The Subjective Wellbeing of High-School Students: Validating the Personal Wellbeing Index—School Children

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Abstract The Personal Wellbeing Index—School Children (PWI-SC) is designed as a parallel form of the adult PWI-A, to measure subjective wellbeing. This study examines the psychometric properties of the PWI-SC. Data from 351 students, aged between 12 and 20 years, were collected by two independent studies over the years 2005–2006. Using the combined data, the results indicate good psychometric properties for the PWI-SC. It is also found that females have higher SWB but that both genders show an age-related decline in SWB from early to mid adolescence. Notably, School satisfaction meets the criteria for a new domain for the PWI-SC and should be considered for inclusion in a future revision of the scale. The use of the PWI-SC in schools can provide important information for the development of educational policy.

Keywords Subjective wellbeing · Adolescents · Personal Wellbeing Index · High-school · Students

1 Introduction

Subjective Wellbeing (SWB) is a broad construct which can be conceptualised and measured in a variety of ways. It is therefore no surprise to find that the number of instruments which purport to measure SWB and like constructs is very large. In fact, the Australian Centre on Quality of Life lists over 1000 instruments for this purpose (acqol.deakin.edu.au). One instrument with both theoretical and empirical credentials is the Personal Wellbeing Index (PWI: International Wellbeing Group 2006).

The PWI generates a composite variable, calculated by averaging satisfaction scores on 8 life domains. Each domain represents a relatively abstract area of life as satisfaction with

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standard of living, health, achieving in life, relationships, safety, community-connected-ness, future security, and spirituality/religiosity. These eight domains are theoretically embedded, in that they are designed to represent the first level deconstruction of the global question: 'How satisfied are you with your life as a whole?' Domains are included on the basis that each contributes unique variance when regressed together against global life satisfaction. The combination of unique and shared variance contributed by these eight domains in adults typically accounts for approximately 50–60% of the variance in global life satisfaction in Australia and overseas (International Wellbeing Group 2006). However, it should be noted that both the 'Safety' and the 'Spiritual/Religious' domains rarely make a unique contribution in adult Australian samples. They are retained, however, because they do make a contribution in other countries (Wills 2009).

1.1 Subjective Wellbeing Stability

One of the most interesting findings in the SWB literature is that it is not free to vary over the entire range of values offered by a particular measurement instrument. Rather, SWB is held around a 'set-point' and is remarkably stable across time (Cummins 1995; Headey and Wearing 1989, 1992; Eid and Diener 2004; Schimmack et al. 2002). This stability has been observed at both the level of individuals (Hanestad and Albrektsen 1992; Headey and Wearing 1989) and populations. The 21 surveys conducted on the Australian population over the years 2001–2009 reveal that the mean level of SWB varied by just 3.1% points over that period (Cummins et al. 2009), from 73.5 to 76.6% points.

Headey and Wearing (1989, 1992) were amongst the first authors to suggest that individuals may have a 'set-point' level of SWB that is determined by personality. However, more recently, Headey (2010) revisited his earlier work in an attempt to explain why over a 20 year period, 14–30% of German Socio-Economic Panel members recorded large and apparently permanent shifts in self-reported life satisfaction. He now challenges the view that personality is a stable trait and states that personality may change in adulthood and those changes in SWB over time may correspond with changes in personality. For example, an upward shift in SWB can be explained by increased extraversion and decreased neuroticism in adulthood. The view that set-point theory needs revision is shared by Diener et al. (2006) who also noted apparent medium and long term change in set-points in the German panel data. However, as argued by Cummins (2010), there is another possible reason for such marked changes, as people whose SWB is moving in and out of homeostatic defeat.

1.2 Subjective Wellbeing Homeostasis Theory

In 1995, Cummins suggested that SWB stability may be due to homeostatic devices that are actively maintaining SWB around its set-point. Analogous to the homeostatic main-tenance of body temperature, Subjective Wellbeing Homeostasis Theory proposes that the purpose of homeostasis is to defend the affective core of SWB, which is proposed to be a stable, genetically endowed, positive mood (Davern et al. 2007). This mood is termed Homeostatically Protected Mood (HPMood: Cummins 2010) and it is protected by both external and internal buffers.

