

# Journal of Rural and Community Development

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**Citation:**

Millward, H. (2013). Satisfaction with life along the rural-urban continuum: Key indicators in the Halifax region of Canada. *Journal of Rural and Community Development*, 8(3), 263-278.



**BRANDON  
UNIVERSITY**  
Founded 1899

**Publisher:**

Rural Development Institute, Brandon University.

**Editor:**

Dr. Doug Ramsey

**Open Access Policy:**

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# **Satisfaction with Life along the Rural-Urban Continuum: Key Indicators in the Halifax Region of Canada**

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## **Abstract**

This paper examines how satisfaction with life (SWL) varies for residents in different zones of the rural-urban continuum, using objective and subjective indicators for 1,971 respondents in the county-sized municipality of Halifax, Nova Scotia, Canada. Data are from the STAR project, which was a combined time diary and travel survey. Respondents rated their overall feelings about life quality (global SWL) and feelings for life domains (e.g. health, finances). SWL scores were highest in the inner city (IC), moderate in the suburbs and inner commuter belt (ICB), and lowest in the outer commuter belt (OCB). These variations are partly related to the geography of socio-demographic 'control' variables, such as age, household income, and marriage status. They also relate strongly to self-rated health status (highest in the IC), and ratings of 'time stress' (lowest in the IC, highest in the commuter belt). Some inherently geographic variables also relate significantly to SWL: the most notable are 'sense of community belonging' (highest in the IC, lowest in the OCB) and 'unsafe walking after dark' (least safe in the IC, safest in the OCB).

Keywords: life satisfaction, well-being, rural-urban, community, health

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## **1.0 Introduction**

This article investigates how perceived quality of life varies across different zones of the rural-urban continuum, for survey respondents in the county-sized municipality of Halifax, Nova Scotia, Canada. Quality of life (QOL) is an important concern for individuals, communities, and society at large. It is often equated with well-being, and is amenable to both objective and subjective appraisal and analysis (Helburn, 1982; Beesley & Russwurm, 1989; Felce, 1997; Prutkin & Feinstein, 2002; Frey & Stutzer, 2005). Objective appraisals of QOL typically focus on levels of provision of basic human needs, such as housing, healthcare, education, community safety, and transportation (Dasgupta & Weale, 1992). Census data on these objective variables are readily available in spatially aggregated form, and can be combined in composite indices using various weighting schemes. Subjective evaluation of QOL/well-being is more difficult and expensive, since it requires a questionnaire survey of individual respondents, regarding their feelings of satisfaction with various aspects ('domains') of their life, and about their life in general (Andrews & McKennell, 1980; Chamberlain, 1988; Pavot & Diener, 1993; Diener, 2000). The 'global' satisfaction-with-life (SWL) question was first devised by Andrews and Withey (1976), and asks "How do you feel about your life as a whole right now?" It is rated on a 10-point Likert scale, and has become the standard question employed in subjective SWL studies.

Global SWL scores typically show moderately strong correlations with scores for the major components or domains of life satisfaction (Cummins, 1993; 1995; 1996; Hsieh, 2003), but the domains are inter-related and thus not simply additive (WHOQOL Group, 1998). The five most frequently used domains, rated by perceived importance to respondents, are health, intimacy, emotional well-being, material well-being, and productivity (Cummins, 1996). These domains may be represented by many individual variables related to the respondent's health (physical and mental), spirituality, safety, social status, availability of resources (emotional, social, and financial), work/school activity, and community/neighbourhood characteristics. These variables in turn are mediated or partly controlled by standard socio-demographic variables like sex, age, education, and income. Although a great many variables show significant relationships to global SWL scores (Dolan et al., 2008), it is notoriously difficult to accurately estimate or predict these scores for individuals: they are highly personal evaluations, dependent on a host of personal characteristics and circumstances, and liable to change from day to day. Many studies therefore focus on mean SWL scores for social, economic, or geographic groups. Whether assessed objectively or subjectively, aggregated global and domain-related quality of life vary geographically, and are amenable to geographic analysis (Brereton et al., 2008). For geographers, the key questions are:

- a) Is the spatial variation random or systematically structured?
- b) At what scale of aggregation is the pattern most clearly non-random?
- c) To what extent does the pattern reflect the operation of underlying socio-economic-demographic 'control' variables (which may themselves be spatially patterned)?
- d) To what extent can the pattern be attributed to the operation of inherently geographic or locational variables, related to environment, livelihood, community, and accessibility?

