

Unit: HPS716 - Research Project

Empirical Report

Topic: **Experiential influences on Subjective-Wellbeing: The role of Loneliness, Transport Accessibility and Geographic Location.**

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“I, the undersigned, declare that this Empirical Report is less than the specified word limit and that it comprises original work and writing by me, and that due acknowledgement has been made to all other material used.

Signed_____ Dated_____”

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Without the following people, I would not have been able to complete this year.

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Abstract

The purpose of this study was to further understand the role of loneliness, transport accessibility and geographic location as experiential influences on subjective well-being. The homeostatic model of subjective well-being was used as a theoretical framework, with general life satisfaction as the measure of subjective well-being. Two hypotheses were tested. First, the influence of remoteness of geographic location when an individual experiences loneliness and a lack of daily access to transport have a negative effect on subjective well-being. Further, these negative experiences combine with general experiential, personality and cognitive buffer factors proposed in the homeostatic model to predict subjective well-being level. Second, these negative experiences combine with an individual's satisfaction levels in salient domains that predict personal, neighbourhood and national well-being, and together will add to the prediction of general life satisfaction. A sample of 195 Australian adults completed a 112-item survey with eleven point end-defined scale items, and demographic questions including geographic location information. The predictors of life satisfaction for each hypothesis were tested using hierarchical regressions and examining the unique and shared contribution of each variable. The results provided partial support for the first hypothesis, and full support for the second hypothesis. Geographic Location was not a significant predictor of Life Satisfaction, whilst Loneliness and Daily transport access experience together with homeostatic model factors were significant predictors of Life Satisfaction. Satisfaction level in some domains of personal and neighbourhood well-being made a unique contribution to the prediction of subjective wellbeing and mediated an individual's experience of loneliness. It was concluded that experiential factors, such as loneliness, lack of transport access, and general life events, combine with homeostatic model factors in contributing to life satisfaction. Positive life experiences and an optimistic outlook on life can reduce the negative experience of specific experiences such as perceived lack of transport access and feelings of loneliness. The role of geographic location as an environmental influence on subjective well-being remains unclear.

An individual's subjective sense of well-being may be determined by many factors including loneliness, access to transport and the geographic location of where the individual lives (Cummins et al., 2005; Kraus et al., 1993; Murray et al., 2004; Vezina & Pelletier, 1997). These experiential factors have been associated with changes in subjective well-being; however their collective influence is yet to be established. Apart from experiential factors, personality factors have been shown to affect how an individual approaches environmental challenges (Headey & Wearing, 1989). Other cognitive buffer factors (self-esteem, optimism, perceived control) have also been found to regulate how individuals respond to environmental challenges. These experiential, personality and cognitive factors have been integrated as determinants of subjective well-being in the homeostatic model of well-being proposed by Cummins and his colleagues (Cummins, Gullone & Lau, 2002). The homeostatic model provides a theoretical framework in which further empirical studies of one determinant, such as specific experiential inputs, can expand our understanding of the way in which that particular determinant is coordinated with the personality and cognitive factors to maintain an individual's sense of well-being at a normal level.

Homeostatic Model of Subjective Well-being (SWB)

The homeostatic model of subjective well-being proposes that SWB is under homeostatic control, whereby personality and cognitive factors combine to meet the challenges of life in order to maintain a high and stable set-point of subjective well-being. Consistent evidence supporting this model demonstrated that the average level of Life Satisfaction is $75 \pm 2.5\% SM$. This is within a normative range of 70 – 80% across many studies of adults from Western cultures (Cummins, Gullone & Lau, 2002). The model is illustrated in Figure 1. The model proposed the interaction of three kinds of determinants in the prediction of subjective well-being: experiential input (positive or negative life experiences); personality factors (extraversion and neuroticism); and cognitive buffer factors (perceived control, self-esteem, and optimism).

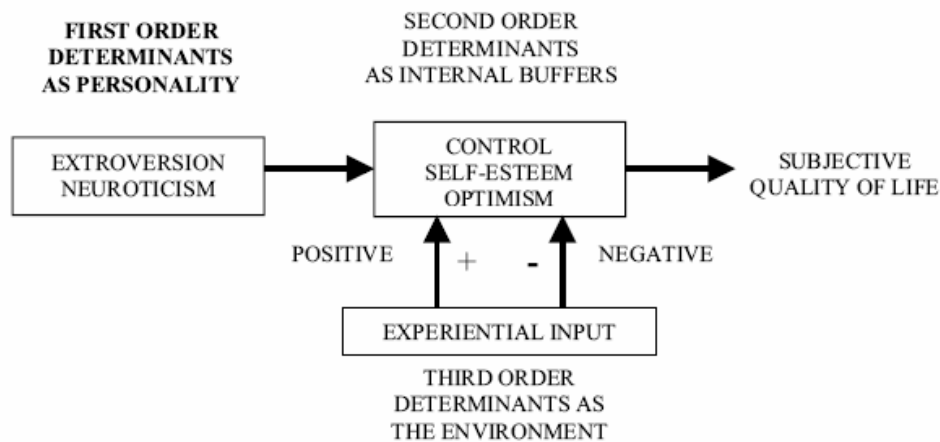


Figure 1. A model of subjective quality of life homeostasis (from Mellor, Cummins, Karlinski & Storer, 2003).

Experiential input

There are a myriad of positive and negative experiences that could influence how satisfied an individual is with their life in general. One previous empirical test of the homeostatic model (Davey, 2004) used a life event measure in which participants were asked if anything recently caused a change in their level of happiness or sadness. Davey (2004) found that the homeostatic model mediated experiences of negative life events. Other important experiences that have been claimed to effect well-being are the places individuals live (geographic location), daily access to transport, and feelings of loneliness.

