

ADVANCING QUALITY OF LIFE
IN A TURBULENT WORLD

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ADVANCING QUALITY OF LIFE IN A TURBULENT WORLD

Edited by

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*For Isabella, Andrew, Kieran, Chelsea, Ryan, Lucas, Jack Michael and all
other children who, in time, will inherit the earth and will need
to work together to bring about a more positive future
for themselves and others.*

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Preface

Environmental issues continued to loom large in the last decade of the twentieth century, especially environmental problems related to rising levels of CO₂ emissions and other greenhouse gases on the planet's average temperatures and, subsequently, storm patterns. Floods and droughts, in combination with unseasonably high and low temperatures became the norm rather than the exception for large expanses of Africa, Asia and Oceania. Even large areas of Europe and North America were subjected to recurrent floods and droughts and experienced unseasonable extremes of hot and cold temperatures associated with man-made intrusions into the natural environment. And, still, a global plan of action to halt man-related patterns of deforestation, desertification, and over-fishing of the seas has yet to come into being.

At the same time, the number of regional conflicts and civil wars increased and, with them, the lives of many women, children, old people and other non-combatants were lost in these conflicts. Increasingly, regional wars and conflicts had less to do with disputes over land or other natural resources but more with the differing social, political and religious identifications of the people engaged in these conflicts. Warnings of genocide and near-genocide conditions were commonly proclaimed to the world community but, sadly, the planet's international security apparatus proved to be largely ineffective in containing many of the worst of these atrocities. As a result, hundreds of thousands of people, eventually millions, died while awaiting assistance from the global community to bring an end to their suffering. Some nations, forming a "coalition of the willing," adopted a policy of pre-emptive intervention in an effort to halt what they perceived to be the most egregious assaults on world peace and humanitarian values but, in the process, unwittingly laid the foundation for other nations to adopt the same policy in pursuing less noble goals. Certainly, the threat of sectarian conflict and the much discussed "clash of civilizations" looms larger today than at any time in the recent past.

Against the backdrop of environmental failure, regional conflicts, and civil wars large parts of Sub-Saharan Africa and South Asia also were subjected to recurrent hunger and famines. Rain simply did not fall with the regularity or in the quantities that it had for centuries before and, when the rains did eventually come, they came in the form of fierce storms that eroded the precious top soil needed to

produce food and care for livestock and other animals. Floods in combination with droughts, earthquakes in combination with tornadoes and other powerful natural forces, and rapid shifts in temperatures from extreme cold to extreme heat became typical in many regions of the world. Even Western and Southern European nations found themselves unprepared for the sudden environmental challenges that confront them.

During the last decade of the twentieth century, *Human Immunodeficiency Virus* (HIV) and *Acquired Immunodeficiency Syndrome* (AIDS) also continued their course of infecting and, in time, bringing death to hundreds of thousands of people each year—many of them women and children who did nothing to incur the original infection. *Severe Acute Respiratory Syndrome* (SARS) also emerged on the global stage and, in recent years, the threat of a widespread *Avian Flu* pandemic has surfaced. And, still, millions of children die each year from malaria, tuberculosis, and other contagious diseases for which inexpensive and readily available vaccines and cures already exist. And, today, diseases long believed to be under control—anthrax, botulism, smallpox—have been developed into “weapons of mass destruction” (WMD) for use by potential terrorists and other for use against their own people and those of other nations.

And, yet, threats to global well-being are not uniformly distributed. Indeed, the quality of life for many of the world’s richest economies has reached an all-time high. “Happiness,” “life satisfaction,” “well-being” all rank more favorably among economically advanced countries than among poorer ones; and the average scores on these metrics for rich countries continue to show improvement over time. No, the problems of global disharmony and conflict, though they touch rich countries in many important and serious ways, are far more concentrated among the world’s poorest and middle-income nations, thereby, surfacing yet another gap in development between the world’s “social haves” and “social have nots.” The problem would be less serious if it were not the case that “social haves” comprise only about 17% of the world’s total population while “social have nots” account for 83% of the total—almost all of them located in developing Asia, Africa, and Latin America. Even more to the point is the reality that the 17% of the world’s population that lives in comparatively well-off countries depend disproportionately for their high standard of living on the goods and services they import from “social have not” nations (e.g., energy, food, inexpensive labor, etc.).

The Sixth International Conference of the International Society for Quality of Life Studies (ISQOLS)

It was with the preceding backdrop that the International Society for Quality of Life Studies (ISQOLS) convened its 6th international conference in Philadelphia, Pennsylvania. Approximately 350 quality of life researchers from 65 nations attended the conference and, together, struggled to formulate ways to understand and, subsequently conceptualize and measure the profound social, political and economic changes taking place at all levels of social organization throughout the

world. All in attendance at this biennial meeting shared a keen commitment to using their skills in the service of improving the world situation, albeit in capacities appropriate to their roles as educators, researchers and scholars. Approximately 250 presentations were made during the conference—the majority of which focused on approaches that might be taken to advancing quality of life worldwide. By now many of these contributions have found their way into other publications—as books, monographs, invited chapters or articles in quality-of-life-related journals and publications. Other presentations have served as the basis for specialized conferences or as background documents for important “white papers” seeking to bring about broad-based social, economic and political change.

This Volume

This volume includes a selection of the very best papers presented at the Philadelphia meeting of ISQOLS. The papers are grouped into three parts. *Part I* contains three papers that focus on regional and national perspectives on advancing quality of life for large aggregates of people. Particular attention is given in Part I to the quality of life challenges that confront the United Kingdom, Croatia and, now, a significantly enlarged European Union ($N = 25$). Each chapter provides keen insights into the special development issues confronting their nations and regions and, in turn, serves as a case study for exploring alternative approaches to advancing quality of life theory, assessment and practice under conditions of considerable change . . . sometimes conflict.

Part II contains six chapters that focus on understanding and advancing quality of life in selected sectors of special interest to quality of life researchers and practitioners: transportation, health, economic development, sustainable development, energy, and socio-religious-cultural integration. Part II also deals with issues of core values of concern to people everywhere and concludes with two thoughtful papers that examine the relationship between quality of life, hope, and spirituality.

Part III contains four papers that focus on quality of life challenges that confront particular population groups of special interest to quality of life researchers. Common to all four papers is their concern for families, children, the elderly, persons with serious physical or emotional disabilities and, more broadly, the degree of social attachment experienced by these population groups to larger communities. Characteristically, each paper draws on different theoretical and methodological traditions for explicating the dynamics that influence levels of quality of life experienced by each group studied. Each chapter, in turn, offers a somewhat different set of recommendations for advancing quality of life for both the populations studied directly and for the world-as-a-whole.

In all, the 13 papers included in *Advancing Quality of Life in a Turbulent World* reflect the considerable diversity that exists in the conceptualization and measurement of “quality of life.” The chapters also reflect considerable diversity

with respect to practical approaches that can be taken in advancing quality of life for people worldwide. Readers interested in “quality of life” as a construct for informing their own research and practice will find the volume informative and challenging.

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Part I

**Regional and National Perspectives on
Advancing Quality of Life**

How Does European Union Enlargement Affect Social Cohesion?*

WOLFGANG KECK AND PETER KRAUSE

Introduction

With the enlargement of the EU in May 2004 to include ten new member states, the social situation in the New Member States (NMS) has become more closely entwined than ever before with the social situation in the older member states (EU 15). This means on the one hand that the policy strategies and institutional regulations guiding EU and national policy decisions and activities now are being applied to the NMS as well. On the other, this process of social integration creates new frames of reference for people to compare their living conditions. The growing interconnectedness and integration within the EU widens the scope of both mobility and comparability.

To avoid negative effects such as brain drain from poorer to richer countries and growing frictions between regions of the EU, the European Commission has attempted to reduce disparities in the social situation between countries and social groups, or at least to prevent a widening of the existing gaps in living conditions and quality of life. The debate on these issues coalesces around the term “social cohesion.” Although the notion of social cohesion leads a shadowy existence in the social sciences,¹ the term is attractive in policy making. The World Bank, the Club of Rome, the OECD, several governmental and NGO initiatives and the European Commission use the term social cohesion as a central policy objective and a measure for the success of policy outcomes (Jenson, 1998, p. 4ff).