The geography of life quality has been investigated somewhat intermittently over the last 40 years. Most studies have been empirical in nature and urban in scope, typically employing objective indicators of QOL for city census tracts or similar neighbourhood units. For example, Smith's groundbreaking study of Tampa Bay, Florida, combined variables related to environment, crime, social conditions, public facilities etc. into a single unweighted index for each census tract (Smith, 1973). Mapping of the index showed low well-being in the inner city and the suburbs enjoying much higher well-being. Studies for other cities also report zonal and sectoral patterns (Stimpson, 1982). Li and Weng (2007) extended this approach for Indianapolis, Indiana, by adding remotely-sensed land use and land cover variables, and employing factor analysis to derive a synthetic QOL index at the block-group level. They show a pronounced centre-periphery pattern, with lowest QOL in the inner city. A 25-city study by Jensen and Leven (1997) specifically compared U.S. central cities to suburbs over time, using objective 'key variables' for QOL domains. They showed central cities improving relative to suburbs (though remaining lower) in the 1980-1995 period.

QOL studies in rural districts tend to focus on small localities, using questionnaire surveys to evaluate subjective aspects of life quality (e.g. Garrison, 1998; Richmond et al., 2000; Brereton et al., 2011). Particular attention has been paid to the effects of rural migration and exurbanization processes on community integrity (Beesley &

Bowles, 1991; Auh & Cook, 2009), and access to health services and facilities (Bukenya et al. 2003; Tay et al., 2004).

Several studies have addressed the issue of rural-urban differences in life quality. Comparisons of subjective SWL for metro versus non-metro areas in the United States (Mookherjee, 1992) and Australia (Best et al., 2000) found no significant differences, while Beesley's (1997) comparison of metro and non-metro fringe areas in southern Ontario found only minor differences. Oppong et al. (1988) found that residents of a small town in Alberta (High Prairie) showed more life satisfaction than those residing in either the city of Edmonton or in remote northern communities. Two recent European studies have also compared rural-urban differences, though at coarse spatial scales: Shucksmith et al. (2009) found little evidence of significant rural-urban differences in subjective well-being throughout Europe, while Campanera & Higgins (2011) found that urban-classified English local authority areas register significantly lower objective quality of life than their rural counterparts.

The present study aims to provide a more thorough and nuanced analysis of rural-urban variations in SWL, by employing the notion of a rural-urban continuum (Pahl, 1966), grading from fully urban in the inner city to fully rural in isolated peripheral areas. Ways of life and access to modern amenities and services vary greatly along this continuum, and it is reasonable to expect significant variation in the components and drivers of life satisfaction, and thus in overall life satisfaction. For example, Millward and Spinney (2011) report lengthier commutes and greater overall travel time for residents of the commuter belt, and this is likely to exacerbate time-stresses inherent in modern lifestyles, thus lowering SWL. In contrast, the inner city is more convenient, but inner-city areas experience a range of environmental and social problems, which would lower residents' SWL. It is therefore not easy to predict whether the mean SWL will be higher in the inner-city or the outer zones. This study aims to assess overall SWL levels in all zones of the rural-urban continuum, and gauge the separate contributions of personal, situational, and geographic variables.

## **2.0 Study Area and Methods**

This study employs data from the Halifax Regional Municipality (HRM), a county-sized metropolitan area in Nova Scotia, Canada, with a 2006 population of 373,000. The Halifax region is highly representative of Canadian, and more broadly North American, mid-sized metropolitan areas, having a diverse and moderately prosperous economy with population growth of about 0.5% per year. Unlike many US cities, there is little inner-city decay, but unlike many Canadian cities there is widespread exurban development within an extensive commuter belt (Millward, 2002, 2010). Exurbanization has been encouraged by cheap land and lax planning controls, both related to the lack of farmable land (most districts have glacially-scoured igneous and metamorphic bedrock). With the exception of a few remote fishing villages, rural households throughout HRM are largely dependent on urban employment.