Geographic Location. Research studies of geographic location and well-being demonstrate inconsistent findings. Reports have indicated that relative to urban living, rural living is advantageous (Cummins et al., 2001, 2005; Oppong et al., 1988), disadvantageous (Fischer, 1973; Haavio-Mannila, 1971), or makes little difference (Best, Cummins & Lo, 2000) to predicting subjective well-being. To define 'rural' has proved an elusive goal (Humphreys, 1998), but a number of frameworks have been developed (Cloke, 1977; Faulkner & French, 1983; Leduc, 1997). The Accessibility/Remoteness Index of Australia (ARIA) [Commonwealth Department of Health and Aged Care, 2001]

is one such framework adopted by Australian researchers (Cummins et al., 2001, 2005; McManus & Pritchard, 2000; Watson, McDonald & Pearce, 2005). The ARIA classifies individuals into one of five categories based on road distances from town centers and accessibility of services. In a study of 7615 Australian participants, Murray et al. (2004) demonstrated a significant association between accessibility to services and quality of life, such that individuals residing in areas with better access to services and opportunities for interaction reported higher levels of well-being.

Subjective well-being is based on how individuals feel about and reflect on their lives, rather than objective measures such as income level. Thus, with respect to the effect of remoteness of geographic locations, it is very likely that the important predictor of subjective well-being is how remoteness from access to services is experienced by the individual, rather than the objective measure of remoteness. Individual differences in circumstances and responses to negative challenges may account for the inconsistencies found for the relationship of objective geographic location and subjective well-being in the studies cited.

Transport Accessibility. The association between transport access and subjective well-being has been well documented (Joseph & Fuller, 1991; Venzina & Pelletier, 1997; Dijst, de Jong & Ritsema van Eck, 2002). Cvitkovich and Wister (2001) found that individuals were able to sustain positive well-being as long as transportation was easily accessible and their transport needs were fulfilled. Transportation access was a significant predictor of well-being scores (contributing 2 % unique variance), and in combination with other experiential inputs such as family support and health, accounted for 29% of the variance in subjective well-being. Satisfaction with daily transport access has not been empirically related to objective geographic location. It has however, been linked with low satisfaction of social relationships. Park (2004) reported that negative interactions or no interactions at all, were associated with a reduced sense of subjective well-being.

Loneliness. Loneliness is a concept that is often seen as the subjective counterpart to the objective measure of social isolation or as the antithesis to social support (Andersson, 1998). Loneliness is defined as the subjective expression of dissatisfaction with a low

number of contacts, whilst social isolation is an objective measure of social interaction (Victor et al., 2000). Social isolation is linked to the subjective concept of loneliness, whereby, loneliness is thought of as negatively perceived social isolation (Victor, 1994; Halmos, 1992). Consistent with the focus on subjective experiences being generally more predictive of subjective well-being than objective measures (Cummins, 2000); loneliness was included as an experiential variable in the current study in preference to the more objective measure of social isolation.

Transport accessibility and geographic location may underlie the experience of loneliness for some individuals. Individuals without adequate access to daily transport and living remotely from services may on an objective measure be social isolated. For those with adequate car access, remote geographic location and poor transport access may not be salient negative factors associated with feeling lonely. In contrast other individuals without alternative transport options may respond by experiencing increased levels of loneliness (Wenger et al., 1996). In summary, the experience of living remotely, transport access, and loneliness appear to be associated and have been shown to separately predict subjective well-being. By embedding the present study in the theoretical framework of the homeostatic model, the individual contributions of these three experiential variables to subjective well-being can be tested more systematically, together with the personality and cognitive determinants of the model.

Personality Factors

An individual's personality characteristics have been found to account for a moderate amount of variance in subjective well-being. Headey and Wearing (1989) demonstrated that very stable personality traits predispose people to experience stable levels of subjective well-being. The personality dimensions of extraversion and neuroticism may affect an individual's resilience to experiential determinants, resulting in differences in subjective well-being (Abbey & Andrews, 1985; Diener, 1984; Headey, Holmstrom & Wearing; 1984). However, a recent empirical test of the prediction of subjective well-being by the homeostatic model predictors with experiential, personality and cognitive factors as predictors of life satisfaction, found that extraversion and neuroticism were not

significant predictors, but rather, self-esteem was the main predictor of subjective well-being (Davey, 2004).

Cognitive Buffer Factors

Perceived control, self-esteem and optimism may be critical factors in determining how an individual responds to the experience of limited access to transport and feelings of social isolation from family, friends, neighbors and community activities. Control has been defined as the individual's perceived ability to change a situation and overcome challenges to achieve a desired outcome (Lachman & Weaver, 1998; Lang & Heckhausen, 2001). If the individual uses effective strategies to redress negative environmental influences the individual may maintain a positive sense of well-being. Similarly an individual's positive perceptions of self and positive outlook on life (self-esteem and optimism) are also assumed to play an important role in buffering against external challenges and sustaining an individual's well-being within a normative range (Roy, Neale & Kendler, 1995; Mäkikangas & Kinnunen, 2003).

Subjective Well-being Domains

The homeostatic model of subjective well-being has recently been extended by the identification of separate personal and national dimensions (Cummins et al., 2003) and a neighbourhood dimension (Cummins & Chambers, 2004), each with a set of salient domains that predict a significant amount of variance in satisfaction level on the specific dimension. For example, satisfaction with one's personal relationships is a salient domain of personal well-being and a significant predictor of general life satisfaction (4% unique variance). Also, satisfaction with the level of trust in one's neighbourhood is highly related to general neighbourhood satisfaction (6% unique variance). Seven domains have been identified as predictors of personal well-being: satisfaction with standard of living, health, life achievements, safety, relationships, community connectedness, and future security (Cummins et al., 2003). The six domains that have been identified as salient for neighbourhood wellbeing are satisfaction with level of trust, social participation, common goals and values, amount of sharing and borrowing, availability of public resources, and

natural environment in the neighbourhood (Chambers, Hollway, Parsons & Wallage, 2003).