Social cohesion has also become a central term for EU social policy (European Commission 1996, 2001, 2004, “Cohesion reports”). It is understood here in a broad sense as a form of solidarity and mutual support, referring to the “harmonious development” mentioned in Article 130a of the Treaty of the European Union. However, policy approaches to the issue of social cohesion tend to concentrate on objective living conditions and to ignore the aspect of shared values, which forms an integral part of other conceptualizations of social cohesion (Jameson, 1998; Berger-Schmitt,

* The authors thank the European Foundation for the Improvement of Living and Working Conditions for their allowance to use the data from their European Quality of Life Survey.

2000). Therefore, we propose that the concept of social cohesion be integrated into the multidimensional concept of quality of life, which is currently “probably the most prominent and widely used theoretical framework for assisting the living conditions in a society” (Berger-Schmitt, 2000, p. 2). The quality of life approach defines a basic framework of life domains in which social inequalities play an important role. A broader framework that covers people’s life situations in several life domains should thus be adopted to give also a more comprehensive account of social cohesion (see Fahey *et al.*, 2003).

In this paper we deal with cross-country inequalities and degrees of deprivation in the EU on the eve of EU enlargement using indicators from the “Quality of Life in Europe” database (European Foundation, 2004a). We understand social cohesion as part of an integrated concept embracing qualitative as well as quantitative aspects of quality of life under the normative assumption that a certain degree of social inequality endangers the social order and counteracts integration processes. Our empirical focus is on the two core life domains that also take center stage in EU policy debates: (1) employment and working conditions and (2) economic resources and social exclusion.

Our empirical analysis goes beyond the mere objective description of living conditions by EU bodies, adding a range of subjective indicators that provide a more comprehensive picture of the cohesiveness of the enlarged EU. We use macro indicators as the basis for addressing three questions. On a descriptive level, we illustrate the extent of (positive) cohesion in (1) the processes of convergence that has taken place since 1990 and (2) the convergence within the EU member states on the eve of enlargement (2000–2003). While it is rational to distinguish between the EU-15 and the NMS in terms of their very different historical processes and political developments, these same countries frequently show strong similarities in social situation. Hence, we conduct a cluster analysis to determine which of the EU countries show close similarities in their social situations. The cluster analysis provides a somewhat different picture compared to the old/ new member states distinction.

The Concept of Social Cohesion

The term social cohesion can be adapted to different concepts that highlight social disparities and social inequalities, such as social in-/exclusion, belonging/isolation, participation/non-involvement, recognition/rejection (Jenson, 1998; Maxwell, 1999). Hence, the concept of social cohesion is used to identify and combat disparities in different areas of society. This is one reason why the concept has become so fashionable in political discourse: on the one hand it offers an umbrella term for different kinds of social inequalities, and on the other, it contains a clear normative distinction, asserting that inequalities should at least not increase further (Bernard, 1999).

For the European Commission, the concept of social cohesion is used mainly in the context of reducing disparities—unequal access to employment opportunities, income inequalities, etc. (European Commission, 1996, p. 14)—within the various regions of the member states. But it also is used in the context of social exclusion, which must be combated as well in order to reduce the inequalities between social groups. The semantic of equality is accompanied by a concept of

efficiency (positive convergence) in improving the working and living conditions of the citizens of the member countries and increasing economic growth (European Commission, 1996, p. 15). In this sense, the EU approach conceptualizes social cohesion as the convergence and improvement of living conditions between and within countries. However, the EU objective of achieving social cohesion entails not only supporting each individual country in its own economic and social policy but also developing a benchmarking strategy to promote mutual learning processes and closer integration among the member states (European Commission, 1996; Delhey, 2004). Thus, the first cohesion report evaluates social cohesion in practical terms as “any narrowing of differences in individual access to employment and a reduction of poverty . . .” (European Commission, 1996, p. 38).

Reduction of economic and social disparities does not necessarily contradict the diversity of European societies, each with its own unique course of development. Taking into account the differences in the welfare systems of the EU countries, the European Commission developed an open method of co-ordination. This makes the implementation of social cohesion a national task to be adapted to the specific national situation, and to be defined and evaluated by the national action plans (NAP). At a European level, only a guiding framework of general policy goals and a monitoring tool, including a framework of common indicators, have been developed to define a standard for comparing the effects of the national activities (Atkinson *et al.*, 2002; Social Protection Committee, 2001). In addition, the European Commission has established a second means of policy intervention on a transnational level to obtain social cohesion: the EU structural funds, which provide the means for economic advancement in a wide range of social, infrastructural and economic fields. Much of this support is provided to less-developed regions of the EU. Disparities in economic performance between a region and the EU average are one of the main benchmarks for determining where to direct subsidies.

The Commission’s usage of social cohesion is narrower, focused mainly on the idea of convergence and similarity. A certain extent of social inequality could thus be judged as endangering social integration overall. But as Jan Delhey (2004) pointed out, convergence and similarity between regions and citizens does not give any information about their degree of interrelatedness. “Even very similar countries can co-exist without taking any notice of each other and without any ‘we-feeling’” (ibid.: 8). Analogously to the terms “integration” and “social capital,” cohesion refers to the connection among elements in a social entity. These interrelations and their measurement should be a central part of the social cohesion concept. Moreover, social cohesion inherently implies the idea of equalization. Equality, stability, and consensus are the underlying ideas that lead to continuity and predictability (OECD, 1997, p. 7). The normative bias contained in the idea of making things equal is opposed to increases in social inequality through rising income disparities, widespread social exclusion and high levels of unemployment. However, the notion of equalization within the concept of social cohesion becomes questionable if the objective of convergence is understood as leveling things of an unequal nature (see Cohen, 1989; Krebs, 2000).

Social cohesion remains a vague concept as long as it is not applied to distinct social fields. There have been some attempts to relate the social cohesion concept to more specific debates on social inequality. Regina Berger-Schmitt, for example,

discusses social cohesion in the context of social exclusion and social capital (2000, p. 3ff). Considering that social exclusion is itself a multidimensional concept covering deprived life circumstances in several life domains, it can easily be applied in a more general approach. The quality of life approach may thus offer a framework to situate the social cohesion concept. There are at least two aspects which make a combination of quality of life and social cohesion fruitful:

- (1) Social cohesion shifts the perspective from mere discrepancies in quality of life to an understanding of inequality. This is not entirely new. Since researchers are generally aware of the social consequences of such discrepancies and understand them as inequalities, they inquire into their emergence and impact. But the normative connotation of social cohesion, which sees inequalities as a source of social cleavages, focuses on inequalities between high and low levels of quality of life measures.
- (2) The quality of life approach sets distinct standards in two dimensions. It enhances the orientation toward (material) resources by including capabilities and outcomes as crucial levels of quality of life. And it promotes subjective measures besides the standard set of indicators on objective living conditions.

This article maintains the Commission's perspective on convergence as social cohesion, although the authors are aware of its limits. However the Commission's approach is broadened in a threefold manner. First, social cohesion is not seen as differences between countries and regions but as differences between people in countries. Therefore, all national figures are weighted by the population size of the countries to calculate cross-national measures. Second, the social cohesion framework will be enhanced conceptually by referring to the quality of life approach. Third, the link to the quality of life approach widens the narrow perspective on objective resource-orientated indicators to include subjective outcome-orientated measures. The EU standard indicators on social exclusion, the Laeken indicators (Social Protection Committee, 2001), are defined as objective measures, ignoring recent research which highlights opportunities and capabilities to convert resources (Sen, 1999), as well as perceptions on social inclusion which result from the conversion of resources (Boehnke, 2004).

The following analysis applies this understanding of social cohesion within a quality of life approach to inquire into the cross-national inequalities between the current EU member states. It presents a balance sheet on social cohesion in the enlarged European Union, comparing the developments since 1990 using three time periods (1990–1992, 1995–1997, and 2000–2003). In addition, the situation on the eve of EU enlargement will be highlighted. The emphasis is placed on two core domains—employment and working conditions, economic resources and poverty—which take center stage in the EU social cohesion reports and have a strong impact on quality of life and life satisfaction (Delhey, 2003; Alber and Fahey, 2003). Considering only two domains means leaving aside various other important aspects like family, social participation, health, housing and environment, etc. However, the analysis has to rely on comparative data for almost all of the 25 member states. There are still huge gaps in social reporting over time, data collection, and data comparability, particularly in the new EU member states which limit the spectrum of comparable aspects.