Data are derived from the Halifax Space-Time Activity Research (STAR) project, which was an innovative survey of both time use and travel activity, employing GPS tracking to geo-reference respondent locations throughout a 48-hour period. A detailed description of the survey design and socio-demographic characteristics of the respondents is available elsewhere (Spinney & Millward, 2010), and only a brief summary is given here.

The survey data collection period began in April 2007 and concluded in May 2008. The primary sampling unit was a randomly-selected household, while the secondary sampling unit was a randomly selected individual member of the household, over the age of 15, who acted as the primary respondent and completed a computer-assisted telephone interview (CATI) questionnaire, carried a cellular-assisted global positioning system (GPS) device for a 48-hour reporting period, and completed a 2-day time-diary survey the 'day after' the 2-day reporting period had ended. GPS information was used to prompt the respondents' recall of events and also to accurately verify the number, timing, and location of all out-of-home activities, including all travel episodes.

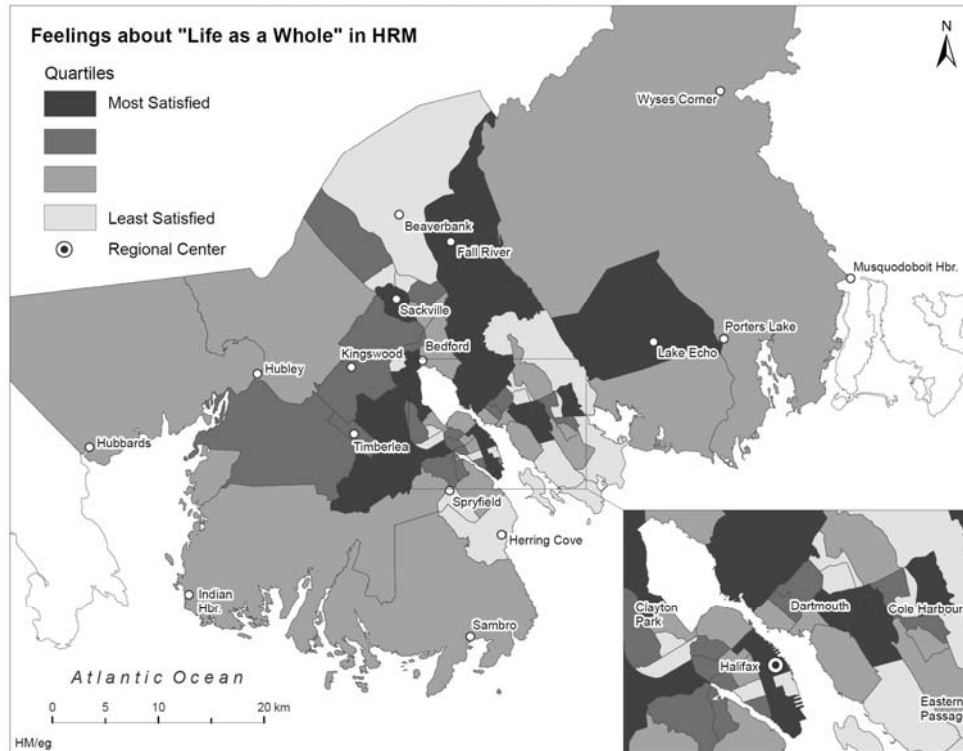
Two-day time-diary and questionnaire data were collected from 1,971 randomly selected respondents. The sample design stratified for season, day of week, age, sex, and geographic zones, but owing to low response rates it was not possible to obtain proportional samples for all groups—younger adults in particular were under-sampled. Geographic zones were based on the rural-urban fringe concept (Wehrwein, 1942; Pryor, 1968; Furuseth & Lapping, 1999; Beesley, 2010), and more specifically on the extent of suburban and exurban development (Lamb, 1983; Bruegmann, 2005; Clark et al., 2009). The four zones were delimited operationally on the basis of both settlement form (i.e., residential density and percentage of area developed) and commuting linkages to the urbanized area, and defined as follows:

- Inner City (IC): Developed urban areas within walking range (c. 5 km) of downtown. They contain 95,000 (25.5%) of the regional population.
- Suburbs: Other contiguous built-up ("urbanized") areas within the urban sewer/water service boundary (50.4% of population).
- Inner Commuter Belt (ICB): Areas beyond the service boundary but within 25 km road distance of downtown Halifax (16.1% of population).
- Outer Commuter Belt (OCB): Areas between 25 km and 50 km road distance from downtown Halifax (5.4% of population).

