. Consequently, the homeostatic processes of adaptation would have had time to exert some control over the situation, and succeeded to the extent of restoring wellbeing to around 70%SM. In this context it is also interesting to observe from Table 7 that there is a steady rise in the standard deviation as the impact strength increases. This is consistent with increasing numbers of individuals experiencing homeostatic defeat, thereby causing the distribution to become increasingly platykurtic and generating increased variance, as has been previously argued (Cummins, 2002).

In conclusion, this paper has extended the Homeostatic Theory of Subjective Wellbeing. Further surveys of the Australian population using the Australian Unity Wellbeing Index are now planned to occur at six month intervals. We hope to use these future data to confirm and extend the understanding that has so far been achieved.

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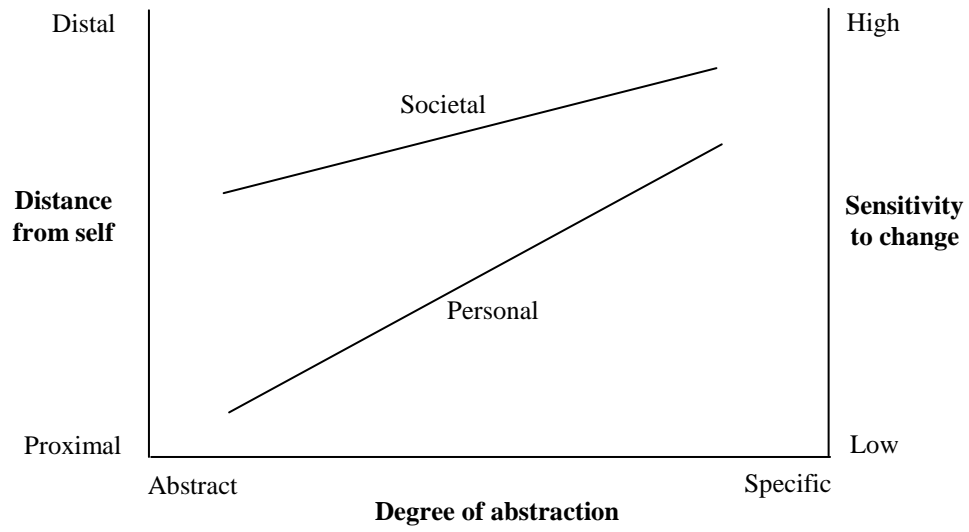


Figure 1. Sensitivity to change.