The external buffers are the resources, such as wealth and supportive relationships that can be used to defend against homeostatic challenges, such as may be delivered by ill health or disappointment. For example, wealth may be used to purchase the best medical treatment while discussing a disappointing event with a supportive partner will dull the

sense of loss. The internal buffers comprise a system of cognitive devices that include self-esteem (Cummins and Nistico 2002); perceived control (Thompson et al. 1998); and optimism (Peterson 2000). These buffers maintain a positive sense of self through cognitive restructuring, which converts a negative experience (having lost some money) into positive thoughts concerning the self ('I did not really need it').

Together, these external and internal buffers maintain SWB within a set-point-range, which is probably some 10–12 points in extent. However, under severely threatening circumstances (e.g., losing one job or divorce), if the strength of the challenge exceeds the capacity of the homeostatic system to defend HPMood, homeostasis will forfeit control to the challenging agent, resulting in a drop in positive mood and a high probability of depression. For a more detailed account of homeostasis see Cummins (2010). The failure of homeostasis is an alternative explanation for the large individual changes in SWB noted earlier by Headey.

The presence of homeostasis also explains why there is normally such a poor correlation between objective and subjective QOL indicators (e.g., Cummins 2000; Diener et al. 1999; Headey and Wearing 1992; Ng 1997). As the objective indicators change, it is the role of homeostasis to hold SWB steady. It also explains why the population mean for SWB is so stable. Most people sampled are experiencing a level of SWB within their set-point-range.

Importantly for the present research, these past investigations and the on-going results coming from the Australian Unity Wellbeing Project (Cummins et al. 2009) point to the value of approximately 70 points as representing the normative lower limit of normality for group mean scores. That is, group mean scores that lie below 70 points are indicative that the group contains a higher than normal proportion of people who are experiencing homeostatic failure and are therefore at risk of depression. This is an indication that the average level of demands within a sample exceeds the average level of resources which can be mustered to defend the normal functioning of homeostasis.

1.3 Subjective Wellbeing of High-School Students

To date, there is little research in Australia that describes the characteristics of SWB amongst Australian high-school students. This is an important issue because a significant proportion of Australian youths suffer some form of mental health problem. For example, Sawyer et al. (2000) estimate that among adolescents aged 13–17 years, 14% could be classified as having mental health issues as measured using the Child Behaviour Checklist (Achenbach 1991). Similarly, among American youth aged 12–18 years, Keyes (2006) found not only a relatively high proportion with mental health problems but also that the incidence of such problems rose with age. This latter, very worrying result, has been replicated in Spain by Casas et al. (2009a) using measures of SWB. These authors also found wellbeing declined between 12 and 16 years showing that older adolescence is a time of great physical, social and psychological change.

The implications of this decreasing wellbeing as adolescents age is shown through the associations between mental health, satisfaction at school and Subjective Wellbeing (e.g., Baker 1999; Huebner et al. 1999; Jin and Moon 2006; Suldo and Huebner 2004). Quite clearly, difficulties with mental health are associated with difficulties in scholastic achievement and social development.

Adolescence is an intensive period of development and difficulties encountered during his time have important implications for adulthood. At the heart of understanding adolescent mental health is the valid and reliable measurement of SWB for this age-group. It is also important to identify sub-groups within this population who may be considered

'at-risk' for depression to ensure adequate provision of support and resources to those in need.

1.4 Summary and Study Aims

To date, there are no published data on SWB for Australian adolescents. Thus, this study aims to (a) describe the characteristics of SWB amongst Australian adolescents (b) investigate the psychometric properties of the Personal Wellbeing Index—School Children (PWI-SC) (c) determine the domains that are most important to high-school students and (d) determine whether 'School Satisfaction' meets the criterion for a new domain within the PWI-SC.

2 Methodology

2.1 Participants

The 351 participants, recruited across two studies conducted in 2005 and 2006, were attending various high-schools in the Melbourne metropolitan region (76%), Geelong (19%) and country Victoria (4%). The combined sample comprised 119 males (34%) and 234 females (66%), representing 51 students in year 7 (14.5%), 25 students in year 8 (7.1%), 25 students in year 9 (7.1%), 78 students in year 10 (22.2.0%), 72 students in year 11 (20.5%) and 100 students in year 12 (28.5%). Ages ranged from 12 to 20, with a mean age of 15.70 years (SD = 1.75 years).

2.2 Questionnaire

A paper and pencil questionnaire titled *The Young Australian Wellbeing Index* was self-completed by each student, under conditions of information privacy, in their regular classroom. Four items obtained demographic information on age, sex, year level at school and post-code of residence; and the remainder of the questionnaire comprised scales measuring life satisfaction, subjective wellbeing, homeostatically protected mood, school satisfaction, personality, self-esteem, optimism and perceived control. Students responded to all scale items using an 11 point, end-defined scale.