A map of the zones appears in Millward and Spinney (2011, See Figure 1). It should be noted that the commuter belts for Halifax, so defined, do not overlap with commuter belts for other towns or cities, so that the OCB is largely rural in character and only moderately impacted by commuter development. In contrast, the ICB has seen extensive housing development over the last 20 years, and it is transitional in character (Millward, 2002). An extensive 'remote rural' area lies beyond 50 km from the city center, but it contains only 2.7% of the regional population; the sample in this area was not adequate for statistical analysis, and has been excluded from this article.

The STAR questionnaire survey included a suite of questions typically employed in satisfaction-with-life (SWL) research, and another suite of questions on 'time stress', which is an important correlate of SWL. These questions required subjective self-rating by respondents. Time-diary information on activities, objectively verified through GPS tracking, are also employed. The analysis compares mean SWL ratings for rural-urban zones with mean respondent characteristics. It assesses whether there are significant inter-zonal differences in these mean scores, and also whether significant bivariate relationships exist between SWL and other variables. Since many of the variables considered are highly skewed, rank correlation is employed, and the non-parametric Mann-Whitney difference-of-ranks test is used, in preference to alternative parametric tests.

Figure 1: Feelings about Life-as-a-Whole, Halifax Regional Municipality, Quartiles of Mean Scores for Census Tracts.



### 3.0 Results

#### 3.1 SWL 'Feelings' Related to Rural-Urban Zones

The STAR questionnaire probed for subjective feelings about quality-of-life using standard questions employed in the SWL literature. These questions are the 'global' or 'gestalt' question (feelings about life as a whole right now), feelings of happiness, and feelings about four key 'domains' of SWL (health, job or main activity, other time, and finances). All these feelings variables are inter-correlated with significance levels of 99.9% or higher, typically at Kendall's correlations of 0.25 to 0.30. The global SWL variable is most highly related to the others, at correlations ranging from 0.39 (with health) to 0.49 (with happiness) (See Table 1).

Overall, mean scores for the feelings variables range between seven and eight on a 10-point scale, which accords well with findings reported in the literature (Cummins, 1996). Means for the four rural-urban zones tend to be similar to overall means and to each other, but several exceptions stand out. Most notably, the outer commuter belt (OCB) scores lower than other zones on all six feelings variables. The score is only significantly lower for feelings about job/main activity, but this partly reflects the small sample size in the OCB. Lower scores on all six variables are surely indicative of lower SWL in this zone. The inner city is also exceptional, but to a lesser extent. This zone scores higher than the overall mean on all six variables, and significantly so for feelings about health.

Table 1. Mean Scores for Life-Satisfaction ‘Feelings’ Variables, by Rural-Urban Zones

‘Feelings About...’ Variables (1 worst, 10 best)	Kendall Correlation with ‘global’ SWL*	Rural-Urban Zones (n = no. of valid responses)				
		All Zones n=1,960	Inner City n=393	Suburbs n=1,056	Inner Commuter Belt n=343	Outer Commuter Belt n=168
life as a whole right now (SWL)	1.00	8.11	8.15	8.11	8.15	7.94
happiness (1 worst, 4 best)	0.49	3.51	3.53	3.51	3.53	3.45
health	0.39	7.74	<u>7.98</u>	7.67	7.76	7.51
job / main activity	0.40	7.70	7.79	7.70	7.75	<u>7.38</u>
other time	0.47	7.52	7.60	7.54	7.51	7.24
finances	0.42	7.30	7.48	7.28	7.22	7.15

\*All values significant at p=0.000.

Underlined figures: respondents within and outside the zone have significantly different score rankings at p=0.05 (Mann-Whitney, 2-tailed).