Cohen et al. (2003) found that people who consider themselves to be connected and close to their neighbourhood report high levels of well-being. There has been no previous study which considers how geographic location, transport access and loneliness relate to salient domains of personal, neighbourhood and national well-being. Intuitively, poor access to daily transport and public services and loneliness might relate to low satisfaction with one's living standards, community participation and personal relationships on the personal well-being dimension. Salt (2002) found that rural respondents scored higher than their urban counterparts on social capital, which captures elements of trust and reciprocity that exist in relationships between people. Satisfaction with the availability of public resources could relate to satisfaction with access to daily transport and services. The latter could vary with geographic location. Individuals' experience of geographic location, transport access and loneliness are expected to be unrelated to individuals' satisfaction in the national well-being domains (economic, natural environment, social conditions, government, business, national security in Australia). The determination of the relationship between specific experiences to salient well-being domains would provide a more elaborate understanding of how particular negative experiences affect different aspects of subjective well-being

Aim

The aim of study was to further understand the role of geographic location, transport accessibility and loneliness as experiential influences on subjective well-being, using the homeostatic model of well-being as a theoretical framework. In light of the above findings, it was predicted that greater understanding of the relationship of geographic location to subjective well-being would come from a systematic test of related negative experiences (poor transport access and feelings of loneliness) within a theoretical framework that takes account of individual differences in personality and cognitive buffer factors, and salient domains of personal, neighbourhood and national well-being. Two hypotheses were tested.

Hypotheses

Hypothesis 1. An individual's sense of loneliness, access to transport and geographic location predict subjective well-being. These experiential factors will add to the variance accounted for by the homeostatic model predictors of subjective well-being. This hypothesis was tested by a regression analysis of these factors on life satisfaction.

Hypothesis 2. Salient domains of an individual's personal well-being, neighbourhood well-being and national well-being will add to the prediction of life satisfaction from the experiential factors. This hypothesis was tested in a regression analysis the effect of the addition of salient domains of personal, neighbourhood and national well-being, on the relationship between each experiential variable and general satisfaction levels in the three subjective well-being dimensions.

The predicted relationships are shown in Figure 2.

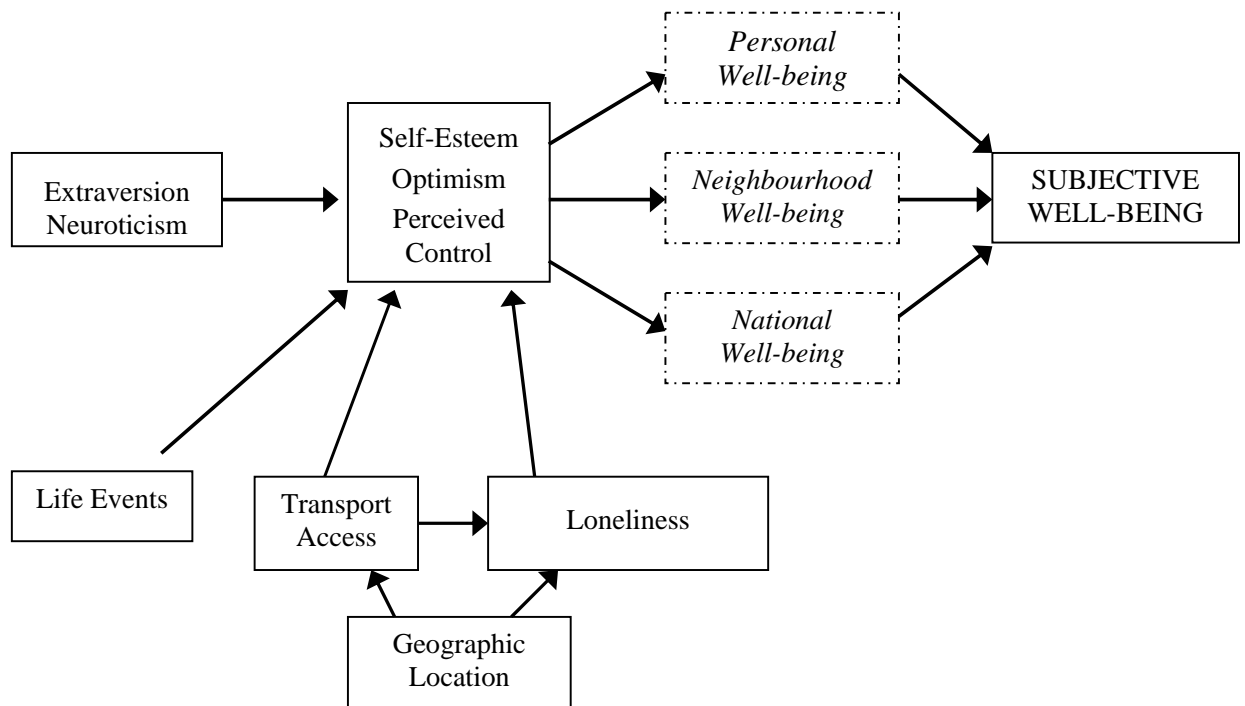


Figure 2. Model of the Relationships between Experiential input, Personality, Perceived control and Subjective well-being.

Method

Participants

The sample consisted of 195 Australians, aged from 24 to 88 years. The mean age was 59 years of age ($SD = 14.20$). There were 77 males (39.5%) and 90 females (45.5 %) in the sample, with gender information not available for 28 respondents. The respondents were a representative sample of adult Australians from the Australian Unity Well-being longitudinal study who had indicated their willingness to complete future surveys. Of the 340 surveys distributed, 195 were returned, resulting in a response rate of 57.4%. Participation was voluntary. A summary of the sample characteristics are provided in Appendix A1.

Measures

Participants completed a 112 item survey which comprised measures of loneliness, transport access, geographic location and variables in the homeostatic model of subjective well-being. Each scale used an 11-point end-defined scale, which has been shown to have increased scale sensitivity in comparison with five or seven point Likert scales (Cummins & Gullone, 2000; Cummins, 2003). Participants also completed demographic questions (Appendix A2).

Loneliness was measured using the UCLA Loneliness Scale (Version 3) [Russell, 1996] to assess subjective feelings of loneliness and social isolation. There were originally twenty items (Q79-98) in this scale, with nine items reverse coded. Inspection of the scale revealed a duplicate question (Q94) in the survey, so data from the second instance item were deleted, giving a total of nineteen items. An item example is: "How often do you feel close to people?" Items were responded to on a scale ranging from "Never" (0) to "Always" (10). Russell (1996) reported coefficient alphas ranging from .89 to .94 for this scale across student, nurses, teachers and elderly samples. A Cronbach's alpha of .94 was obtained in this sample.

