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The Multi-Dimensional Nature of Predicting Quality of Life

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Abstract

The array of attributes theorized to impact quality of life (QOL) has sparked research across many fields of study. This multidisciplinary effort has identified influential dimensions such as satisfaction with residence, neighbourhood, economy, social, and community issues. This study expands upon previous research, creating indices to represent dimensions shown to influence QOL, and then using regression analysis identifies the dimensions most likely to increase perceived QOL. The data indicates the combination of community support and residential satisfaction provides the best model for predicting QOL. This research helps confirm the importance of utilizing a multi-dimensional approach in the study of QOL.

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Keywords: Quality of life; multi-dimensional approach; regression analysis; nature of predicting

1. Introduction

1.1. Defining Quality of Life

There are three major philosophical approaches to quality of life (Brock, 1993). Each defines the good life differently: 1) religious or philosophical norms; 2) satisfaction of preferences; or 3) subjective well-being (Diener & Suh, 1997). This paper is a representative of the third approach – subjective well-being. The underlying presumption of the approach is that we must examine how a person feels about their life to understand their well-being or quality of life. A variety of terms such as happiness (Shin & Johnson,

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1978), well-being (Andrews & Withey, 1976) and life satisfaction (Diener & Lucas, 2000) have been used quite interchangeably to address the topic of quality of life (Bramston et al., 2002; Rapley, 2003). The most useful evaluations of quality of life are likely to include, if not at least differentiate between, objective and subjective life quality estimations. The objective approach typically focuses on the analysis of secondary data at an aggregate level - e.g., neighbourhood, community, county, etc. - whereas the subjective approach utilizes primary data collected at the individual level, using social survey methods (Marans & Stimson, 2011). While both provide useful information for understanding quality of life in general, data collected on measures do not always agree between the objective terms and their subjective counterparts (Rapley, 2003).

Although the type of quality of life measures most appropriate for use depend upon the field of study and the research question which is to be addressed, research has shown that use of a multi-dimensional structure is advantageous when measuring and predicting quality of life (Bramston, Chipuer & Pretty, 2005; Matarrita-Cascante, 2010; Perry & Felce, 1995;). Some factors found to be consistently important when assessing quality of life include having a sense of purpose or a role, support networks, income and wealth, health, having time, and also having a sense of independence (Grewal, Nazroo, Bajekal, Blane & Lewis, 2004). Other common measurements include questions focused on social well-being, personal development, as well as autonomy and choice (Perry & Felce, 1995) in addition to the generally accepted standard measures of material well-being, emotional well-being, health, safety, learning, community involvement and intimacy used in the Comprehensive Quality of Life Scale (Cummins, 1997). Like the researchers mentioned above, Bramston et al. (2005) used a multidimensional approach evaluating quality of life using measures of both satisfaction and importance in material well-being, health, productivity, intimacy, safety, community, and emotional well-being.

Dimensions can vary across life areas as well as between levels which are individually-based through more expansive community-based levels. While determinants related to quality of life have been investigated at both the individual and community levels, results have been somewhat inconsistent in determining the impact that community factors have on how one perceives their own quality of life (Bramston et al., 2002; Butler & Ciarrochi, 2007). Nonetheless, past research has noted a positive relationship between a community's services and conditions, and community satisfaction and overall quality of life (Epley & Menon, 2008; Sirgy & Cornwell, 2001; Sirgy, Gao & Young, 2008; Sirgy, Rahtz, Cicic & Underwood, 2000). According to Goudy (1990), it is "evident that some ideal social dimensions exist across communities" (pg. 285). His findings indicate that higher community attachment; higher ratings of local services and opportunities; and higher quality of life evaluations are all related to positive social dimension ratings in communities. Marans's (2002) concludes there is considerable evidence to show that "place" matters when it comes to quality of life and such studies help us understand the meaning of quality of life and how it might be measured. Thus, it is clear that the inclusion of community factors in addition to individual factors continues to warrant further consideration in the study of quality of life. It provides the contextual background of community and community factors that influence the individual subjective perception of the quality of life.