Figure 1 provides a more nuanced view of geographic variations in global SWL, by means of quartile groupings of mean scores for census tracts. Tracts in the inner city and suburbs tend to have a wide diversity of scores, with many in both the 1st and 3rd quartiles, while areas in the commuter belt typically group in the 2nd and 3rd quartiles. Inner-city tracts with high satisfaction include both wealthy and poor areas, while tracts with lowest satisfaction are mostly in poorer suburbs (e.g. Eastern Passage, Fairview), or ICB areas with large trailer parks (Beaverbank). Surprisingly, however, the tract containing both the poor Afro-Canadian communities of Preston and the adjacent modest-income exurb of Lake Echo is in the highest quartile.

### 3.2 Socio-Demographic ‘Controls’

In seeking reasons for rural-urban variations in SWL feelings, we may suppose the existence of rural-urban variations in the causative variables underlying such feelings. From the literature, we know that SWL scores are consistently and significantly related to a group of socio-economic and demographic ‘control’ variables (chiefly income, partner relationship, and vocational situation), although with only modest levels of estimative/predictive power (e.g. Palmore & Luikart, 1972; Fugl-Meyer et al., 2002). It may be, therefore, that higher SWL scores in the inner city and lower scores in the OCB simply reflect socio-economic variations between these zones. It may also be, however, that zonal SWL scores vary because modes and styles of life vary along the rural-urban continuum. That is, inherently geographic factors such as livelihood, population density, access to services, and community character may make life easier/harder, and more or less enjoyable.

Table 2 shows Kendall's rank correlations between the socio-demographic controls and global SWL. There are four statistically significant relationships, two marginally-significant ones, and two which lack significance. Older respondents have significantly higher SWL ratings, as do those with higher household incomes. Married people (formal or common-law) and those living with others also have higher SWL. The availability of a household vehicle adds to SWL, whereas those in full-time work or education have lower SWL. Somewhat surprisingly, education and sex have no effect on SWL.

Table 2. *Mean Scores for Socio-Demographic Control Variables, by Rural-Urban Zones*

Variables & Coding	Kendall Correlation with 'global' SWL*	Rural-Urban Zones (n = no. of valid responses)				
		All Zones n=1,971	Inner City n=397	Suburbs n=1,063	Inner Commuter Belt n=343	Outer Commuter Belt n=168
Sex (1 male, 2 female)	0.00	1.54	1.57	<u>1.52</u>	1.53	<u>1.62</u>
Age (1 to 15, 5-yr cohorts)	0.10	8.02	<u>8.68</u>	<u>8.12</u>	<u>7.32</u>	<u>7.35</u>
Married/common-law (yes 1, no 0)	0.08	0.80	<u>0.72</u>	0.79	<u>0.85</u>	<u>0.89</u>
Household size (one 1, more 2)	0.06	1.88	<u>1.81</u>	1.88	<u>1.91</u>	<u>1.93</u>
Education level (highest 1, lowest 9)	-0.01	3.20	<u>2.82</u>	<u>3.32</u>	3.30	3.17
Household vehicle yes 1, no 0)	0.03	0.97	<u>0.92</u>	<u>0.98</u>	<u>1.00</u>	0.99
Working or student (yes 1, no 0)	-0.03	0.59	<u>0.53</u>	0.60	0.64	0.56
Household income (lowest 1, highest 6)	0.06	4.33	4.19	<u>4.24</u>	<u>4.59</u>	<u>4.61</u>

\* Critical values are 0.06 (significant at p=0.01) and 0.035 (p=0.05). Underlined figures: respondents within and outside the zone have significantly different score rankings at p=0.05 (Mann-Whitney, 2-tailed).



All of these variables show significant variation by rural-urban zones, and thus contribute to inter-zonal variations in SWL. Of particular importance is age: the inner city has the oldest population (boosting its SWL), while the ICB and OCB have much younger populations. Working against this effect, however, household incomes are highest in the commuter belts, boosting their SWL scores. Also, inner-city residents are less likely to be married and more likely to live alone, thus depressing their SWL scores.

### 3.3 Health and Rural-Urban Zones

Physical and mental health impacts strongly on perceived quality of life (Cummins, 1996; WHOQOL Group, 1998; Bukenya et al., 2003; Raphael et al., 1996), and the STAR data contain several objective and subjective indicators of health. Of the four variables related to physical health, self-rated state of health has the highest correlation with global SWL, and this variable also exhibits significant variation by rural-urban zones (See Table 3). The mean rating is highest in the inner city, and lowest in the suburbs. The suburbs also score poorly for physical disabilities and regular sports participation (both self-rated), while the rural areas score slightly better on these measures. An objective variable computed from the time diaries, minutes per day of sport and recreation time, shows more activity per respondent in the inner city, and less in the commuter belt. Perplexingly, however, this variable has no significant correlation with global SWL.