Transport Accessibility was measured by the question “How satisfied are you with your access to transport on a daily basis?” (Q99). Respondents indicated their satisfaction on an 11 point end-defined scale ranging from “Very Dissatisfied” (0) to “Very Satisfied” (10).

Geographic Location was measured using the Accessibility/Remoteness Index for Australia [Commonwealth Department of Aged Care at Adelaide University (2001)]. ARIA is an index of accessibility and remoteness of places based on postcode location. Localities are given a score (from 0 to 12) based on the distance to service towns of different sizes. Three index groups existed in the current study, with scores classified into the following categories:

1. Highly Accessible (ARIA score 0–1.84)—relatively unrestricted accessibility to a wide range of goods and services and opportunities for social interaction.
2. Accessible (ARIA score >1.84–3.51)—some restrictions to accessibility of some goods, services and opportunities for social interaction.
3. Moderately Accessible (ARIA score >3.51–5.80)—significantly restricted accessibility of goods, services and opportunities for social interaction.

Subjective Well-Being

Life Satisfaction was measured by the single question “How satisfied are you with your life as a whole?” (Andrews & Withey, 1976).

Personal Well-being (PWB) was measured using The Personal Well-being Scale (International Wellbeing Group, 2005). The scale consisted of seven items (Q2-9) measuring satisfaction with domains such as standard of living, health, achievements, personal relationships, safety, community connectedness, and future security. The Cronbach’s alpha for this scale generally falls between .70 and .85 (International Wellbeing Group, 2005). The coefficient in this study was .86.

Neighbourhood Well-being (NWB) was measured using The Neighbourhood Well-being Scale (Hollaway, 2003) comprised of six items (Q10-16), each measuring a broad domain: trust, social participation, state of natural environment, common goals and

values, availability of public resources, and sharing and borrowing. Hollaway (2003) reported a Cronbach's alpha of .89 for this scale. The current study obtained an alpha of .90.

National Well-being was measured with six items on the National Well-being Index developed by (Cummins et al., 2003), who demonstrated construct reliability by factor analysis with separate factors for personal and national well-being. A reliability of .91 was found for the scale in the current study.

Homeostatic Model Predictors

Personality was measured using the Ten Item Personality Inventory (Gosling, Rentfrow and Swann, 2003) which is designed to measure the Big Five personality dimensions. Four items (Q75-78) measured extraversion and emotional stability. One item from each scale is reverse coded for analysis. Gosling, Rentfrow, and Swann (2003) reported Cronbach's alpha's of .68 for extraversion and .73 for emotional stability. The corresponding reliability coefficients for the present study were .69 and .60.

Cognitive Buffers The three cognitive buffer factors of perceived control, self-esteem and optimism were measured on separate scales with on an 11 point end-defined scale ranging from 'Strongly Disagree' (0) to 'Strongly Agree' (10).

Perceived control was measured by the Perceived Control scale (Chambers et al., 2003) consisting of nine items (Q53-61). There are three items to measure each type of control; primary, secondary and relinquished control. The relinquished control items were reverse coded for analysis. Chambers, Cummins, Mellor, Firth and Stokes (2005) reported a coefficient alpha of .76 for the scale. A Cronbach's alpha of .62 was obtained in this sample.

Self-esteem was measured using the Rosenberg Self-Esteem Scale (Rosenberg, 1979) of ten items (Q62-71). Five of the items were reverse coded for analysis. Previous studies based on five-point scales found reliabilities that ranged from .72 to .90 for adult samples (Gary-Little, Williams & Hancock, 1997; Robins, Henden & Trzesniewski, 2001). Adapting the items to an 11- point scale, the alpha coefficient was .87 for this sample.

Optimism was measured using the Life Orientation Test-Revised (Carver & Scheier, 2003) which consisted of six items. The questions were framed either in an optimistic or pessimistic fashion. This survey only used the three optimistically framed questions (Q72-74) with previous reliability ranging from .75 to .85 using a 5-point Likert scale. In this study, a Cronbach's alpha of .87 was obtained using an 11 point end-defined scale.

Experiential input Life event (*LE*) was measured by the item: "Has anything happened to you recently causing you to feel happier or sadder than normal?". Respondents indicated "Yes, happier", or "Yes, sadder" or "No". Responses on this question were used to create a Life Events scale, with Happier = 3, No = 2, and Sadder = 1.

Procedure

Although the current study was part of a larger study, separate ethics approval was obtained from the Deakin University Ethics Committee. Following this approval, the questionnaires were posted to participants in a package including a plain language statement, a letter to the participant and a reply-paid envelope (see Appendix A3). Questionnaires were designed to take approximately 20 minutes to complete and were to be returned via the postage paid envelope to Deakin University.

Results

Preliminary Analyses

Prior to hypothesis testing, various issues were examined to determine the appropriateness of the data set for statistical analyses. Summaries of these analyses are provided in Appendix B1.

Accuracy and completeness of the data set

Each item on the survey was examined for missing data and extreme values. SPSS 12.0.1 MISSING VALUES ANALYSIS found less than 5 per cent of data to be missing, with no discernible pattern. Given the small number, a pairwise missing values approach was used in all SPSS analyses. The data set was considered to consist of valid responses as all data values were within range for the relevant scales.

Normality of distributions and outliers

Each question on the scale was examined for outliers. A number of outliers were found, however because the items were scaled on an 11-point end-defined scale, the outliers were not very different from the rest of the data distribution, so outliers were not deleted. Using the Kolmogorov-Smirnov statistic, normality was violated for almost all variables. Distributions were inspected for all variables except the life satisfaction variables (e.g. life-as-a-whole and domain scores) which are typically negatively skewed, as the average rating for Life Satisfaction is 75 ± 2.5 SM% (Campbell, Converse & Rodgers, 1976; Cummins, 1995; 1997) irrespective of the scale used or the characteristics of the respondents. Distributions of the measures for neuroticism and loneliness were positively skewed; extraversion and life events were mildly negatively skewed; and perceived control, self-esteem, optimism and transport were strongly negatively skewed. The sample size criteria for regression analyses were satisfied. Descriptive analyses are provided in Appendix B2.

Hypotheses Testing

The hypotheses were tested using hierarchical multiple regressions.