2.3 Major Dependent Variable and Other Variables

2.3.1 Life Satisfaction (LS) and Subjective Wellbeing (SWB)

The measure of life satisfaction (LS) is a single-item that asks 'How satisfied are you with your life as a whole' (0 = Very Dissatisfied; 5 = Neutral; 10 = Very Satisfied).

  The Personal Wellbeing Index-School Children (PWI-SC; Cummins and Lau 2005) measures SWB and is a parallel version of the PWI-Adult (International Wellbeing Group 2006). It comprises seven items (domains) of satisfaction, selected to represent the first level deconstruction of satisfaction with 'life as a whole'. The wording of some domains differs from the adult scale in a way to make them easier to comprehend. This study included a new item on satisfaction with School. This item meets the criteria for being considered as a new domain, as set-out in the manual. Specifically, it must be evidenced

through multiple regression analysis that a proposed new domain explains significant unique variance in LS above the existing domains. The manual for the adult version reports good internal reliability for the PWI-A (Cronbach's α between .70 and .85). In the present study it is .82 using the existing 7 domains and .83 with the inclusion of the proposed eighth domain, school satisfaction.

2.3.2 Homeostatically Protected Mood (HPMood)

This was measured by three affective adjectives as 'Happy', 'Content' and 'Alert'. Participants responded to each item as follows: 'Please indicate how each of the following describes your feelings when you think about your life in general: How… (insert affective adjective)… do you generally feel?' (0 = Not At All; 10 = Extremely). Chronbach's alpha for these three affect items was high (Cronbach's α = .82) and a single composite variable was computed.

2.3.3 School Satisfaction

As all research participants attend high-school, a single item measuring satisfaction with school was included to determine whether this item fulfilled the criteria for a new domain within the PWI-SC.

2.3.4 School Index

A further 9 items adapted from the Piers-Harris Children's Self-Concept Scale (Piers 1986) were included in the second study. These items were designed to tap levels of satisfaction with various aspects of school life. Examples include 'How satisfied are you with your abilities at school' and 'How satisfied are you with your teachers at school'. Cronbach's α for these 9 items was high at .87.

2.4 Other Measures

The questionnaire also included a number of scales measuring constructs not explored in this manuscript. These included Rosenberg's self-esteem scale (Rosenberg 1989); The Life Orientation Test—Revised (LOT-R; Scheier et al. 1994) as a measure of optimism; The Personal Perceived Control Scale (PPCS; Holloway 2003, unpublished thesis); the Ten-Item-Personality-Inventory (TIPI; Gosling et al. 2003) comprising four items measuring the constructs extraversion and neuroticism (reverse coded as emotional stability); and Multiple Discrepancies Theory (Michalos 1985).

3 Procedure

Data were collected as part of two independent studies carried out in 2005 and 2006. The procedure for both studies was the same. After obtaining approval from the Deakin University Ethics Committee, approval was sought from the Department of Education and Training and The Catholic Education Office. Approval from these organisations must be obtained prior to conducting research in government and Catholic high-schools. Following

receipt of approval, the first author, who conducted the interviews, was required to undergo a background police check. This is a requirement when entering Victorian schools.

Once these authorities had given their approval, various high schools in the Melbourne metropolitan region, country Victoria and the regional city of Geelong were contacted either by phone or e-mail. A representative from each school was briefed on the proposed study, its aims, obligations as a participating school, and responsibilities of the researcher. Of the 27 schools contacted, seven agreed to take part in the study.

Following approval by school authorities, potential research participants were handed parent/guardian consent forms. Students who returned signed forms were then handed participant consent forms and, at the time of distribution, were informed as to the nature of the study. These described their obligations as a participant (such as time commitments), the procedure for returning the anonymous questionnaires upon completion, and their right to withdrawal their participation at any time.

Each student who volunteered to participate then received an envelope containing a plain language statement and a questionnaire. Participants were given time in class to complete their questionnaire, seal it in the envelope provided, and return it to either the first author or the classroom teacher (whoever was present). In the latter situation, questionnaires were mailed by the teacher to Deakin University. Upon completion of the study, participants had the opportunity for debriefing and to obtain a copy of the results. The participation rate is not known.