Database and Methods

The data used here are from the database on Quality of Life in the EU which the authors provided to the European Foundation for the Improvement of Living and Working Conditions (www.eurofound.eu.int). The concept of the database is geared toward a conceptual framework on monitoring quality of life (Fahey *et al.*, 2002). Twelve life domains have been defined with reference to recent national or Europe-wide indicator systems (Noll, 2002; Cummins, 1996; Erikson, 1993). In each domain, up to 15 key indicators illustrate objective living conditions, their subjective assessment or perceptions about them, and context information on social structures. The database combines a comprehensive, multidimensional account of quality of life together with the focused approach of a limited portfolio of indicators to provide clear, policy-oriented insights (see Atkinson *et al.*, 2002). The indicators are taken from comparative surveying and reporting enterprises. On the one hand, standard indicators from transnational bodies (European Union, United Nations, OECD) were adopted. On the other hand around two-thirds of the indicators were generated from international micro datasets like the European Community Household Panel, Eurobarometer Surveys, and the European Quality of Life Survey. The data are provided on three standard subcategories: sex, age, and income quintiles, if the information is available.

Taking into account that quality of life refers to both objective living conditions and subjective well-being, the analysis broadens the standard set of structural indicators constantly reported by the European Commission. In each domain, subjective assessments complement and contrast the objective living conditions² (Table 1).

Table 1. Selected indicators.

Domain	Labor market		Resources	
Section	Employment	Working conditions	Living standard	Poverty and deprivation
Objective indicators	Employment rate, Unemployment rate	Working hours	GDP per capita Gini S20/S80 ratio	At risk poverty
Subjective indicators	Likelihood to loose Job	Job is demanding and stressful Work to tight deadlines Partner/family gets fed up with job pressure Job prevents giving time to family	Satisfaction with standard of living	Risk to fall into poverty Difficulties to make ends meet Unable to pay scheduled bills

On the basis of these macro-indicators the extent of (positive) cohesion will be illustrated in two dimensions (1) processes of convergence that has taken place since 1990 and (2) convergence within the EU member states on the eve of enlargement (2000–2003).

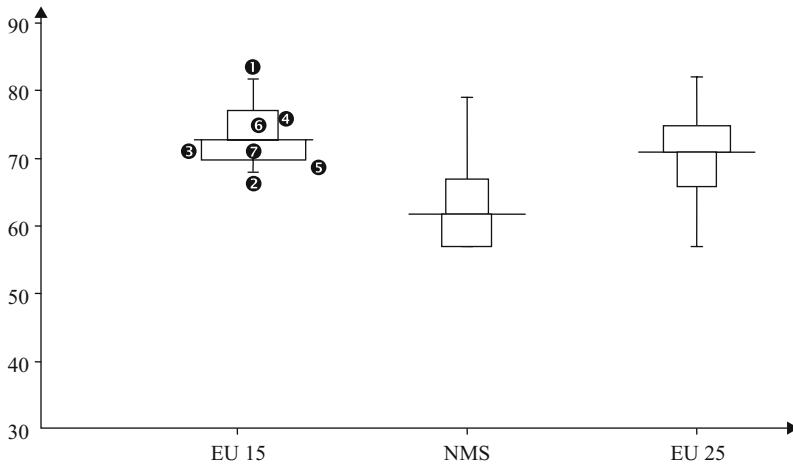
All indicators are population-weighted. The reason is that the figures should represent the situation of individuals in the European Union. Therefore, population weights describe a more detailed picture of how many people are affected by a specific circumstance, instead of comparing the mere number of countries. On the other hand, the weighting procedure leads to a dominant role of population-rich countries. Poland has more than half of the entire population of all new member states and influences the measures heavily. These influences should be kept in mind when interpreting the data.

Employment and Working Conditions

The EU employment guidelines (Council of the EU, 2002) as well as the social policy agenda (European Commission, 2000) designate more and better jobs as an important policy objective. More jobs should reduce unemployment and empower women to participate more on the labor market. The European Commission set a benchmark of a 70% employment rate which countries should aspire to. Better jobs means reducing dangerous and unhealthy working conditions as well as supporting a better balance between work and family life.

Considering the aim of more jobs, employment rates differ markedly between men and women and between the old and new member states. For men in the EU 15, employment rates remain nearly constant at around 72% between 1992 and 2002 with a light interim decrease caused mainly by a 4% decline in employed men in (East-) Germany between 1992 and 1997. In the NMS, the situation is strongly influenced by Poland, where the employment rate of men decreased by ten percentage points since 1997 to 57% in 2002. This leads to an overall shrinking of the average of all NMS from 67% to 62%. In general the distribution between the countries is quite homogenous and the range is around 15% in the EU 15 and 20% in the NMS. However, comparing all 25 EU countries the variance remains relatively low but there is a vast distance between the highest employment rate in the Netherlands (82%) and the lowest in Poland (57%).

Figure 1 illustrates these social cohesion patterns for male employment rates. It summarizes seven measures for each country cluster. The first two are the figures for the maximum and the minimum within a country cluster (❶ ❷), symbolized by the upper and lower cross. The third measure displays the population-weighted mean of the country cluster as the wide line in the center (❸). The fourth and fifth measures explain the variation within the country cluster below and above the mean (❹ ❺). The variation is calculated as the average, population-weighted deviation of all countries which are above/below the cross-country mean. It is displayed as the upper and lower line of the boxes above and below the mean. The sixth and seventh measures indicate the population shares in percent which are below/above the country cluster mean (❻ ❼). This is expressed by the area of the two boxes



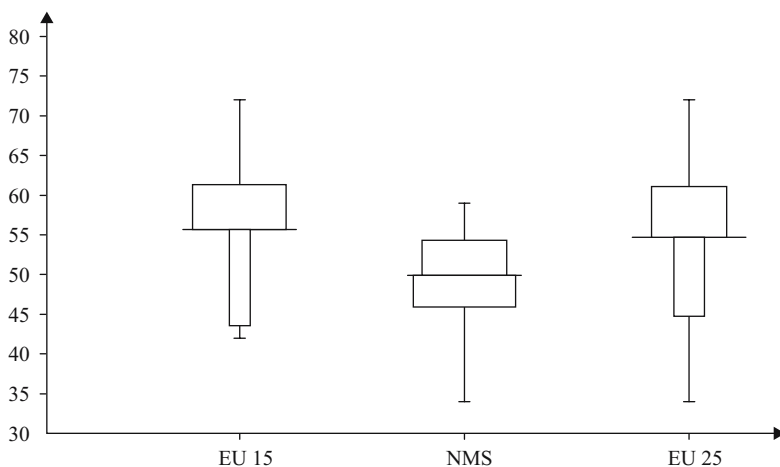
Source: European Foundation: Database on Quality of Life in Europe, data source: Labour Force Survey.

Fig. 1. Employment rates men 2002.

below and above the mean. Population shares can only be compared within country clusters but not between EU 15, NMS and EU 25 because the maximum width is fixed within the chart and depends on the population share and the variation.

The situation is different for women. In the EU 15 there is a constant rise of women's employment during the last 10 years from 50% to 56%. However, the proportion of women's employment rates between the countries did not change much. Greece, Italy and Spain show low employment rates for the whole period and determine the rather huge variance below the mean value. Only the employment rate of women in Ireland rose drastically in one decade from 37% in 1992 to 56% in 2002. The opposite picture can be seen in the NMS. Particularly the former communist countries had high female labor participation, but these figures, which were above the average of the EU 15, have been decreasing constantly during the 1990s and reached around 50% in 2002. But besides the outlier Malta, the situation is more homogenous than in the EU 15. Most of the accession countries cluster together between 45% and 55% (Figure 2).