Table 3. Mean Scores for 'Physical Health' SWL-related Variables, by Rural-Urban Zones

Variables & Coding	Kendall Correlation with 'global' SWL*	Rural-Urban Zones (n = no. of valid responses)				
		All Zones n=1,971	Inner City n=397	Suburbs n=1,063	Inner Commuter Belt n=343	Outer Commuter Belt n=168
State of health, self-rated (1 poor, 5 excellent)	0.23	3.81	<u>3.94</u>	<u>3.77</u>	3.80	3.80
Difficulty hearing, seeing, walking etc. (1 often, 3 no)	0.12	2.53	2.54	<u>2.50</u>	<u>2.62</u>	2.55
Regular sports participation, self-rated (1 yes, 0 no)	0.08	0.60	0.61	0.59	0.64	0.63
Sport and recreation time (min/day)	-0.00	26.1	28.0	26.7	23.1	23.6

\* Critical values are 0.06 (significant at p=0.01) and 0.035 (p=0.05). Underlined figures: respondents within and outside the zone have significantly different score rankings at p=0.05 (Mann-Whitney, 2-tailed).

The STAR questionnaire contained five questions related to time stress (standard questions used by Statistics Canada), and two questions related to group/social activity, all of which provide indirect indications of mental health. Time stress (aka ‘time crunch’) is known to negatively affect mental health (Hamermesh & Jungmin, 2007). The time-stress responses are strongly correlated to global SWL, and several of them show significant variation by rural-urban zones (See Table 4). Inner-city residents score lowest on all time-stress measures, and significantly less than other zones on three measures. In contrast, highest levels of stress are reported in both the inner and outer commuter zones. On average, residents in these zones feel significantly more rushed, and have insufficient time with friends and family. The reasons are not hard to find. We have already noted that respondents in the commuter zone are more likely to be employed, and to be married with children, than inner-city residents. They have more demands on their time, and need to juggle time-schedules with other household members. On average they have longer journeys-to-work, and spend more time overall in travel, than do those in the inner-city and suburbs (Millward & Spinney, 2011).

Leisure time is synonymous with recreation, and thus contributes to mental health (Stathi et al., 2002). Time spent in the company of others is also known to promote, or at least indicate, mental health (Miller et al., 1998; Lloyd & Auld, 2002). The STAR time diaries allowed computation of leisure time, time with others, and non-work time with others (See Table 4). These three variables are all significantly related to global SWL, and also vary significantly by rural-urban zones. The inner city shows much leisure time, but also the lowest amounts of time with others (recall that residents here are more likely to be older, not in employment, and living alone). By contrast, the ICB shows least time in leisure, and most time overall with others. Non-work time with others, however, is higher in both the OCB and the suburbs.

Volunteer and group activity are both significantly related to global SWL, and vary significantly by rural-urban zones. Activity is highest in the inner city (where residents have more free time), and lowest in the suburbs. The ICB shows above-average activity, despite high time-stress in this zone.

### ***3.4 Geographic Factors in Rural-Urban Zones***

The literature tends to treat geographic variation in SWL as an outcome of the socio-demographic and health factors reviewed above. Inherently geographic variables related to location, access, and community character are typically treated as incidental or residual influences on SWL, not amenable to analysis. Several questions in the STAR survey, however, allow some assessment of geographic influences, and are reported in Table 5. Four of the seven have highly significant correlations with global SWL, all in expected directions. Particularly important here is “sense of community belonging,” which correlates more highly than do any of the socio-demographic variables in Table 2, and accords well with findings by others (e.g. Prezza & Constantini, 1998; Theodori, 2001; Bramston et al., 2002; Brehm et al., 2004; Townshend & Hungerford, 2010). The inner city scores highest on community belonging, whereas both the suburbs and the OCB score more poorly, but the zonal means are quite similar. When mapped by census tract, however, there is considerable within-zone variation in community belonging. High scores occur in all zones, and seem unrelated to social status or period of development. Low scores seem to relate in part to rental housing in the IC, or to peripheral areas characterized by large-scale commuter in-migration.