Bramston et al. (2002) state that "the importance of empirically demonstrating the causal impact of specific determinants on subjective quality of life cannot be underestimated" (pg. 272). They emphasize the importance of testing for longitudinal changes in variables over time, particularly those related to individuals, in order to continue to build a greater understanding of quality of life. Considerations need to be made of area size, time frame of data collection, population composition, life composition domains, use of objective and subjective measures as indicators, measurement scales, inclusion of key decision makers, function of quality of life model, population distributions, and residential distance impact when studying quality of life (Michalos, 1996). The need continues to be expressed for further research aimed at understanding the complexity of components which comprise the general topic of quality of life (Auh

& Cook, 2009; Diener & Suh, 1997; Sirgy, 2011). Greater analysis and evaluation of indices for predicting increases in satisfaction with one's quality of life would be of great benefit for continued research in quality of life research across all fields of study.

1.2. Hypotheses

Research has shown that multiple factors contribute to overall satisfaction levels of perceived quality of life. Individual residential satisfaction, neighbourhood, and community support are hypothesized in the current study to each have an impact on how likely one is to be satisfied with perceived quality of life such that the higher one's satisfaction with residence, neighbourhood and community support, the higher satisfaction with quality of life will be perceived. It is also believed that a multi-dimensional model including each of the aforementioned areas will be a better predictor of quality of life satisfaction than any one single-predictor model. We will also identify the relative importance of each of the factors in the model.

2. Methodology

2.1. Subjects

Our research community of Crete, Nebraska (USA), a small town (2010 census population: 6,021) in a rural setting, has experienced demographic changes due to the arrival, over the past 15 years, of mostly racial/ethnic minorities seeking work in the local food processing plants. In order to insure an adequate representation of the residents of the community, two distinct sampling blocks were determined using the U.S. 2000 census. The first group of blocks was based on those which were identified in the 2000 Census as having 5 or more racial/ethnic minority residents; the second group consisted of all remaining blocks. A sample of blocks from each type was randomly drawn in order to provide a Simple Random Sample (SRS) for surveying. This design was applied in an effort to obtain a representative sample of the diverse group of both long-term and newly arrived residents living within Crete. Interviewers went door-to-door to the households on each of the randomly selected blocks in order to seek survey participation by an eligible household member. Eligible members were defined as individuals living within the household for either five years or less (newly arrived residents) or fifteen years or more (long-term residents) and meeting a minimum age criteria of 18 years of age. The sample included 85 males (51.5%) and 80 females (48.5%). Sixty percent (n=99) of the total sample had lived in Crete for 5 years or less, whereas 40% had been residents for fifteen or more years (n=66). The mean age of participants was 40.6 years. The mean length of residency in Crete was 13.5 years and the mean length of residency in their home was 7.9 years.

2.2. Apparatus

Respondents were taken through a 117 item questionnaire based on the 111 item questionnaire used in the 2001 Crete study. The majority of questions from the 2001 survey remained as originally asked and covered a broad range of topics pertaining to the residential experience of living in the Crete area. Specifically, perceptions about residency were asked under topic headings such as Current residence, Resident satisfaction, Privacy, Housing concerns, Changes in Crete, Priorities, Contributors to the current housing condition, Physical issues, Service issues, Social/cultural issues, Economic issues, Stress-related concerns, Social support, and Health-related issues. Neighbourhood and city level topic headings included physical issues, service issues, social and cultural issues, economic issues, stress related

concerns, social support, and health related issues. The 2008 survey also included the addition of a specific quality of life question which read, “Thinking about your own life and personal circumstances, how satisfied are you with your quality of life as a whole?” Respondents were asked to reply based upon a 1 to 5 scale where 1 represented completely dissatisfied and 5 represented completely satisfied. General demographic information was captured as well as overall open-ended sentiments about what residents like about Crete and what they would like to see change in Crete.

2.3. Procedure

Households on each block were approached until 5 eligible participants had completed the survey. High minority blocks had native Spanish speakers or bilingual interviewers available to take respondents through the interview in either English or Spanish. Completed survey data was entered into a database to be used for analysis.

3. Results

3.1. Likely factors of influence on quality of life

The effect of creating indices from combining multiple items of a like construct can be of great benefit when predicting complex, multi-dimensional variables such as quality of life. It is difficult for a single item to entirely represent a highly complex concept. Use of indices can be a way to achieve better validity and reliability when measuring complex constructs such as quality of life. Individual items under various topic headings were analyzed to create multiple conceptual indices (mean score of related items) for use in predicting quality of life. Reliability analyses using Cronbach’s alpha was used to create indices from various Likert-type items. The indices created for evaluation include: Residential Satisfaction, Changes in the Community, Neighbourhood Characteristics, Social/Cultural Issues, Service Issues, Economic Issues, and Social/Community Support (see appendix A for indices details). All indices proposed for use have a reliability near or above .7 which is generally considered the standard for a “reasonable” level of acceptance as an index for analysis (George & Mallery, 2003). Cronbach’s alpha scores are used to describe the internal reliability of each life factor index and have been provided in Table 1.