Hypothesis One: Geographic Location, Loneliness and Transport Access as predictors of Life Satisfaction and in combination with the components of the homeostatic model of well-being.

Inspection of the frequencies of participants living in remote locations revealed that only 21 participants lived in accessible locations and 7 lived in moderately accessible locations, whereas 132 of the participants lived in highly accessible locations. It was useful to combine those living in moderate and accessible locations into one group, yielding two geographic location groups based on remoteness from services. An initial standard regression analysis was conducted with Life Satisfaction as the dependent measure of subjective well-being and Remoteness, Loneliness and Transport Access as the independent variables. The results are presented in Table 1.

Table 1

Regression Analyses for Remoteness, Loneliness, Transport Access and the Homeostatic Model Factors of Subjective Well-being on Life Satisfaction

Variable	<i>M</i>	<i>SD</i>	<i>N</i>	<i>r</i>	β	sr^2	R^2
<u>Model 1</u>							.30***
Remoteness	1.18	0.38	160	.04	.08		
Loneliness	34.17	18.36	183	-.52***	-.49***	.23	
Transport Access	71.69	27.88	195	.26***	.16*	.03	
Life Satisfaction (DV)	77.85	16.91	195		.08		

Note. Unique variability = .24; shared variability = .04. *** $p < .001$. * $p < .05$

It can be seen that Life satisfaction was significantly predicted by the three experiential variables, $F(3, 147) = 21.30, p < .001$. Both Loneliness ($sr^2 = .23$) and Transport Access ($sr^2 = .03$) contributed unique variance to the prediction of Life Satisfaction, with Loneliness being negatively related, and high satisfaction with Transport Access being positively related, as expected. However, Remoteness was unrelated ($r = .04, p > .05$) to Life Satisfaction. For this reason this variable was dropped from subsequent analyses, given that a correlation above .3 is considered the preferred minimum correlation with the dependent variable for independent variables in a regression analysis (Pallant, 2005). The next analysis tested if the Loneliness and Transport Access variables had an additive contribution to the prediction of Life Satisfaction above the variance accounted for by the Homeostatic model factors. A hierarchical regression was conducted with the homeostatic model factors entered in Model 1, and Loneliness and Transport Access added in Model 2. The results are shown in Table 2.

Table 2

Regression Analyses for Homeostatic Model Factors, Loneliness, Transport Access on Life Satisfaction

Variable	<i>M</i>	<i>SD</i>	<i>N</i>	<i>r</i>	β	sr^2	R^2	ΔR^2
<u>Model 1</u>								
Life Event					.15*	.02	.33***	
Extraversion					.07			
Neuroticism					.09			
Self-esteem					.28**	.04		

Optimism					.28**	.04		
Perceived Control					.09			
<u>Model 2</u>								
Life Event	2.07	0.73	190	.24***	.14*	.02	.39	.06**
Extraversion	53.42	24.65	190	.25***	.03			
Neuroticism	29.53	19.83	193	-.28***	.13			
Self-esteem	75.65	16.79	192	.46***	.14			
Optimism	68.90	18.58	188	.49***	.24**	.03		
Perceived Control	67.61	10.96	194	.37***	.06			
Loneliness	34.17	18.36	195	-.52***	-.27**	.03		
Transport Access	71.69	27.88	183	.26***	.14*	.02		
(Life Satisfaction: DV)	77.85	16.91	195					

Note. Model 1: Unique variability = .10; shared variability = .23; Model 2: Unique variability = .10; shared variability = .29; *** $p < .001$. ** $p < .01$. * $p < .05$.

Model 1 demonstrated that the homeostatic model factors accounted for 33% of the variance in Life Satisfaction, $F(6, 173) = 14.48, p < .001$, with Life Event ($\beta = .15$), Self-esteem ($\beta = .28$) and Optimism ($\beta = .28$) being the strongest predictors, accounting for a significant 10% unique variability ($sr^2 = .02; .04$ and $.04$, respectively). The remaining variables shared 23% of the variance with these factors, but no significant unique variance (Extraversion, Neuroticism and Perceived Control). The addition of the Loneliness and Transport access variable in Model 2 added significant prediction to the variance in Life Satisfaction (R^2 change = $.06$), $F(8, 171) = 13.63, p < .001$. It is of interest to note that both variables added significant unique variance (3% Loneliness; 2% Transport Access). Of the homeostatic model factors, Life Events continued to predict a significant 2% unique variance, optimism predicted a significant 3% (a reduction of 1%), and self-esteem no longer predicted significant unique variance. In comparison with Table 1 where Loneliness accounted for 23% of the variance in Life Satisfaction, with the homeostatic factors added, Loneliness accounted for just 3% unique variance. Inspection of the correlations of Loneliness and Transport Access with the homeostatic model factors indicated that Loneliness was highly correlated with all factors with the exception of Life Event (see Table 3), whereas the correlations with Transport Access and the homeostatic model factors was weak.

Table 3

Correlations of New Experiential Factors with Homeostatic Model Factors

Variable		Life Event	Extraversion	Neuroticism	Self-esteem	Optimism	Perceived Control
Loneliness	<i>r</i>	-0.19*	-0.41**	0.49**	-0.68**	-0.51**	-0.47**
	<i>N</i>	180	182	181	180	183	183
Transport Access	<i>r</i>	0.00	-0.06	-0.22**	0.23**	0.24**	0.18*
	<i>N</i>	190	193	192	188	194	195

** $p < .01$. * $p < .05$ (two-tailed)

These findings provide support for Hypothesis 1 with the exception that Remoteness was not a significant factor in the prediction of Life Satisfaction. Loneliness and Transport Access were significant predictors, and had an additive contribution to the homeostatic factors in the prediction of Life Satisfaction.

Hypothesis Two: Salient domains of personal well-being, neighbourhood well-being and national well-being will add to the prediction of life satisfaction from the experiential factors.

The next analysis explored how domains identified as salient to personal, neighbourhood and national well-being affect the relationship between two experiential factors (loneliness and transport access) and subjective well-being. The domains of the personal, neighbourhood and national well-being indexes were the measures of salient domains used in the analyses, with satisfaction level measured by a general question measuring Life Satisfaction, Neighbourhood Satisfaction and National Satisfaction, as the dependent variables.