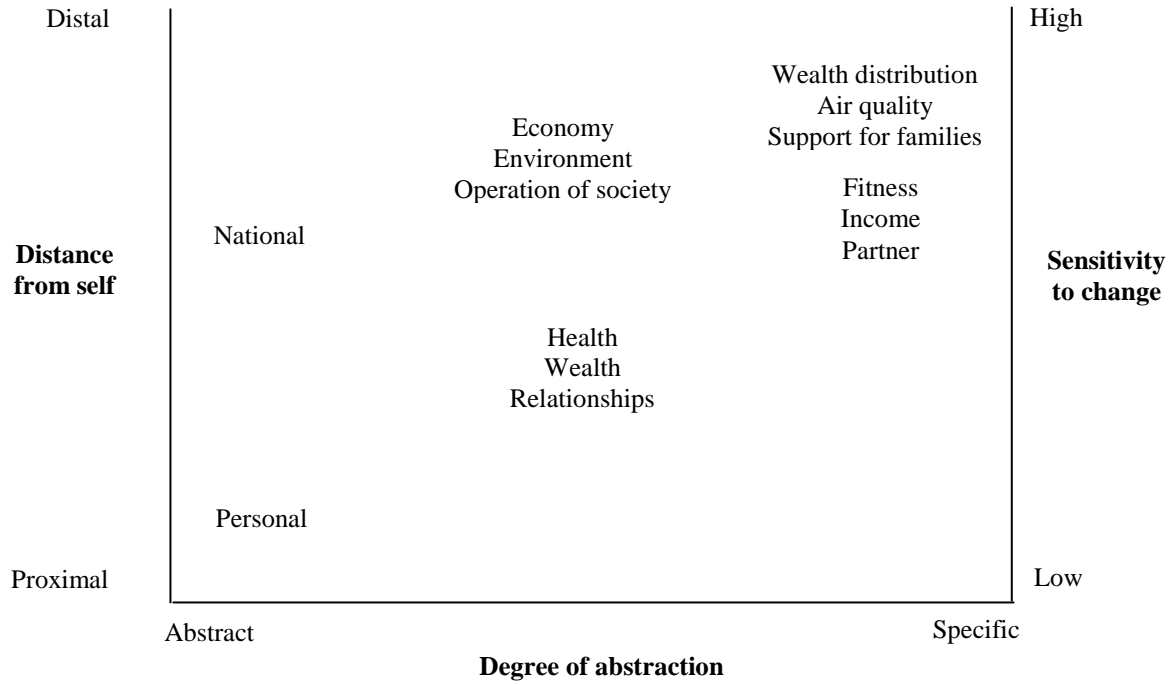


Figure 2. Bi-dimensional model of subjective wellbeing sensitivity to external forces of change

Table 1

Means and standard deviations (%SM)

<b><u>Personal Wellbeing</u></b>	Mean	(SD)	<b><u>Domain Inter-correlations</u></b>						
Life as a whole	75.48	(19.67)							
<b><u>Personal Life domains</u></b>			<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	
1. Standard of living	75.78	(19.50)	-						
2. Health	73.97	(21.38)	.39***	-					
3. Achieve in life	73.48	(18.51)	.47***	.36***	-				
4. Personal relationships	78.44	(21.22)	.34***	.25***	.40***	-			
5. How safe you feel	75.40	(20.25)	.32***	.29***	.23***	.21***	-		
6. Community connectedness	68.98	(20.84)	.37***	.26***	.38***	.27***	.32***	-	
7. Future security	69.29	(21.24)	.51***	.36***	.46***	.30***	.41***	.45***	
<b>Personal wellbeing index</b>	73.48	(13.57)							
<b><u>National Wellbeing</u></b>									
Life in Australia	69.79	(21.02)	<b><u>Domain Inter-correlations</u></b>						
<b><u>National life domains</u></b>			<b>1</b>	<b>2</b>					
1. Economic situation	53.80	(20.36)	-						
2. State of the environment	58.17	(19.56)	.46***	-					
3. Social conditions	59.44	(20.03)	.53***	.58***					
<b>National wellbeing index</b>	57.14	(16.52)							
<b><u>Sub-domain Inter-correlations</u></b>									
<b><u>National Sub-domains</u></b>			<b>1</b>	<b>2</b>					
1. Wealth/income distribution	48.07	(23.00)	-						
2. Health services	58.10	(22.23)	.49***	-					
3. Family support	59.32	(20.38)	.50***	.59***					
<b><u>Social Capital</u></b>									
4. Trust in people	56.84	(20.50)							
<b><u>Trends</u></b>									
1. Own life changing for the better	64.00	(19.34)							
2. Australia for the better	53.02	(19.95)							



Table 2

Correlation of indices and other measured variables

	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>
1. Life as a whole	-					
2. Personal wellbeing index	.67	-				
3. Australia as a whole	.28	.36	-			
4. National wellbeing index	.30	.44	.56	-		
5. Social capital	.25	.38	.31	.40	-	
6. Own life changing	.36	.43	.30	.31	.29	-
7. Australia changing	.18	.29	.41	.51	.32	.40