Table 1. Reliability of life factor indices

Life Factor Indices	Cronbach’s Alpha
Residential Satisfaction Scale	.785
Changes in the Community Scale	.776
Social/Cultural Issues Scale	.653
Service Issues Scale	.775
Economic Issues Scale	.699
Neighbourhood Characteristics Scale	.771
Social/Community Support Scale Option	.631

Correlation analyses was run to examine potential relationships of influence between each life factor index with perceived overall quality of life, and other possible contributing variables, discussed in the

literature. All of the items correlated significantly ($p > .01$) with the overall sense of quality of life. Medium strength correlation ($> .3$; Cohen, 1988) was found between quality of life and residential satisfaction, changes in the community, and economic issues. Although the relationships were not as strongly correlated, quality of life was also found to be significantly correlated to changes in the community, service issues, social/cultural issues, social/community support, and neighbourhood characteristics. In addition stress, health, and housing situation in the community also proved to be significantly correlated with overall quality of life (see Table 2).

Table 2. Correlations between life factor indices and other possible confounder/contributors with overall quality of life satisfaction

Life Factor Indices and other contributing factors	Pearson Correlation
Residential Satisfaction Scale	.324**
Changes Scale	.313**
Economic Issues Scale	.309**
Social/Community Support Scale	.262**
Service Issues Scale	.223**
Neighbourhood Characteristic Scale	.219**
Social/Cultural Issues Scale Option	.329**
Other factors:	
Health	.351**
Stress	-.249**

* $p < 0.05$; ** $p < 0.01$;

3.2. Regression results

An ordinary least squares (OLS) regression model was used to test which indices exert the greatest influence on satisfaction with quality of life. The model included all of our life factors indices, as well as the two additional potential influential factors identified in the correlation analysis (with a $p > .01$). We also added age and gender as control variables (indicated by the literature). Overall the regression model proved statistically significant (ANOVA F-test $< .0001$), although not particularly strong in predictive quality ($R^2 = .299$); however, we were more interested in determining influential factors on quality of life, rather than predictive ability. The results of the regression analysis indicates that (in order of influence, according to their beta standardized coefficient) the health status of the resident, their perception of the economic situation of the town, and their level of residential satisfaction positively influenced their perception of over quality of life, while their level of stress exerted a negative effect (controlling for resident age and gender). The model is shown in Table 3.

Table 3. Regression of Life Factor Scales (Indices) on Satisfaction with Quality of Life

Life Factor Indices (Independent Variables)	Unstandardized Coefficients (B)	Standard Error	Standardized Coefficients (β)
Residential Satisfaction	.220*	.166	.166
Economic Issues Scale	.222*	.202	.202
Social/Community Support Scale	.128	.124	.124
Service Issues Scale	-.047	.127	-.032
Neighbourhood Characteristic Scale	.083	.107	.064
Social/Cultural Issues Scale	-.116	.088	-.108
Changes in the Community Scale	.150	.113	.116
Other factors:			
Health	.225**	.073	.232
Overall level of stress	-.126*	.063	-.145
Gender = male	-.135	.145	-.927
Age	-.002	.004	-.475

* $p < 0.05$; ** $p < 0.01$;

^a Dependent Variable: "Thinking about your own life and personal circumstance, how satisfied are you with your quality of life?"

4. Discussion/Conclusions

An individual's satisfaction with their residential situation, their neighbourhood, and support they receive from their community were hypothesized to have an impact on the individual's perception of their quality of life. It was determined that, as hypothesized, each of these factors, as measured by the developed indices comprised of survey items relevant to the factor, was significantly correlated (low to medium strength) to quality of life ratings such that the higher one's satisfaction with residence, neighbourhood, and community support, the higher satisfaction with quality of life. It was also found that health (independent of age and gender), as suggested by other researchers (Grewal, Nazroo, Bajekal, Blane & Lewis), exerts a strong influence on satisfaction with quality of life. (Michalos, Zumbo & Hubley, 2000, found health status plus domain satisfaction explained 63% of satisfaction with overall quality of life). Also, the research results confirms previous research findings (Bramston, Chipuer & Pretty, 2005; Matarrita-Cascane, 2010; Perry & Felce, 1995) that a multi-dimensional concept model aggregating multiple individual factors (indices), that include place-based characteristic (Marans, 2002) which highlight the effect of where one lives--neighbourhood characteristics (Muhajarine, Labonte, Williams & Randall, 2008), is an appropriate approach to the investigation of quality of life (Marans, 2012).