Two sets of hierarchical regressions were conducted; one with loneliness as the experiential variable, the other with transport access as the experiential variable. In Model 1 of each analysis, the experiential variable was entered. In Model 2, the set of variables from one of the well-being indexes was entered, together with the experiential variable. This approach allowed measurement of the effect of the domain variables on the experiential variable in the prediction of a specific dimension of well-being and are presented in Table 4 and Table 5.

Table 4

Regression Analyses for Loneliness (Model 1) plus Personal, Neighbourhood and National Well-being Domains (Model 2) on Life, Neighbourhood and National Satisfaction

Model	Variable	Dependent Variable					
		<u>Life</u>		<u>Neighbourhood</u>		<u>National</u>	
		β	sr ²	β	sr ²	β	sr ²
1	Loneliness	-.52***	.27	-.40***	.16	-.30***	.09
	R	.52***		.40***		.30***	
	R ²	.27		.16		.09	
2	<u>Personal Index</u>						
	Standard of Living	.26***	.04	.09		.28***	.05
	Health	.20***	.02	.09		-.00	
	Achievement	.26***	.03	-.13		.02	
	Relationships	.31***	.06	.08		.11	
	Feel Safe	.02		.16*	.02	.07	
	Part of Community	.07		.43***	.07	.04	
	Future Security	-.08		.06		.13	
	(Loneliness)	-.04		-.05		-.03	
	R	.83***		.67***		.53***	
	R ²	.70		.44		.28	
	ΔR^2	.42***		.29***		.19***	
	Unique variability	15%		9%		5%	
	Shared variability	55%		35%		23%	
2	<u>Neighbourhood Index</u>						
	Trust	-.04		.15*	.01	.17	
	Social Participation	.09		.04		-.06	
	Common Goals	-.01		-.01		.22*	.02
	Natural Environment	-.03		.01		.12	
	Public Resources	.11		.04		.05	
	Sharing	.21*	.02	.66***	.20	.15	
	(Loneliness)	-.42***	.13	-.10*	.01	-.09	
	R	.59***		.86***		.55***	
	R ²	.35		.74		.31	
	ΔR^2	.08**		.59***		.22***	
	Unique variability	15%		22%		2%	
	Shared variability	20%		52%		29%	
2	<u>National Index</u>						
	Economic Situation	.11		.26**	.03	.38***	.08
	Natural Environment	.06		.14		.14	
	Social Conditions	-.03		-.11		.28**	.03
	Government	-.04		-.04		.14	
	Business	.13		.01		-.26*	.02
	National Security	.09		.10		-.02	
	(Loneliness)	-.45***	.18	-.33***	.09	-.22***	.05
	R	.59***		.51***		.68***	
	R ²	.34		.26		.46	
	ΔR^2	.07**		.11***		.37***	
	Unique variability	18%		12%		18%	

Shared variability	16%	14%	28%
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*** $p < .001$. ** $p < .01$. * $p < .05$.

In the case of Loneliness, Table 4 reveals that Loneliness was a significant predictor of Life satisfaction, Neighbourhood satisfaction and National satisfaction (27%, 16% and 9% of variance, respectively). With the entry of the personal well-being domains in Model 2, loneliness was not a significant predictor of any of the satisfaction dependent variables. The initial effect appeared to be mediated by Standard of living, health, achievement, and relationships in the prediction of Life Satisfaction; Feeling safe and Part of the community in the prediction of Neighbourhood Satisfaction; and Standard of Living in the prediction of National satisfaction. With the entry of the neighbourhood well-being domains loneliness remained a significant unique predictor of Life Satisfaction and Neighbourhood Satisfaction, indicating these domains are less effective in mediating the effect of loneliness. The Sharing domain of the Neighbourhood Index appeared to have a singular mediating influence on loneliness in the case of Neighbourhood Satisfaction (20% variance). The national domains appeared to be least effective in mediating the effect of loneliness on the prediction of Life Satisfaction and Neighbourhood Satisfaction. In general, the three satisfaction measures of well-being were predicted to some extent by Loneliness (9% to 27%), with higher satisfaction levels on some of the personal well-being domains appearing to play the greatest role in mediating the effect of loneliness.

From Table 5 it can be seen that similar, but weaker, pattern of relationships were evident for the relationship of transport access, well-being domains and life, neighbourhood and national satisfaction. These exploratory results provide more elaborate information about the relationship of experiential factors to subjective well-being, and provide support for the second hypothesis.

Table 5

Regression Analyses for Transport Access (Model 1) plus Personal, Neighbourhood and National Well-being Domains (Model 2) on Life, Neighbourhood and National Satisfaction

Model	Variable	Dependent Variable					
		<u>Life</u>		<u>Neighbourhood</u>		<u>National</u>	
		β	sr^2	β	sr^2	β	sr^2
1	Transport Access	.26***	.07	.20***	.04	.22**	.05
	R	.26***		.20***		.22**	
	R ²	.07		.04		.05	
2	<u>Personal Index</u>						
	Standard of Living	.25***	.04	.08		.26***	.07
	Health	.18***	.02	.08		-.02	
	Achievement	.27***	.03	-.11		.03	
	Relationships	.33***	.11	.10		.13	
	Feel Safe	.02		.16*	.03	.07	
	Part of Community	.08		.45***	.20	.05	
	Future Security (Transport Access)	-.08		.05		.12	
	R	.06		.04		.09	
	R ²	.84***		.66***		.53***	
	R ²	.70		.44		.29	
	ΔR^2	.63***		.40***		.24***	
	Unique variability	10%		25%		7%	
	Shared variability	60%		19%		22%	
2	<u>Neighbourhood Index</u>						
	Trust	.10		.18**	.01	.20	
	Social Participation	.16		.06		-.05	
	Common Goals	-.04		-.02		.21*	.02
	Natural Environment	-.03		.01		.11	
	Public Resources	.11		.04		.05	
	Sharing (Transport Access)	.19*	.02	.65***	.43	.14	
	R	.19**	.03	.06		.07	
	R ²	.50***		.86***		.55***	
	R ²	.25		.74		.30	
	ΔR^2	.18***		.70***		.26***	
	Unique variability	5%		44%		2%	
	Shared variability	20%		30%		28%	
2	<u>National Index</u>						
	Economic Situation	.06		.23*	.03	.35***	.06
	Natural Environment	.12		.19		.17	
	Social Conditions	-.07		-.14		.26**	.02
	Government	-.08		-.07		.12	
	Business	.28*	.08	.12		-.19	
	National Security (Transport Access)	.09		.10		-.02	
	R	.19**	.04	.10		.09	
	R ²	.44***		.42***		.65***	
	R ²	.20		.18		.42	
	ΔR^2	.13***		.14***		.38***	
	Unique variability	12%		3%		8%	
	Shared variability	8%		15%		34%	