Again the picture becomes more diverse if the enlarged EU is considered. There is a great gap between Malta, where only 34% of women are employed, and Denmark or Sweden, where over 70% of women have a paid job. Unlike the situation for men, the differences in female employment in the old and new member states are higher. There is an important discrepancy between female labor force participation in the EU 15 and in the NMS. A substantial proportion of female workers in the EU 15 hold part-time contracts, with the exception of the southern European countries. In contrast to many EU 15 countries, almost all women in the former communist countries are employed full-time. In these countries, there is a clear distinction between women who work full-time and women who do not work



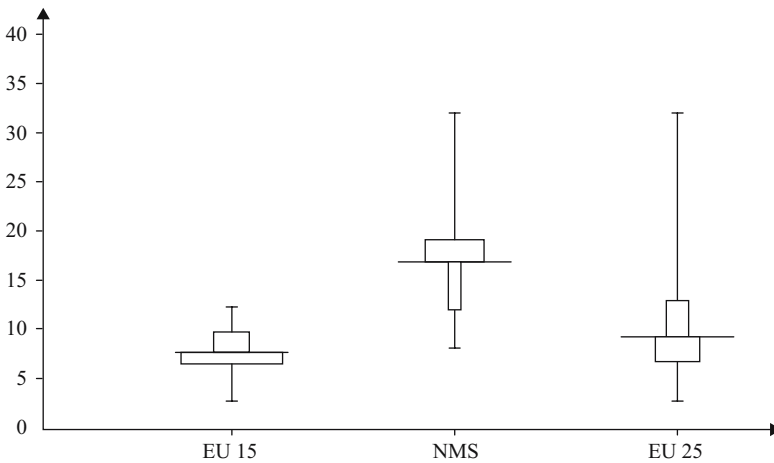
Source: European Foundation: Database on Quality of Life in Europe, data source: Labour Force Survey.

Fig. 2. Employment rates women 2002.

at all (European Foundation, 2004). This offers some potential to increase employment rates by establishing more flexible working time arrangements.

Employment rates differ markedly between the old and the new member states and the difference became even more accentuated during the transformation process in the 1990s, in particular for women. However, for the post-communist countries, there are two factors which indicate good prospects that these countries might catch up in the next years if the economic situation develops positively. First, these countries have formerly (subsidized) full-employment. From the perspective of path dependency, there are no traditional institutional obstacles like in the Mediterranean countries to enhancing labor force participation, although attitudes on gender equality tend to the male breadwinner model (Gerhards and Hölscher, 2003). Second, working time arrangements are rather inelastic, even if the legal frameworks offer more flexibility. If these potentials are utilized, it might improve the employment situation in the NMS and foster social cohesion in the enlarged EU.

Considering subjective indicators, this evaluation is called into doubt. On average more than twice the number of employed persons in the NMS (17%) fears that they might lose their job in the next 6 months than in the EU 15 (8%). Only in Hungary, Malta and Cyprus is the share close to the mean of the old member states, whereas the Baltic States show by far the highest values. In Latvia and Lithuania around every third employee reports that he or she is very or quite likely to lose his/her job in the near future (Figure 3). Astonishingly there is no relation between the fear of losing a job and unemployment rate developments over the past 6 years ($R^2 = 0.04$). However, the concern about job insecurity is correlated with the current unemployment rate of men ($R^2 = 0.58$) and women ($R^2 = 0.50$) but the current labor market situation does not fully reflect negative employment prospects. This



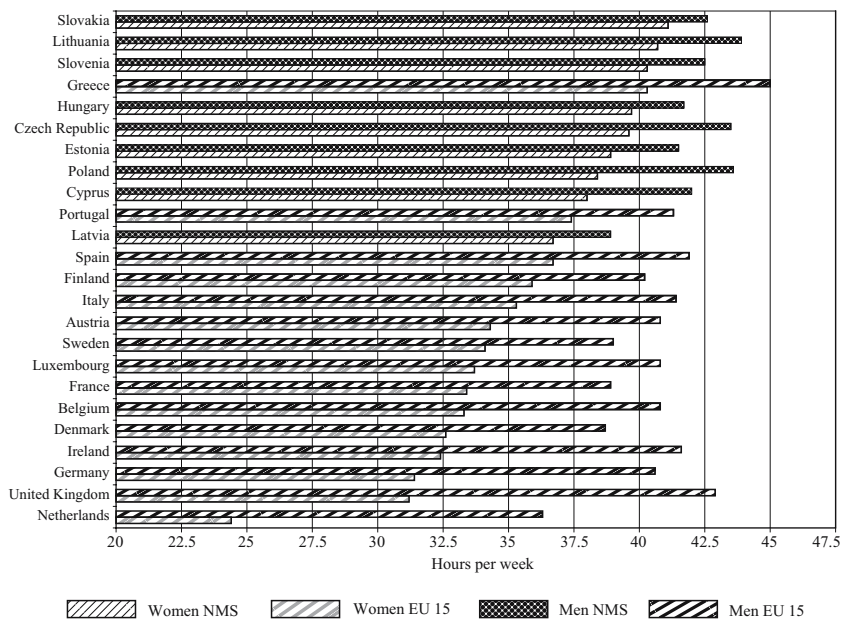
Source: European Foundation: Database on Quality of Life in Europe, data source: European Quality of Life Survey 2003.

Fig. 3. Likelihood to lose job in 2003.

may indicate that transformation is pending. There is still a strong public influence on several economic sectors (agriculture, heavy industry, public sector) with the tendency toward over-employment. Thus, potentials to enhance labor participation are counteracted by workplace cutbacks due to transnational competition and balancing of public expenditures.

Employment is the main way to earn one's living, but employment data gives mainly structural or context information. Although people are employed, job insecurity may hinder them from realizing future plans, for example, family formation, or from investing savings, which affects the quality of life. Furthermore, being employed is a means of forming a personal identity, and the period of employment covers a large part of one's lifetime. Therefore, good working conditions are a key to improving the quality of life.

In almost all countries except Denmark and Lithuania, there are decreasing effective weekly working hours, mainly caused by the growing share of part-time contracts and collective agreements on work time reductions in some countries.³ Although there are notable differences between the countries, on average the deviance between the EU 15 and the NMS is only slightly lower. In the NMS, employees have a longer working week on average. The difference is most substantial for women (Figure 4). In almost all the NMS, women work longer than in the old member states with the largest gap between Slovakia (41 hours) and the Netherlands (24 hours). As mentioned above, this is mainly caused by the lower prevalence of part time contracts in the NMS. In addition the share of employees working extended full time (48 hour a week and more) is for both—men and women—much higher in the NMS. Since 1995, only two countries—Denmark and Lithuania—out of 22 countries had increased working time. However there is no general gender or country-group pattern in the change of working time.



Source: European Foundation: Database on Quality of Life in Europe, data source: Labour Force Survey.

Fig. 4. Weekly working hours by gender by country 2002, sorted by women's working hours.

Working time arrangements are one factor that influences the work-life balance. Not surprisingly, the percentage of people who report difficulties in reconciling work and family responsibilities is higher in most of the NMS than in the EU 15 (European Foundation, 2004b). Working time as an objective measure gives little information about the density of work that might cause stress and affect the quality of work. Hence, subjective assessments of working conditions provide a more detailed picture about the perceived quality of working time arrangements. Table 2 illustrates four indicators on time pressure and time constraints for all EU member states. Two things are striking: First, country deviations are much more distinctive than the division between the old and new member states. Second, indicators on the work-family balance correspond with the longer working hours in the NMS such that long working hours increase the likelihood that people will have more problems in reconciling work and family life. Indicators on work under tight deadlines and stress indicate that a shorter working time in the EU 15 is accompanied by a higher work load.

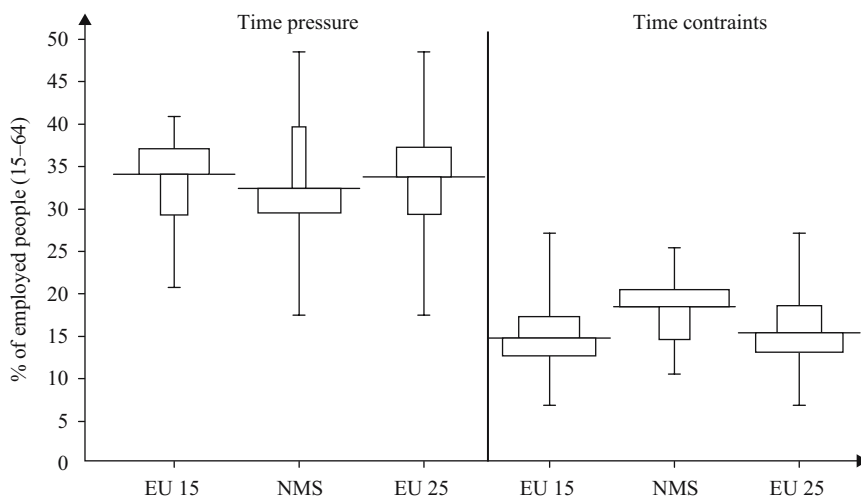
The percentage of people who perceive time pressure and time constraints is heterogeneous across the countries but follows no clear EU 15/NMS distinction. Portugal and Lithuania have on average the lowest population shares, Greece and Hungary the highest. It is hard to get a deeper understanding of these differences

Table 2. Perceived time pressure at work and time constraints because of work.