4 Results

4.1 Data Screening and Preliminary Analyses

SPSS software (version 17.0, 2008) was used for data screening and analysis. To standardise data, all reported values have been converted to a Percentage of Scale Maximum (%SM) which converts data onto a 0–100 scale. %SM is calculated through the formula presented in the PWI Manual as:

$$\frac{X - k^{\min}}{k^{\max} - k^{\min}} \times 100$$

X = the score or mean to be converted, $k^{\min}$ = the minimum score possible on the scale, $k^{\max}$ = the maximum score possible on the scale.

SPSS frequency output revealed that the frequency of missing data for all variables across the entire data set was less than 5%. As recommended by Tabachnick and Fidell (2001), given that missing data appeared random, missing values were replaced by regression.

Examination of z-scores revealed univariate outliers on domain satisfaction variables. Comparison of mean scores on these variables with corresponding means trimmed at the upper and lower 5% showed that none of these outliers significantly influenced mean scores on key variables. As a consequence, univariate outliers were included in analyses (Pallant 2001). 13 multivariate outliers were identified with a Mahalanobis distance greater than $x^2 = 26.125$, a criterion recommended by Tabachnick and Fidell (2001) for the corresponding degrees of freedom, and these 13 cases were removed leaving a total of 338 cases for analysis.

According to Cohen and Cohen (1983), skewness and kurtosis are acceptable within the range of −7.0 to 7.0. Skews greater than ±7.0 were found in the PWI domains of relationships ($z = -7.40$) and safety ($z = -8.0$). Thus, these variables underwent a log transformation to reduce Skewness back within the acceptable range.

The highest observed correlation was between LS and achievements ($r = .59$). Thus, no multicollinearity and singularity exists in the data set.

According to Tabachnick and Fidell (2001), the criterion for multiple regression analysis is:

$$N \geq 50 + 8m$$

where N = minimum number of cases and m = number of IV's.

In this study, the maximum number of independent variables entered in any one regression analysis is 8. According to this rule, it is recommended that a minimum of 114 cases are needed for adequate statistical power. With 338 cases the present study adequately meets the power requirements for all major analyses.

4.2 The Subjective Wellbeing of Australian Adolescents

As there are no normative data for the SWB of Australian high-school students, Fig. 1 shows the comparison of student data against normative ranges for adults on the PWI and domains. In this figure, the vertical shaded bars show the normal range for the PWI and each domain. Normative data are based on using survey mean scores ($N = 21$) as data (Cummins et al. 2009). Each shaded bar represents two standard deviations around the grand mean. The thin vertical lines represent the mean scores for the adolescents ($N = 338$).

It can be seen that the student mean of 74.7 points just falls within the adult range, thereby confirming the first hypothesis. The majority of domains are not significantly different from the adult ranges. However, satisfaction with Achieving in life is significantly below the normative range for adults $t(41996) = 3.876$, $p < .001$; while community connectiveness is significantly above the normative range for adults $t(43971) = 2.9429$, $p < .05$.
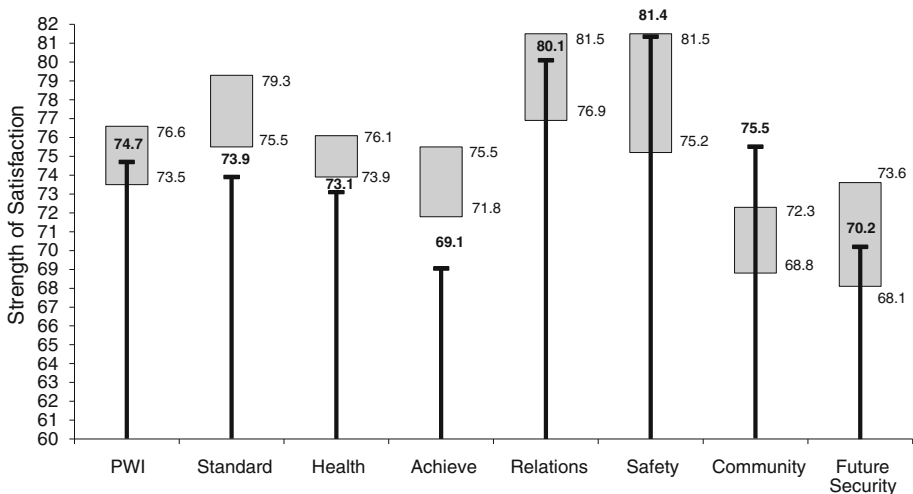