Note: All correlations are significant at  $p < .001$

Table 3  
Prediction of other variables by the index domains

Personal Index	Dependent Variable											
	A		B		C		D		E		F	
	$\beta$	sr <sup>2</sup>	$\beta$	sr <sup>2</sup>	$\beta$	sr <sup>2</sup>	$\beta$	sr <sup>2</sup>	$\beta$	sr <sup>2</sup>	$\beta$	sr <sup>2</sup>
Standard of living	.32***	6.4	.15***	1.4	.14***	1.2	.06*	0.2	.13***	1.0	.12***	0.9
Health	.14***	1.5	.08**	0.5	.11***	1.0	.08***	0.5	.10***	0.7	.07**	0.3
Achievement	.20***	2.7	-.02	0.0	.01	0.0	-.00	0.0	.04	0.0	.02	0.0
Relationships	.19***	2.9	-.01	0.0	.01	0.0	-.01	0.0	.02	0.0	-.02	0.0
Safety	.02	0.0	.08**	0.5	.08**	0.5	.12***	1.1	.06*	0.3	.06*	0.3
Community	.08***	0.5	.11***	0.9	.11***	0.9	.15***	1.6	-.02	0.0	.10***	0.7
Future security	.10***	0.5	.11***	0.6	.19***	2.0	.14***	1.0	.16***	1.5	.14***	1.1
R	.73***		.38***		.46***		.40***		.46***		.32***	
Adjusted R <sup>2</sup>	.52		.14		.21		.16		.21		.10	
Unique variability	14.5%		3.9%		5.6%		4.4%		4.6%		3.5%	
Shared variability	37.7%		10.1%		15.4%		11.6%		16.4%		6.5%	
<b>National Index</b>												
Economic situation	.20***	2.6	.31***	6.5	.24***	4.0	.25***	4.3	.21	2.9	.30***	6.2
State of environment	.09**	0.5	.06***	0.3	.12***	1.0	.07*	0.3	.04	0.1	.14***	1.2
Social conditions	.09**	0.4	.30***	5.3	.16***	1.5	.17***	1.7	.13***	0.9	.19***	2.0
R	.58***		.31***		.46		.41***		.32***		.52***	
Adjusted R <sup>2</sup>	.33		.10		.21		.17		.10		.27	
Unique variability	12.1		3.5%		6.5%		6.3%		3.9%		9.4%	
Shared variability	20.9		6.5%		14.5%		10.7%		6.1%		17.6%	

Key

A = Life as a whole; B = Life in Australia; C = National Index (top) and Personal Index (below); D = Social capital; E = Own life changing; F = Australia changing  
 sr<sup>2</sup> = Percentage of unique variance

Table 4

Gender distribution for life as a whole

<b>%SM Decile</b>	<b>Male %</b>	<b>Female %</b>	<b>Male – Female</b>
100 – 90	7.5	8.7	-1.2
89 – 80	20.2	28.4	-8.2
79 – 70	35.8	30.4	+5.4
69 – 60	21.2	19.7	+2.0
59 – 50	7.7	8.5	-0.8
49 – 40	3.7	2.6	+1.1
39 – 30	3.9	1.6	+2.3

Table 5

Domains and accessibility in %SM units

<b>Personal Index</b>	<b>Highly Accessible</b>		<b>Accessible</b>		<b>Moderate-Low Accessible</b>		<b>% Difference referenced to Highly Accessible</b>	
	(N=250)		(N=205)		(N=152)		Accessible	Moderate-Low
	Mean	SD	Mean	SD	Mean	SD		
Standard of Living	75.40	19.26	74.00	20.35	76.51	20.76	-1.4	+1.1
Health	75.40	21.20	71.22	22.97	74.87	23.64	-4.2	-0.5
Achievements	73.56	19.34	76.34	18.17	75.20	18.66	+2.8	+1.6
Relationships	76.12	22.53	82.15	18.82	81.78	20.78	+6.0**	+5.7**
Safety	75.08	20.93	78.34	19.98	78.75	19.81	+3.3	+3.7
Community	66.96	20.91	73.32	19.45	76.84	21.33	+6.4**	+9.9**
Future Security	69.96	21.39	69.76	20.25	70.33	24.01	-0.2	+3.7
<b>Mean (Index)</b>	73.88	12.92	75.88	12.35	77.07	13.79	+2.0	+3.2

Table 6

Impact of events on personal wellbeing

Impact of a happy event				Impact of a sad event			
Impact Group	N	Mean	(SD)	Impact Group	N	Mean	(SD)
				4 or less	130	67.97	(15.93)
6 or less	121	72.77	(10.80)	5	102	69.21	(14.56)
7	140	73.97	(9.46)	6,7	146	71.40	(13.46)
8	189	76.02	(10.75)	8	122	65.27	(16.76)
9	102	79.75	(9.57)	9	82	66.90	(17.69)
10	174	79.97	(11.54)	10	115	69.07	(17.56)
Total	726	76.55	(10.90)	Total	697	68.46	(15.99)