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

Discussion

The central purpose of this study was to examine further the negative experiences of loneliness, inadequate daily transport access, and living remotely from public services as examples of experiences that affect an individual's well-being, taking into account individual differences in personality types and cognitive buffer factors, according to the subjective quality of life homeostatic model (Cummins, Gullone & Lau, 2002).

The results provided partial support for the first hypothesis. Loneliness and transport access satisfaction significantly predicted subjective well-being, however contrary to this hypothesis; geographic location did not significantly predict subjective well-being. Further, the significance of loneliness and transport access as predictors of well-being was maintained with the addition of the central components of the homeostatic model of subjective well-being. Additionally, the results demonstrated support for the second hypothesis in that salient domains of personal well-being and neighbourhood well-being were specific to the experience of loneliness and transport access. These findings provide important new evidence for the relationship of experiential inputs on well-being.

Experiential input and the Homeostatic Model of Subjective Well-being

Loneliness was the strongest predictor of subjective well-being, and together with transport access, these experiential influences accounted for 28% of the variance in subjective well-being. This is consistent with previous research by Cvitkovich & Wister (2001) and Vezina & Pelletier (1997) who both found that individuals who have satisfactory access to transport report higher levels of satisfaction with their quality of life. This study showed that loneliness and transport accessibility were significantly related; indicating that these experiential influences may occur concomitantly. Indeed, this is in line with previous research documenting that transportation restricts freedom of movement and results in isolation (Woodward, 1988; Kivett, 1991).

The finding that geographic location had no influence upon an individual's overall life satisfaction, support the findings of Best, Cummins and Lo (2000) who reported that there was no overall difference in subjective quality of life between farmers, ex-farmers and metropolitan residents. Two explanations may account for a lack of evidence for the

effect of geographic location on subjective well-being. Firstly, specific to this study, the sample had few participants in some of the geographic location categories, and thus provided a limited measure of this variable. Secondly, on more general grounds, the results indicate the experience of poor access to transport, and loneliness affect subjective well-being, but these factors may be ameliorated by differences in cognitive buffer factors and satisfaction in other life domains. Thus differences in the results across studies may be based on individual differences in the impact of the experiences of living remotely, rather than the objective fact of living in a particular geographic location.

Collectively, the homeostatic factors made a significant contribution to SWB, and provide empirical support for the homeostatic model of subjective well-being. As a theoretical framework the model was successful in pinpointing how two experiential factors interact with internal factors in predicting subjective well-being. In the case of loneliness and transport access, these two factors predicted a substantial amount of variance in subjective well-being (30%) with loneliness contributing 23% unique variance, and little shared variance (4%). This contrasted with the contribution of the homeostatic model factors jointly predicting 33% to the variance of subjective well-being, with life event (2%), self-esteem (4%), and optimism (4%) providing unique variance and 23% shared variance. The large amount of shared variance indicates the homeostatic model factors are working together to maintain subjective well-being. The personality factors and perceived control did not make unique contributions.

The result for the personality factors is not surprising, given that the model proposes that cognitive buffer factors mediate the effect of personality on subjective well-being (Cummins, Gullone & Lau, 2002). However, a supplementary regression analyses omitting the cognitive buffer factors indicated that the personality factors still did not provide unique variance, and that the correlations of both personality factors with life satisfaction were significant but weak (.25, extraversion; -.28, neuroticism) (Appendix D1). Similar weak relationships were reported by Davey (2004) and may be accounted for by the abbreviation of the personality scales used in this study. The finding for perceived control was not expected. Given that there was a strong negative correlation of loneliness and perceived control (-.46) and moderate correlation of perceived control with

life satisfaction (.37), and that the increase in the variance when loneliness was added to the homeostatic model factors was largely shared variance, it seems likely that this result reflects an interaction between loneliness and perceived control. A supplementary analysis (Appendix D2) indicated that when optimism and self-esteem were omitted, perceived control did make a significant unique contribution to the prediction of life satisfaction.

A critical finding for this study was the evidence that the cognitive buffer factors appeared to interact with the new experiential factors, in particular loneliness. With the combined factors as predictors, an additional 6% of the variance in subjective well-being was accounted for; there was a 6% gain in shared variance, a redistribution of the amount of unique variance across the variables with loneliness reducing from -23% to -3% of unique variance, and self-esteem no longer being a significant unique predictor. These results suggest that the homeostatic factors are operating to minimize the negative impact of loneliness on the individual's subjective well-being. The results also suggest that the experience of loneliness has a more critical negative impact on subjective well-being than the more specific negative experience of dissatisfaction with access to daily transport. Thus the model has provided a means for evaluating how different experiences interact with specific homeostatic factors in predicting subjective well-being, and the relative importance of the effect of different experiences on subjective well-being.

The finding that life events and optimism reduced the impact and challenge of the experiences of loneliness and poor transport access on individual's quality of life, supports previous research proposing the importance of an optimistic attitude and the occurrence of positive events enhances well-being (Cummins & Nistico, 2002; Heady, Holmstrom & Wearing, 1984). The finding for self-esteem suggests that when an individual's perceived feelings of loneliness and transport access satisfaction are sufficiently negative, self-esteem is particularly challenged. In this study self-esteem had a high negative correlation with loneliness ($r = -.68$) and a high positive correlation with life satisfaction ($r = .50$). The latter relationship is the finding that is consistent with previous research which asserts that self-esteem has a positive relationship with subjective wellbeing (Judge et al., 2002; Roy, Neale & Kendler, 1995). When the

optimism measure was omitted from a supplementary regression analysis, self-esteem did provide a unique contribution to the prediction of life satisfaction (see Appendix D3). More research is needed to understand the combined operation of the three cognitive buffer factors with different experiential factors.