Although the survey sample available for analysis in the current study was limited in size, the findings are promising and help to clarify and support the need for inclusion of multi-dimensional approaches when studying quality of life. The findings within the current study help to confirm the necessity of including both individual level factors, such as residential satisfaction, and community level factors, such as community support and economic well-being (Epley & Menon, 2008; Sirgy, Gao & Young, 2008), as well as the concept of personal utility (Sirgy 2011), which includes perceived levels of stress. Although previous research has been inconsistent in support of community measures, community support has been

shown in the current study to be of significant impact in increasing one's perception of overall quality of life. These results imply that community level factors should receive critical attention in any efforts aimed at increasing quality of life for residents of a community. Thus, availability and access to health services in the community would play an important role in the quality of life of its residents. This would be of particular importance in smaller towns within a rural setting, such as our case study community.

The life factor indices created in the current study can help to serve future research endeavours of measuring and predicting quality of life. While not all life factors were found to be of significant influence on quality of life, larger sample sizes may substantiate their relevance in defining the complete context surrounding quality of life. Also, it is probable that some of the factors within the index concepts overlap, thus masking their individual effect on overall quality of life measures; or, there might be an additive effect of the factors on quality of life. However, the life factor indices presented can serve as preliminary measures for theoretical and analytic purpose.

This case study also contributes to our understanding of quality of life issues within the context of small towns in urban settings, which receive considerably less attention in the literature (vis á vis large urban areas) (Filkins, Allen & Cordes, 2000).

Future areas of further research suggested by our results would be to explore how the individual factors interact with one another (create indices with different individual factor composition), explore possible additive effects (joint effect of the presence of several factors together), variations in the composition of factors affecting different groups (e.g., cross-cultural) (Camfield & Skevington, 2008) or population groups (e.g., racial/ethnic minorities, long-term residents versus new arrivals), and the length of residency in the community (longer the residency, the stronger the attachment to the community and better perception of the quality of life). Continued research, particularly across multiple fields of study and longitudinally (Bramston et al., 2002; Auh & Cook, 2009; Diener & Suh, 1997; Sirgy, 2011), within diverse populations, will be of particular value to refining the ways in which quality of life is defined and measured with hopes of someday providing clear methods for improving quality of life for global benefit.

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Appendix A.

A.1. Residential Satisfaction Index

- Satisfaction with the size of residence
- Satisfaction with fire safety in residence
- Satisfaction with crime safety in residence
- Satisfaction with outdoor activity area
- Satisfaction with off street parking
- Satisfaction with rent/mortgage and utilities paid
- Satisfaction with overall physical condition of residence

A.2. Community Changes

- Sense of community
- Quality of housing
- Availability of housing
- Affordability of housing
- Cultural relations
- Crime conditions
- Crowding conditions
- Economic conditions

A.3. Neighbourhood Characteristics

- Overall visual attractiveness of the neighbourhood
- Adequacy of services in the neighbourhood
- Garbage collection in the neighbourhood
- Traffic that goes through the neighbourhood
- Parking of cars in the neighbourhood
- Quality of air in the neighbourhood
- Visibility of trailer parks

A.4. Service Issues

- Access to convenient public transportation
- Adequacy of health services
- Quality of education services
- Availability of English as a second language
- Access to recreation services (e.g., parks)
- Availability of entertainment (e.g., restaurants, movies)
- Affordability of day care services
- Level of police protection
- Level of fire protection accessibility of basic supplies (e.g., food)
- Accessibility of retail

A.5. Social/Cultural Issues

- Cooperation among neighbours
- Cross-cultural understanding
- Sense of community in town

A.6. Economic Issues

- Availability of employment
- Town's ability to attract new businesses
- Well-being of businesses
- Overall economic condition of the people

A.7. Social/Community Support

- Social organizations provide financial or social support when in need
- Can rely on friend for support in times of need
- I talk to my neighbours all of the time
- I can rely on neighbours for help with everyday kind of things