Fig. 1 The relationship between the PWI, domain-satisfactions and normative adult data

Table 1 PWI-SC ratings by gender

PWI-SC domains	Male (n = 112)		Female (n = 226)		M1 − M2
	M1	SD	M2	SD	
Standard of living	70.36	20.18	75.53	18.67	−5.17
Health	71.88	20.73	73.27	20.35	−1.40
Achieving	67.50	19.20	69.56	18.06	−2.06
Relationships	77.77	17.12	81.38	16.41	−3.62
Safety	78.84	18.64	82.34	16.64	−3.50
Community	67.95	21.48	79.61*	18.87	−11.66
Future	65.89	21.58	72.43*	17.71	−6.54
PWI total	71.45	14.41	76.30*	12.17	−4.85

* $p < .01$

4.3 Gender, Age and SWB

A series of Independent samples t-tests was conducted to investigate gender differences as shown in Table 1. To adjust for multiple comparisons, a Bonferroni correction was used and a more stringent alpha value applied ($p < .01$) to test for the significance of difference between group mean scores.

The overall SWB for females is higher than for males $t(336) = -3.240$, $p < .001$, Females were also higher on 'Community', $t(336) = -5.104$, $p < .001$, and 'Future', $t(336) = -2.967$, $p < .01$,

A series of One-way Analyses of Variance investigated age differences within each domain as shown in Table 2. Some age groups have been combined to ensure an adequate cell size.

In terms of SWB, there is a significant main effect for age, $F(3, 337) = 5.028$, $p < .01$, with 12 and 13 year olds scoring highest. They also score slightly, but not significantly, above the adult normative range. In contrast, 16 year olds scored significantly lower than the adult normative range, $t = 2.55$, $p < .05$. These results will be discussed.

Table 2 PWI-SC ratings by age

PWI-SC domains	12 and 13 (n = 54)		14 and 15 (n = 87)		16 (n = 68)		17 and 18 (n = 129)	
	M1	SD	M2	SD	M3	SD	M4	SD
Stand of living	83.33	15.17	77.70	18.22	67.97	18.75	70.38	19.79
	>16, $p < 01$		>16, $p < 01$					
	>17 and 18, $p < 01$		>17 and 18, $p < 05$					
Health	77.96	17.63	75.75	18.65	68.99	21.22	71.05	20.83
Achieving	71.85	17.81	72.07	18.44	61.45	18.33	68.72	18.07
	>16, $p < 01$		>16, $p < 01$				>16, $p < 05$	
Relationships	84.38	16.43	81.45	16.56	72.46	17.69	80.53	16.48
	>16, $p < 01$		>16, $p < 01$				>16, $p < 01$	
Safety	82.93	13.88	83.10	16.73	75.36	21.60	80.98	17.75
			>16, $p < 05$					
Community	71.61	23.19	73.28	20.58	75.22	21.80	78.27	18.36
Future	73.15	17.36	70.46	19.82	65.51	20.26	70.68	19.12
PWI total	77.88	11.25	76.25	13.72	69.56	13.86	74.37	12.85
	>16, $p < 01$		>16, $p < 01$					

A number of significant main effects for age are also observed for the domains. These follow the same trend, with the younger groups scoring higher.

A two-way ANOVA was conducted to determine the effect of age and gender on SWB. Age groups were been combined (12–15 years and 16–18 years) to ensure adequate cell size. Levene's test, which assesses the equality of variances between groups was assumed ($p > .05$), and no interaction effect between age and gender was observed.

4.4 Evaluation of the PWI-SC Using Principal Component Factor Analysis

A Principal Component Factor Analysis evaluated the factor structure of the PWI-SC. The presence of multiple coefficients greater than .3, a significant chi-square for Bartlett's Test of Sphericity and a Keiser–Meyer–Oklin (KMO) value greater than .6 (KMO = .867) (Pallant 2001) indicated that the data are suitable for factor analysis. Only one factor emerged with an eigenvalue greater than 1, explaining 48 percent of variance. This is the structure intended by the scale developers and the factor loadings ranged from .53 (Community) to .76 (Health).

4.5 School Satisfaction as a Unique Construct

The domains of the PWI have been chosen because they are intended to represent the first-level deconstruction of satisfaction with life as a whole (LS). Thus, each domain should to explain significant unique variance in LS. This study included a putative new domain as School satisfaction. Whether this meets the criterion for a new domain was tested by hierarchical multiple regression.