Experiential input and the prediction of Personal Well-being, Neighbourhood Wellbeing and National Well-being.

The second analysis revealed that loneliness is a significant predictor of life satisfaction, neighbourhood satisfaction and national satisfaction. Transport access was found to be a similar but weaker predictor. These findings help pinpoint the domains that are affected by loneliness and poor transport access.

The current finding extends previous research by ascertaining which domains of the salient dimensions of well-being are responsible for over-riding the feelings an individual has when they are lonely or have inadequate access to daily transport. The finding that personal well-being was by far the greatest contributor to life satisfaction, may be explained by the proximal distal regulation of the homeostatic model (Cummins, 2003), which suggests that as aspects of life move away from person control, there is less personal concern so satisfaction levels decreases. This approach could also be applied to the lack of the contribution of national well-being domains to life satisfaction.

Interestingly, satisfaction in different domains of personal and neighbourhood well-being reduced the impact of loneliness and transport accessibility on life satisfaction. Namely, the standard of living, health, life achievements and relationship domains of personal well-being and the sharing domain of neighbourhood well-being mediated the initial effect of loneliness and transport access upon well-being. Satisfaction in these domains is integrally related to loneliness, particularly satisfaction with health and relationships (Andersson, 1998; Victor et al., 2000).

In summary, Figure 3 figure represents key findings in the present study, showing that life events and optimism impact the experience of loneliness and daily transport access and that there are five domains that mediate the influence of these experiential experiences. Policy makers may be able to redress interventions aimed at reducing the

experience of loneliness within society by focusing on individual's satisfaction within the five domains of life shown. Indeed, while it is important to incorporate transportation into policies, it is also as important for society to be conscious of the pervasive influence of loneliness on subjective well-being and the underlying determinants.

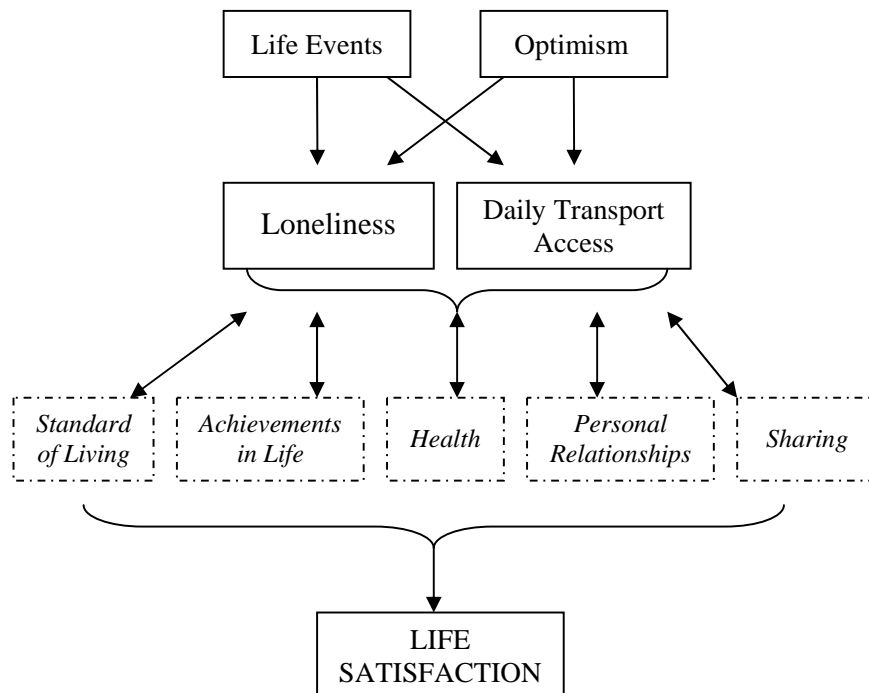


Figure 3. The interactions of factors of the subjective quality of life homeostatic model and experiential input.

Limitations and Future Recommendations

As urban areas continue to grow throughout the world, the quality of the cities and their suburbs and the quality of ambient environment will become more important in defining quality of life. In this study, the sample did not embody all five ARIA classification groups. Therefore, the lack of a geographic location effect in this study may be attributed to participants falling only within the top three ARIA groups (high accessible, accessible and moderately accessible), with most participants falling into the highest group.

Subsequent research is warranted with larger sample sizes and participants representative of all five ARIA classification groups, ranging from highly assessable to very remote, in order to ascertain and quantify whether previous reports outlining the relationship between location and well-being are accurate.

Future Research

In the current study, the measure of life events were taken as any recent event that has happened recently. Future studies may aim to distinguish between positive and negative life events and their effects upon feelings of loneliness and poor satisfaction with transport. Given the relative contributions of self-esteem, optimism and perceived control, optimism was larger predictor of well-being and so studies examining whether an individual who has experienced positive life events versus negative life events and the effects on optimism could establish what life circumstances may threaten the threshold for change and alter an individuals' approach to the challenge of loneliness and transport accessibility.

The current study illustrated that the experience of loneliness lowered subjective well-being. Future research may seek to identify groups within society that have decreased opportunity for social connectedness and cohesion which have positive implications for mental health organizations, enabling them to identify groups within society, other than the elderly, that have greater susceptibility to mental health issues, such as the experience of depression as a consequent of the experiential factors identified in this study.

Conclusion

The current study sought to investigate the influence of geographic location, satisfaction with daily transport and loneliness on subjective quality of life. In general, the study demonstrated that an individual's quality of life was predicted by loneliness and transport accessibility, but not geographic location. Further, an individual's experience of loneliness and poor access to transport impacted on their satisfaction with their personal life, and to a lesser extent their satisfaction with their neighbourhood life. The homeostatic model of subjective well-being provided a useful theoretical framework to understand the impact of loneliness and transport access by demonstrating specific interactions with underlying cognitive buffer factors, and by identifying the domains that are sensitive to these experiences and satisfaction with one's life at the personal, neighbourhood and national level.

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