	Find job stressful		Work under tight deadlines		Partner/family gets fed up with job pressure		Job prevents giving time to family	
	% 2001	Change 1995–2001	% 2001	Change 1995–2001	% 2001	Change 1995–2001	% 2001	Change 1995–2001
Austria	33	-5.6	44	-18.5	7	-10.1	14	-10.9
Belgium	26	-1.1	31	7.0	8	2.2	12	-.2
Denmark	29	.5	29	-1.1	7	-4.7	12	-5.6
Finland	33	.8	41	-2.3	9	-3.1	17	-1.2
France	35	-1.3	37	3.7	11	-3.5	24	-2.7
Germany	31	-3.9	39	.2	11	.0	17	-1.6
Greece	48	-9.6	34	3.5	21	4.2	33	-8.9
Ireland	21	-5.3	42	6.0	7	-1.6	10	-12.0
Italy	37	-3.8	29	8.0	11	3.0	22	1.5
Luxembourg	39	-1.5	30	2.5	9	-6.4	22	-6.2
Netherlands	21	-2.2	35	3.0	6	-.5	9	-3.9
Portugal	25	-9.2	16	-4.8	10	-5.6	13	-13.1
Spain	28	4.0	25	.0	9	-3.5	22	-10.8
Sweden	41	.8	39	3.9	7	-5.5	19	-3.3
United Kingdom	28	-14.5	53	.2	12	-3.7	16	-4.7
Cyprus	46		51		6		17	
Czech Republic	33		48		10		16	
Estonia	31		26		10		24	
Hungary	39		37		15		36	
Latvia	31		25		12		19	
Lithuania	20		15		9		23	
Malta	38		48		6		15	
Poland	37		24		14		24	
Slovakia	33		29		16		20	
Slovenia	32		27		8		16	

Source: European Foundation: Database on Quality of Life in Europe, data source: European Foundation Working Condition Surveys 1995, 2000/2001.

on this macroscopic basis. Flexibility of work-time regulations, accessibility to public social services, the role of family support and the gender differences in the family-work system, different labor productivity and work loads as well as different cultural understandings might foster the country deviations. Regarding the EU 15, there is declining trend in time constraints, whereas perceived time pressure shows no common cross-country pattern.⁴ Italy is the only country where time constraints increase markedly. In all other EU-15 states, a lower share of people report time constraints in reconciling work and family life in 2001 than 6 years before. This is in line with reduced weekly working time and with a range of policy initiatives in the field of work-family balance (see OECD, 2002, 2003).



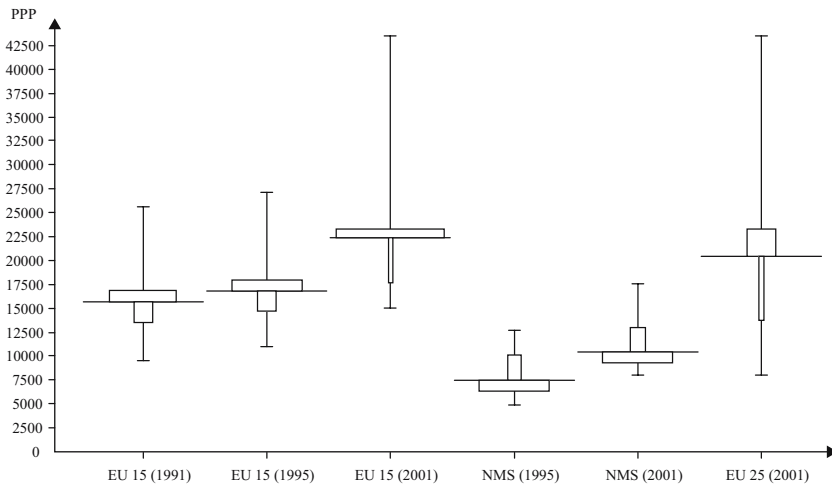
Source: European Foundation: Database on Quality of Life in Europe, data source: European Foundation Working Condition Surveys 2000/2001.

Fig. 5. Share of employed people experiencing time pressure or time constraints.

Figure 5 reveals that the cross-country differences between the 25 EU member states are more marked than the difference between the EU 15 and the NMS. For the indicators on time pressure at work, the variation is higher in the NMS than in the EU 15. A smaller percentage of the population is clearly above the NMS average, with Cyprus ranking at the top (48.5%). Time constraints are more frequent in the NMS. This corresponds to the longer weekly working time in particular for women, which has a clear impact on difficulties reconciling work and family life (European Foundation, 2004b; Webster, 2001).

Standard of Living

The material standard of living plays a key role in subjective well-being, at least when people have difficulties ensuring that their basic needs are met (Delhey, 2003; Fahey and Smyth, 2004). Figure 6 illustrates the different developments in GDP during the 1990s. For the EU 15 member states, there is a substantive increase in GDP per capita after the economically depressed years in the early 1990s. This increase also promoted convergence between most of the member states. Luxembourg on the upper end, with its high increase, is an exception but has little influence on the EU 15 mean because of its small population. Most of the countries cluster very close together within the range of 22,000–25,000 PPS. It is noteworthy that the rank order of the EU 15 has changed significantly. Austria, Denmark, the Netherlands, and in particular Ireland experienced a rapid increase in GDP per capita and overtook most of the former wealthier countries, including Belgium, France and Germany. Otherwise, at the lower end, Greece, Portugal and to some

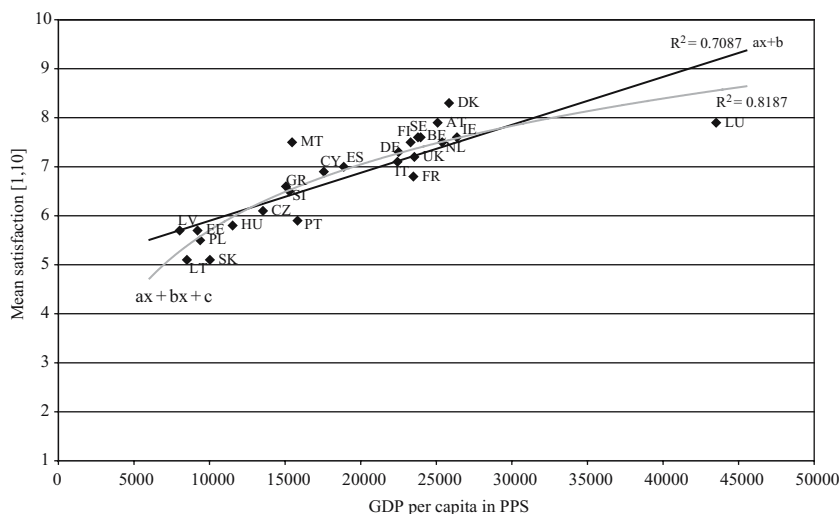


Source: European Commission, Structural Indicators.

Fig. 6. GDP per capita in PPP between 1991 and 2001.

extent Spain cannot follow this rapid pace. Even though GDP per capita grew steadily in these countries, the distance in GDP between the EU 15 mean and these countries increased slightly. Turning to the new member states, the picture is similar to that for the least prosperous countries of the EU 15. After most of the former socialist countries turned around economically in the mid-1990s, when the aftereffects of system breakdown had waned and new markets segments were beginning to develop, GDP per capita also began to increase and continues to do so to this day. But even though growth rates are high in percentages, the absolute distance between the NMS and the EU 15 has increased. The NMS mean is still far lower than the EU 15 minimum held by Greece (2001). In contrast to the EU 15, the rank order within the new member countries did not change much. Malta, Cyprus, and Slovenia have the highest GDP per capita rates, the Baltic States and Poland are still below the threshold of 10,000 PPS per capita. As a consequence, the diversity in GDP increases sharply in the enlarged European Union compared to the former EU 15, with Luxembourg, which has more than twice the GDP per capita, and the Baltic States, which have less than half of the EU 25 average GDP per capita.