Table 4. Mean Scores for 'Mental Health' SWL-related Variables, by Rural-Urban Zones

Variables & Coding (* yes=1, no=0)	Kendall Correlation with 'global' SWL*	Rural-Urban Zones (n = no. of valid responses)				
		All Zones n=1,971	Inner City n=397	Su--burbs n=1,063	Inner Com-muter Belt n=343	Outer Commuter Belt n=168
Often feel rushed (1 daily, 5 never)	0.16	2.11	2.19	<u>2.16</u>	<u>1.85</u>	2.15
Not enough time with family or friends*	-0.23	0.33	<u>0.29</u>	0.32	<u>0.38</u>	<u>0.43</u>
Under stress trying to accomplish more*	-0.24	0.23	0.20	0.23	0.23	0.26
Trapped in a daily routine*	-0.25	0.21	0.18	0.22	0.21	0.26
Do not have time for fun*	-0.24	0.24	<u>0.18</u>	0.25	0.28	0.24
Leisure time (min/day)	0.06	364	370	<u>373</u>	<u>341</u>	<u>340</u>
All time with other (min/day)	0.07	469	<u>420</u>	473	501	497
Non-work time with others (min/day)	0.07	344	<u>322</u>	<u>351</u>	338	358
Avg. hrs./month volunteering (0 zero, 4 >15)	0.05	1.26	<u>1.38</u>	<u>1.19</u>	1.32	1.27
Frequency of group activities (0 zero, 5 weekly)	0.07	2.58	<u>2.79</u>	<u>2.46</u>	2.73	2.51

\* Critical values are 0.06 (significant at p=0.01) and 0.035 (p=0.05).  
 Underlined figures: respondents within and outside the zone have significantly different score rankings at p=0.05 (Mann-Whitney, 2-tailed).

“Unsafe walking after dark” is used as a measure of community safety. There is a smooth rural-urban gradation in perceptions of safety, with the inner city viewed as least safe, and the OCB as most safe. When mapped by census tracts, this variable shows most rural/peripheral areas in the highest safety quartile. The most notable exception is the Beaverbank area, which has several large trailer parks and lower income levels. The least safe areas tend to be poorer rental neighbourhoods in the IC, and the suburbs of Fairview and Spryfield. Wealthier IC and suburban areas, in contrast, are viewed as safe.

Preference for residence in a different neighbourhood has a significant negative correlation with global SWL, as we might expect. It is a measure of geographic dissatisfaction (i.e., an outcome rather than a cause), and is specific to localized areas. Average levels of neighbourhood dissatisfaction are similar across most

zones, though respondents in the OCB are least likely to prefer a different neighbourhood (despite their low sense of community).

Table 5. Mean Scores for ‘Geographic’ SWL-related Variables, by Rural-Urban Zones

Variables & Coding	Kendall Correlation with ‘global’ SWL*	Rural-Urban Zones (n = no. of valid responses)				
		All Zones n=1,971	Inner City n=397	Suburbs n=1,063	Inner Commuter Belt n=343	Outer Commuter Belt n=168
Sense of community belonging (1 weakest, 4 strongest)	0.14	3.03	<u>3.11</u>	<u>3.01</u>	3.06	2.96
Unsafe walking after dark (1 safe to 3, dangerous)	-0.08	1.71	<u>1.89</u>	<u>1.76</u>	<u>1.50</u>	<u>1.38</u>
Prefer to live in different n’hood (1 yes, 0 no)	-0.08	0.16	0.14	0.16	0.16	0.12
Commute time to work (mins, workers only)	-0.06	21.0	<u>15.5</u>	21.4	<u>22.1</u>	<u>26.4</u>
Road-distance to regional centre (km)	-0.01	13.7	<u>4.0</u>	<u>12.1</u>	<u>21.3</u>	<u>31.5</u>
Travel duration, all modes (min/day)	-0.01	97.1	<u>92.3</u>	<u>94.3</u>	<u>107.6</u>	<u>104.3</u>
Travel duration, by car (min/day)	-0.02	73.1	<u>56.3</u>	71.6	<u>90.9</u>	<u>85.2</u>

\* Critical values are 0.06 (significant at p=0.01) and 0.035 (p=0.05).