As expected, all domains share considerable variance, both with one another (.24–.55) and with LS (.27–.59). The new putative domain also correlated significantly with all existing domains (.16–.44) and with LS (.47).

Results of the regression analysis are presented in Table 3. This shows the standardised regression coefficients (β), squared semi-partial correlations (sr^2) as a measure of unique variance, adjusted R^2 and unique and shared variance. The original seven domains are entered at step 1 and school satisfaction at step 2.

The R for step 1 of this regression is significantly different from zero, $F(7, 331) = 52.091$, $p < .001$. Five domains contributed significant unique variance to the prediction of LS as *standard, health, achieving, safety* and *future*. Altogether, 51% of the variability (adjusted) in LS can be predicted from these five domains. In support of the fourth hypothesis, when entered at step 2, satisfaction with school accounted for an additional 1.0% of the variance, $\Delta R^2 = .01$, $F_{inc}(1, 330) = 6.046$, $p < .05$. Thus, satisfaction with school meets the criterion for a new domain.

Interestingly, at step 2, school satisfaction appears to have captured unique variance from the domains of standard and achieving, and the overall explained unique variance has decreased by 1.5%. In compensation at step 2, shared variance has risen by 2.5% and this has caused the overall variance to rise by 1% (from 51 to 52%). It appears that school satisfaction is cutting across the other domains, causing more of their variance to be shared.

4.6 Predicting School Satisfaction

Nine items were included in the second study questionnaire to allow an exploration of school satisfaction composition in terms of its deconstruction. These 9 items were adapted from the Piers-Harris Children's Self-Concept Scale (Piers 1986) and correlated at between

Table 3 Predicting LS using 7 PWI domains and satisfaction with school

	Adj. R^2	ΔR^2	β	sr^2
Step 1				
Standard of living			.23***	.04
Health			.13*	.01
Achieving			.28***	.05
Relationships			.08	.00
Safety			.18***	.02
Community			−.01	.00
Future			.10*	.01
	.51			
	Unique variance = 13.0%			
	Shared variance = 38.0%			
Step 2				
Standard of living			.20***	.03
Health			.13**	.01
Achieving			.26***	.04
Relationships			.06	.00
Safety			.16***	.02
Community			.00	.00
Future			.09*	.005
School satisfaction			.11*	.01
	.52	.01*		
	Unique variance = 11.5%			
	Shared variance = 40.5%			

* $p < .05$; ** $p < .01$; *** $p < .001$

Table 4 Predicting satisfaction with school ($N = 205$)

Variable	DV: satisfaction with school	β	sr^2
1. Behaviour	.58	.17*	.01
2. Abilities	.54	.21**	.02
3. Appearance	.40	−.01	.00
4. Popularity	.39	−.02	.00
5. Safety	.51	.19*	.02
6. Travel	.41	.09	.00
7. Teachers	.57	.27***	.04
8. Classmates	.41	−.07	.00
9. Friends	.41	.14	.01
Unique variance = .10	$R^2 = .52$		
Shared variance = .39	Adj. $R^2 = .49$		

* $p < .05$; ** $p < .01$; *** $p < .001$

.41 and .58 with school satisfaction. Results of the standard multiple regression analysis is presented in Table 4.

The R for this regression is significantly different from zero, $F(9, 195) = 23.152$, $p < .001$. Altogether, 49% of the variability in satisfaction with school was predicted. Only

four of the nine domains contribute significant unique variance. These are satisfaction with your *teachers* at school, satisfaction with your *abilities* at school, satisfaction with your *safety* at school and satisfaction with your *behavior* at school.

In summary, it has been determined that School satisfaction meets the criteria for a new domain for the PWI-SC and should be considered for inclusion in a future revision of the scale. Further, results suggest a brief, four-item scale as a measure of School satisfaction that explains over half the variance in this construct.

5 Discussion

These are the first published data on SWB for Australian adolescents and it is interesting to note that their sample mean at 74.7% points falls just within the Australian adult normative range of 73.5–76.6. This finding supports SWB Homeostasis Theory which contends that in normal populations, SWB is actively controlled and maintained within a narrow 'set-point' range of values which approximates three quarters of a scale maximum score (e.g., Cummins 1995; Cummins and Nistico 2002).