GDP is often criticized as uni-dimensional and resource-oriented. But nevertheless GDP per capita is—on a macro level—a good predictor for subjective perceptions of well-being measured by satisfaction with standard of living or general life satisfaction (Fahey and Smyth, 2004). Figure 7 shows that the mean satisfaction with standard of living is highly correlated with GDP per capita. There is a clear increase of satisfaction moving from the lower GDP level to higher levels. However, within the EU 15 and the NMS there is a more heterogeneous cluster which does not strictly follow the linear or curve-linear trends. Beside the methodological problem that the satisfaction scale has an upper bound and therefore cannot represent a linear trend, the results indicate that there seem to be a saturation effect. The lower the level



Source: European Commission, Structural Indicators; European Foundation: Database on Quality of Life in Europe, date source: European Quality of Life Survey 2003.

Fig. 7. GDP and satisfaction with standard of living (period 2001–2003).

of wealth at the outset, the more the same absolute increase of wealth will improve the satisfaction with standard of living.

Macro indicators on wealth, subjectively or objectively defined, reveal little on the distribution of wealth within nations. Not surprisingly there are only weak relations between GDP per capita and measures of income inequality like the GINI-index ($R^2 = 0.15$) or the ratio between the median household equivalence income between the lower and upper quintile ($R^2 = 0.00$). In this respect, measures on poverty and deprivation give more detailed information about the prevalence of precarious living conditions in a country. There is a long and continuing debate as to how to assess poverty and deprivation adequately. In industrialized countries, relative poverty measures that compare the standard of living of an individual in relation to a national or regional average are used most often. Relative measures which are frequently reported by the EU Commission show no distinct differences in the percentage of people who live under the relative poverty line in the EU 15 compared to the NMS. Portugal, Ireland, Greece and the United Kingdom have even higher poverty rates than most of the NMS (see Table 3).

As expected, this situation changes drastically when applying subjective indicators that are in some sense absolute measure. Figure 8 shows the linear regression lines between four indicators on economic strain and GDP per capita. In contrast to the above-mentioned relative poverty line, subjective assessment of economic strain is much more strongly correlated to GDP per capita. This indicates that large population shares in the economic less-well-off EU member states, and particularly in the Baltic States and Poland, face precarious living conditions and a lack of income resources to make ends meet.

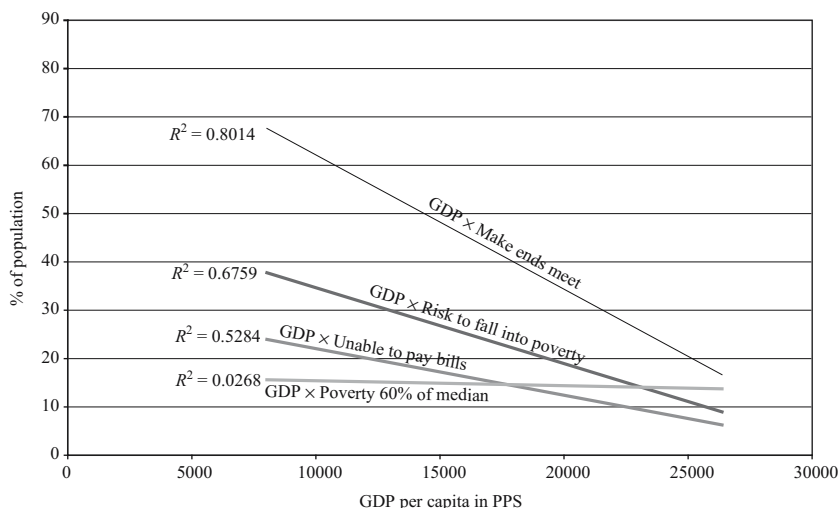
Table 3. Indicators on deprivation and economic strain (period 2001–2003).

Country	GDP Per Capita PPS	At risk of poverty rate (60% median) %	Perceived risk to fall into poverty %	Difficulties making ends meet %	Unable to pay utility bills %	Satisfaction with standard of living Mean [1,10]
Austria	25,090	12	13	18	4	7.9
Belgium	23,960	13	10	28	9	7.6
Denmark	25,840	11	13	16	3	8.3
Finland	23,300	11	16	21	11	7.5
France	23,480	16	11	38	12	6.8
Germany	22,510	10	18	23	6	7.3
Greece	15,050	20	27	59	24	6.6
Ireland	26,370	20	19	20	13	7.6
Italy	22,430	18	12	24	22	7.1
Luxembourg	43,510	12	6	15	6	7.9
Netherlands	25,390	10	8	27	7	7.5
Portugal	15,820	21	29	37	12	5.9
Spain	18,880	18	12	44	6	7.0
Sweden	23,790	11	15	18	6	7.6
United Kingdom	23,550	19	21	23	14	7.2
Cyprus	17,560	–	18	50	15	6.9
Czech Republic	13,530	8	30	47	8	6.1
Estonia	9200	18	41	64	25	5.7
Hungary	11,530	9	27	63	20	5.8
Latvia	8029	16	37	71	33	5.7
Lithuania	8500	17	51	82	24	5.1
Malta	15,460	15	11	21	9	7.5
Poland	9380	16	35	64	32	5.5
Slovakia	10,020	–	43	54	18	5.1
Slovenia	15,280	11	12	41	11	6.5

Source: European Commission, Structural Indicators; European Foundation, Database on Quality of Life in Europe, data source: *Eurobarometer*; *European Quality of Life Survey*.

Promoting social cohesion by lowering inequalities within nations taking a national reference like the 60% of median household income poverty line gives an incomplete illustration of the degree of deprivation in the EU member states as Figure 8 above pinpoints. In addition to the national reference levels, there have to be further measures that use standards oriented toward an EU-wide reference level or an absolute or a EU-wide relative scale. Subjective measures—although they are sensible for interpretation and to some extent fuzzy—provide a more comprehensive insight in the difference of living conditions of Europeans.

In seven out of ten NMS countries, more than half of the population reports that they have great difficulties or difficulties making ends meet, whereas in the EU



Source: European Commission, Structural Indicators; European Foundation, Database on Quality of Life in Europe, data source: Eurobarometer, European Quality of Life Survey.

Fig. 8. GDP per capita by indicators on economic strain (period 2001–2003)*.

*24 EU countries, Luxembourg is excluded as an outlier.

15 only Greece has such a high population share with 59%. In five out of ten NMS countries, more than every third person perceives a risk that he or she could fall into poverty, whereas in the EU 15 only Portugal (29%) and Greece (27%) comes close to these figures. The same picture emerges for the percentage of people who are not able to pay utility bills on time. In five out of ten NMS countries, more than 20% of the population reports such difficulties; in the EU 15 only Italy (22%) and again Greece (24%) show such high rates. With the NMS Malta and to some extent Cyprus, the Czech Republic and Slovenia have low rates of perceived economic strain. In contrast, in the Baltic States and Poland, huge shares of the population report that they have difficulties meeting their basic needs. In the EU 15, only in Greece do people perceive these problems in a similar way. In all other countries, the population shares which report economic strains are significantly lower than in the NMS. In Austria, Denmark, Luxembourg and Sweden, a lack of income or resources is only perceived by a quite a small part of the population (see Table 3).

The New Formation of the European Union

The former analysis illustrates that with EU enlargement, cross-national diversity will rise and the policy aim of social cohesion will be much more challenging in an EU with 25 members. Comparisons between the old and the new EU member states are rational in that they refer to a historical process of economic, social and political integration of an enlarged European Union. But from an analytical point of view, the

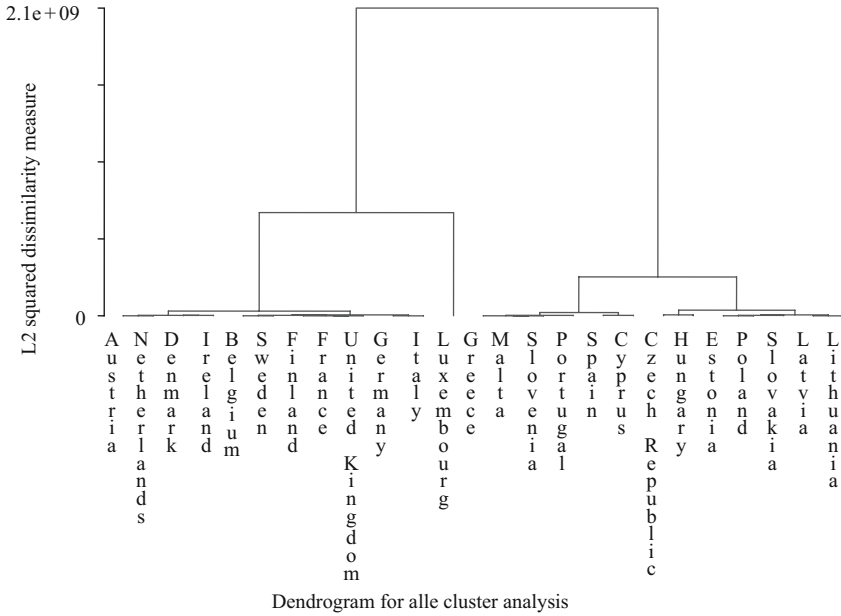
comparison between the old and new member states conceals similarities between countries that are related to structural conditions and that run counter to the concept of comparing the former member states with the new ones.