Underlined figures: respondents within and outside the zone have significantly different score rankings at p=0.05 (Mann-Whitney, 2-tailed).

Mean commute time to work (self-assessed) is a specific measure of inconvenience and expense, and has a significant inverse correlation with global SWL (confirming findings by Frey & Stutzer, 2005). The inner city fares very well in this respect, while the OCB fares poorly. Road distance to the regional centre (a crude measure of access to services and amenities) varies significantly and predictably across the zones, but has negligible correlation with global SWL. However, we should bear in mind here that households self-sort themselves by residential preferences, so that those choosing to live in peripheral zones are trading accessibility for larger lots (and/or cheaper housing) and “country living”.

We might expect that time spent in all travel is viewed negatively, but duration totals computed from the STAR time diaries have negligible correlation with global SWL.

Time durations vary greatly by rural-urban zones for travel by car, but travel time by all modes (including bus, ferry, bicycle, and walking) is perhaps of greater concern to most people, and this is fairly similar across all zones. Also, self-selection would suggest that residents of the commuter zone have a high tolerance for travel.

#### **4.0 Summary and Conclusions**

This research examined how satisfaction with life (SWL) varies for residents in different zones of the rural-urban continuum, within the county of Halifax, Nova Scotia. The main findings can be summarized as follows:

- SWL varies significantly by R-U zones.
- For all domains, SWL is higher in both the IC and the ICB. SWL is lower in the suburbs and much lower in the OCB.
- Self-rated health is a very important predictive factor for SWL, and is highest in the IC.
- Time-stress is also very important. It is lowest in the IC, and high in the commuter belt. It is presumably associated both with the larger families typical of outer zones, and with extended commuting times.
- Socio-demographic characteristics that mediate SWL have only modest correlations with it. The most significant are age, whether married, household size, and household income (all of which vary significantly by R-U zones).
- Intrinsically geographic variables also influence or co-relate to SWL, particularly community belonging (strong in IC, weak in OCB), preference for a different neighbourhood (highest in the suburbs and ICB), unsafe after dark (worst in IC, best in OCB), and commuting time (least in IC, most in OCB).

It is likely that other intrinsically geographic variables, such as land-use mix, housing density, and availability of parks and amenities, may also have significant relationships to SWL, but these are all difficult to evaluate at the level of individual respondents, and were not incorporated in this study.

The above findings throw new light on life-satisfaction research by clearly demonstrating the importance of geographic variables related to regional location, and to neighborhood and community character. The predictors of SWL are different for urban and rural residents, as we might expect, but a simple urban-rural dichotomy masks much complexity. Residents of the suburbs express less satisfaction than residents of the ICB, while residents of the OCB are by far the least satisfied. At the community and neighbourhood levels, the nebulous concept of community belonging is particularly important. These findings have implications for the formulation of land-use, transportation, and health policies aimed at improving perceived life satisfaction. They lend credence to the notion that appropriate regional planning and community design can greatly improve the lives of citizens, both objectively and subjectively, particularly through travel reduction, enhanced safety, and increased opportunities for social interaction.

While the findings above are statistically significant and conceptually intriguing, many questions need to be answered before we gain a full understanding of rural-urban variations in subjective life-quality. The main lines of enquiry are as follows:

- What are the separate effects of all independent variables on satisfaction with life? Multivariate modeling, despite some deficiencies, is the necessary next step to answer this question.
- How important are intrinsically geographical variables, relative to others? Additional social, economic, and environmental variables for each respondent's home neighbourhood need to be considered here.
- At what scale of aggregation is SWL most predictable? SWL scores for individuals are known to be highly unpredictable even with multivariate modeling, but scores aggregated by census tracts or whole communities are likely to be far more predictable.
- Does locational self-selection mean that the determinants of SWL vary by rural-urban zone? This is perhaps the most intriguing avenue of enquiry for rural geographers, and may shed new light on how individuals perceive the costs and benefits of residential location.

## 5.0 Acknowledgment

Financial support for this research was received from the Nova Scotia Health Research Foundation (PSO—Project-2008-4669).

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