However, the results also reveal some differences between the adult and adolescent data. Curiously, the domain Achieving in life was below the adult range. Low satisfaction with this domain seems counter-intuitive if one assumes that the school curriculum is actually meeting their developmental needs. In contrast, satisfaction with community connectiveness was above the adult range. However, it is possible that the wording of this item in the PWI-SC may explain this result. Participants were asked 'How satisfied are you about doing things away from your home?' 'Away from home' may imply any social activity, such as going to the movies or to a party with friends, thus, pleasant memories associated with these experiences may be contributing to the higher than expected mean satisfaction ratings for this domain.

In terms of the psychometric properties of the PWI-SC, the scale factored as intended. However, further differences are evident between the adolescent and adult data. With adults, satisfaction with relationships consistently ranks in the top few domains in terms of its unique contribution to LS (e.g., International Wellbeing Group 2006). For adolescents, however, relationships did not provide significant unique variance. This is a curious result given that adolescents, like adults, require supportive relationships. This result is also inconsistent with data from Spain. According to Casas et al. (2009b), using a sample of 1952 high-school students aged 13–16, all 7 domains comprising the PWI-SC contributed unique significant variance when regressed against LS. It is possible that the non-significant results obtained reflect inadequate statistical power due to small sample size.

A further major difference from adult results concerns the domain of safety which, for the adolescents, contributed 2% unique variance. In adults this domain fails to make a unique contribution in Australia and is only retained because it does so in other countries (International Wellbeing Group 2006). These results indicate that the relative contributions of these domains to life as a whole are not equivalent for adults and adolescents.

An implication of these results is that, while they support for the PWI-SC as a valid and reliable tool for assessing SWB in Australian adolescents, the domains contribute differently from the way they do in adults.

5.1 Gender, Age and SWB

SWB amongst females (76.09) was found to be significantly greater than that for males (71.09). This supports adult data from The Australian Unity Wellbeing Index where, averaged over all surveys, females score significantly higher than males.

Perhaps the most concerning finding is a considerable decline in SWB from early to middle adolescence, with the SWB of 16 year olds significantly lower than the younger students. This finding is consistent with those of Casas et al. (2009a) who reports the same trend in SWB from early to mid adolescence in Spain. These findings combine to show cross-cultural evidence for an age-related decline in SWB amongst high-school students. It is possible that the routine measurement of SWB in schools would assist in the identification of 'at-risk' students, thereby enabling the timely provision of support and services.

5.2 School Satisfaction as a Unique Construct

The inclusion of 'School Satisfaction' contributed unique variance in global life satisfaction above that contributed by the existing seven domains on the PWI-SC. It explained an additional 1% unique variance thereby qualifying to be considered as an additional domain for the scale. Additionally, it was shown that a brief four-item scale could be constructed to measure the deconstruction of School Satisfaction, constructed along the same lines as the PWI. The items 'teachers', 'behaviour', 'abilities' and 'safety' explained 52% of the variance in School satisfaction.

In terms of satisfaction with behaviour at school, a review of the literature revealed little work has examined the direct effect of this domain on school satisfaction. However, an intuitive explanation for this connection is that students gain a sense of personal control over aspects of their school life when they behave in certain ways. For example, when students engage with peers, teachers and principals in a meaningful and positive way, they are likely to elicit positive feedback in return. Ongoing constructive interactions of this kind tend to reinforce further positive behaviours and as a consequence, a happy, productive school environment is likely to ensue. Thus, satisfaction with behaviour would be related to the overall school experience and this construct offers exciting directions for further investigation in a future study.

5.3 Study Limitations

A major limitation of the present investigation is that the sample is not representative of the Australian high-school student population. Although an attempt was made to collect equal numbers of male and female respondents representing state government, private, catholic and country schools, the sample was a convenience sample. Thus, the results cannot be interpreted as 'normative'.

6 Summary and Conclusions

Using a convenience sample of Australian high-school students, it was determined that the mean score for SWB was within the Australian adult normative range. The fact that female SWB was higher than male is also consistent with adult findings. Psychometric analyses support the PWI-SC as a valid and reliable tool for assessing SWB in an Australian adolescent sample even though some differences between adolescent and adult data were

observed. These analyses also suggest that a new domain of 'school satisfaction' should be included in a future revision of the PWI-SC. Finally, the finding that 16 year olds have the lowest levels of SWB supports data from Spain. A major implication is that parents, teachers and the wider community need to be aware of the unique and changing needs of adolescents so that support can be offered to people who require it most.

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