Hence, culturally and historically, Malta and Cyprus have more in common with Italy and Greece than with the remaining accession countries with its former socialistic systems. Within the post-communist countries there is a wide range of diversity, too. The situation of the Baltic States, which were part of the Soviet Union for 50 years, is very different compared to Slovenia, which was part of the former Yugoslavia and is now one of the most liberal and prosperous regions of the former Eastern Bloc and was only barely affected by the Balkan conflict in the 1990s. But the situation in the new member states is quite heterogeneous not only in historical terms, but also in structural terms. The former Czechoslovakia was subdivided into the Czech Republic, with its core industrial regions and Prague as its prosperous capital, and Slovakia, with its low degree of industrialization and urbanization except for the Bratislava region.

Taking these historical and structural commonalities into account, it might foster the understanding of developments in the enlarged EU if the frame is shifted from the dichotomy between old and new member states to the relatedness within country clusters among countries that share similar conditions and historical roots. Figure 9 presents the cluster analysis of the set of indicators which are used to describe social cohesion in the field of employment and working conditions as well as for economic resources and economic strain. The results are in line with analysis, which covers a wider scope of life domains (see European Foundation, 2004b) and reflect the national distribution of general measures on well-being, for example, life satisfaction and happiness.

The most striking result is that there are three country clusters that do not consistently reflect the division between old and new member states. The first cluster combines the old northern European member states. Luxembourg is, in this respect, an outlier because of its high standard of living, low unemployment rates and good health and working conditions. Nonetheless, Luxembourg is much more strongly related to the first country cluster than to the remaining ones. The second group comprises the Mediterranean countries Greece, Malta, Slovenia, Portugal, Spain and Cyprus. This intermediary group contains the most well-off accession countries and the old member with a lower living standard. The third group consists of new member states that were former post-communist countries (except Slovenia). Within this group there is the division between the Czech Republic and Hungary on the one hand and the Baltic States, Poland and Slovakia and the other, which reflects economic disparities in this country cluster (see also European Commission, 2004, p. 11).

Comparing the dissimilarity measure, the clear gap between the first cluster, including Luxembourg, and the two other country clusters is striking. It marks a dividing line for social inequalities in the enlarged EU. This might point to serious challenges for further integration processes. On the one hand it could be argued that there are countries in the less well-off clusters that have been EU member states for 18 years or more and have not yet endangered the stability or integrity of the EU; even Greece, Portugal and Spain are members of the monetary union.



Source: European Foundation, Database on Quality of Life in Europe, European Commission, Structural indicators. Indicators used: GDP, Poverty rate (60% median), risk to fall into poverty, difficulties to make ends meet, unable to pay scheduled bills, satisfaction with standard of living, male employment rate, female employment rate, likelihood to lose the job, time pressure, and time constraints.

Fig. 9. Cluster analyses: period: 2000–2003, wards method.

Moreover, the example of Ireland demonstrates that a country has the opportunity to overcome the gaps in living standards, and can move into the more prosperous country cluster. Hence, this great divide between the clusters is not a clear borderline, although it takes time to catch up with the situation of the richer countries (see Borschier, 2000). On the other hand one might argue that although Greece, Portugal and Spain have been EU member states for a long time and made some progress in improving the social situation of the citizens, they still lag behind the EU 15 average in many respects. This may indicate that long-lasting structural conditions like low female employment rates are persistent and slow down modernization processes. Similar structural conditions could be found in the two new Mediterranean member states Cyprus and Malta. The post-communist countries have a very different heritage. They are still in the process of transformation (Deacon, 2000). From an institutional perspective, this transformation has made fast progress, fostered by the guidelines of the Copenhagen criteria and the influence of the World Bank in the 1990s (Manning, 2004). However, a generational gap remains between the elderly, who have to deal with the rapid social changes and severe breaks in their life biography, and the young, who are more optimistic and make great efforts to handle the difficulties and insecurity associated with new freedoms. Last but not least, the dividing line between poor and rich countries

might be constant because the ratio of poor to rich countries changed significantly with EU enlargement, and because of the limited means of support due to fixed national budgets and the need to avoid debt. The question is whether the enlarged EU is capable of giving the necessary support to the new member states.

Resume: New Challenges to Promote Social Cohesion

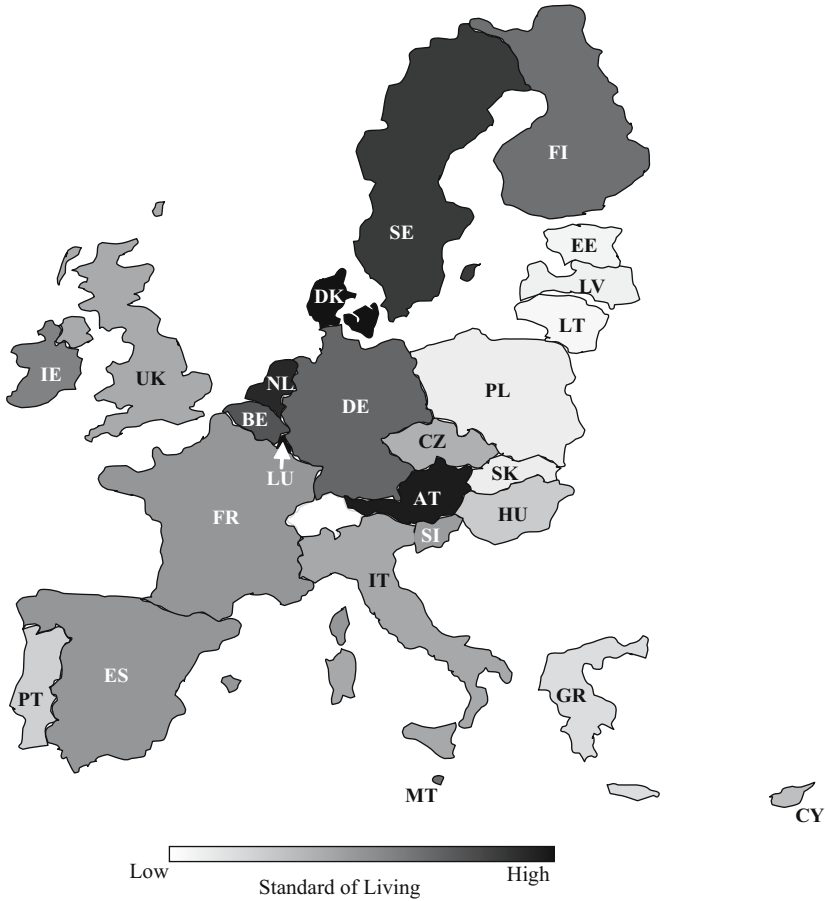
With the 2004 EU enlargement incorporating ten new member states and the application of three further candidate countries to become members in the future, the EU faces substantial challenges. The Community become more diverse in cultural terms and comprises a much wider span of levels of living. Eight of the ten new member states are former communist countries which face enormous social and economic changes with the transition phase in the 1990s. Thus social cohesion is becoming increasingly important to deal with two overlapping phenomena in the enlarged EU: national transitions and global transitions.

The analysis here has revealed that the EU 15 countries are converging in terms of living standards and employment conditions and that the situation has improved in all countries for the most of the reported indicators. With the enlargement to include ten new member states, the situation becomes more diverse. All new member states have a lower standard of living than the EU 15 average; in both objectively and subjectively defined terms. However, the analysis shows that empirically, it makes more sense to move away from the old and new member states distinction and describe the social situation in the enlarged EU by three emerging country clusters. Great efforts have to be made in particular for the post-communist countries, which almost all stick together in the third, least well off cluster. This attempt to improve the situation might be of special relevance because of the regional gradients which arise between the nations. The differences in the standard of living between Finland and Estonia; Germany and Poland; Austria and Slovakia and Hungary are huge (Figure 10). Regional disparities are one important frame of reference to evaluate the individual life situation and to identify inequalities that might lead to discontent with the current situation. Thus from a policy point of view, one has to be aware that there is a difference in seeing social disparities, for example between Portugal and Germany compared to neighboring countries Poland and Germany, which have an impact on migration decisions and social and economic competition and might weaken social cohesion in this regions.

Although the former communist countries are less well-off, there are some structural conditions and developments which give them good prospect of catching up in the long run.

First, labor force participation is not historically low, which means that there are no traditional barriers to increase labor force participation like exist in many of the southern European member states. Part-time contracts are fairly rare. There are more options for restructuring the employment sector—presuming economic growth—than in many of the old EU member states. Second, the share of population with high educational attainment in the post-communist countries is as high as in the northern EU 15 states. High education levels are a key precondition to build up a knowledge-based society. Third, there is the chance to modernize at a fast rate

Disparities in Standard of Living in the EU



Rank index with following indicators: GDP, Poverty rate (60% median), risk to fall into poverty, difficulties to make ends meet, unable to pay scheduled bills, satisfaction with standard of living.

Fig. 10. Disparities in standard of living in the EU.

of speed. The introduction of new technologies does not have to follow a protracted step-by-step implementation process but can instead be carried out in one step by renewing the social infrastructure. And last but not least with the EU membership these countries might benefit from a better market access and subsidies from structural funds. There is of course a lot of skepticism and general improvements of the living conditions may not conceal that in some areas, like the agricultural sector or in the heavy industry, there will be enormous structural changes in the next year which affect the life circumstances of many people in the new member states negatively.

Notes

1. The notion of social cohesion has no distinct and broadly accepted definition (Jenson, 1998, p. 4). In most of the standard encyclopedias, “social cohesion” does not appear at all. And the term cohesion itself refers to a rather vague concept of integrity of a social entity. Historical roots date back to the work of Émile Durkheim. For him, cohesion as an outcome of the different forms of solidarity is a core factor in creating social order and clarifying what makes it possible for people live together peacefully in a society [Durkheim, 1995 (orig. 1912); Jones, 1986].
2. The term “objective” might be misleading because although it implies tangible facts that can be formally employed, it is often based on individual criteria and is to some extent open to the interpretation of the respondent.
3. For Cyprus, Malta and Poland no data on working hours is available for 1995. Therefore, these countries are not included in the comparison.
4. Unfortunately, there are no time series available for the new EU member states.

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Promoting Well-Being: A British Perspective¹

BEVERLEY A. SEARLE

Introduction

Initial definitions of well-being have tended to focus on the psychological consequences of ill-health or economic deprivation, in particular the negative impact of life events, change, and poverty. Whilst steps have been made towards understanding individual well-being in terms more than the psychological consequences of health and economic circumstances, there is still a tendency to focus on the negative aspects.

In order to bring about an improvement in the well-being of society, however, we need to understand not only the circumstances of those with poor well-being, but also the circumstances through which good well-being is experienced. This chapter reports on the findings from empirical research which aims to address this issue by providing new knowledge on factors associated with positive well-being among the adult population of Great Britain. This research will show that improvements in life satisfaction, health, and social integration are positively associated with improved well-being, whilst deterioration in health has a negative association. The findings also question the relationship between affluence and well-being where it is shown to be negatively related to improved well-being states.

Definitions of Well-Being

Initial definitions of well-being have emerged through psychological and economic theory. Psychological well-being concentrated on the impact of life events on individual's mental health status (Meyer, 1951; Holmes and Rahe, 1967), the principal theory being that change per se is stressful in that it demands adaptation to existing routines. This assumption has been criticised, however, and it has been suggested that life events or the occurrence of change, in themselves are not necessarily the source of stress, but experienced stress levels are relative to individual's perceptions of (Pearlin and Schooler, 1978), and emotional attachment assigned to (Hinkle, 1974) specific events.

Although studies on the effect of change and life events have focused on well-being as a by-product of psychological malaise following exposure to stressful circumstances, these studies have served to expand the understanding of well-being through addressing the relationship between environmental circumstances and their manifestation into biological states. Although directionality may be spurious, such research enables progress in the identification of factors which may be associated with a positive state of well-being.

Economic conceptualisations of well-being emerged within a capitalist paradigm with a dominance towards western ideology in “achieving” rather than “being.” Increased spending power was equated to increased satisfaction (Scitovsky, 1976) with national (or even individual) well-being expressed in terms of “utility” or GDP per capita (Nussbaum and Sen, 1993). However, the failure of well-being to rise in accordance with economic growth (Reeves, 2002a) has meant the fundamental principles of economic theory are being called into question. Criticism of economic theory and the dominance of economic measures as being indicators of well-being gave rise to the social indicators movement within which the conceptualisation of well-being expanded. Based on Maslow’s (1954) motivation theory, conceptualisations of well-being developed to not only address external circumstances, but also individuals’ desires and needs and their perceptions of their surroundings. Studies began to show that subjective assessment of circumstances was more important to quality of life than objective conditions (Campbell *et al.*, 1976) and definitions of well-being become synonymous with satisfaction levels in particular satisfaction with life overall (Andrews and Withey, 1976).

Measuring Improved Well-Being

This chapter contributes to the growing literature on subjective well-being. It reports the findings of empirical research on the relationship between improved well-being and changes in circumstances, using data from the British Household Panel Survey (BHPS) from 1994 to 1999. The BHPS was designed as a nationally representative sample in 1991 of approximately 10,000 individuals. For the research reported here the total sample size ranged between 9481 in 1994 and 9101 in 1999. The BHPS is a time series dataset, using the same individuals. It represents the single most comprehensive UK social survey including questions on objective and subjective elements of social, economic, and environmental circumstances at the individual and household level. The research focuses on adults aged 25 years and over.

Drawing upon evidence from previous research the process through which well-being occurs has been conceptualised as an outcome measure of an individual’s life experiences and circumstances which together manifest themselves into an overall psychological state of mind. It has been measured using the short form 12 General Health Questionnaire (GHQ12) (Goldberg, 1972). This measure was devised in response to limitations of previous psychological measures which tended to focus on subgroups at the extremes of society² and tended to be retrospective in nature.³ Goldberg (1972), however, recognised a need to address the potential occurrence of psychological distress within the community. Since its

introduction in the 1970s the GHQ has been widely validated (e.g., see Goldberg *et al.*, 1997; Walters *et al.*, 2001; Smith and Borland, 1999). It has become one of the most widely used measures of quality of life (Hemingway *et al.*, 1997) and has been describe as “possibly the best instrument to measure psychological distress of its kind” (Goodchild and Duncan-Jones, 1985, p. 59).

The GHQ12 measures aspects of both pleasant and unpleasant emotions which have been identified as elements of well-being (Diener *et al.*, 2003) and through addressing different aspects of stress and ability to cope with everyday life events, it contains factors typical of those used in studies assessing the psychological health element of well-being (Kahn and Juster, 2002). It is used to detect those with low levels of well-being, and the summed GHQ12 scores in the BHPS use a negative scale running from 0 (least distressed) to 36 (most distressed). However, as the aim of this research is to identify factors associated with a positive state of well-being, as an analytical aid this traditional measure has been adapted and the summed scores have been reversed, so that an increased score is indicative of increased well-being.

Although widely validated, there is still discretion over the optimum threshold to apply to GHQ12 scores in determining casesness (Donath, 2001). Previous research shows variations in thresholds, which have been accounted for in respect of cultural and methodological differences (Goldberg *et al.*, 1998; Donath, 2001). However, Goldberg and colleagues (1998) concluded that generally the mean GHQ score for the population of respondents provides the best threshold guide. When deciding on cut-off points there are three main issues that need to be addressed; validity, reliability, and generalisability. The “choice of cut-off points is bound to be arbitrary and will have a direct impact on the results obtained” suggesting that it may be better to use more than one method or employ a systematic procedure (like quartiles) as a means of collapsing cases (Bryman and Cramer, 1994, p. 178). In response to these needs several methods were explored to divide the sample into reasonably valid and reliable categorisations to identify those with high and low well-being. Three main factors were considered in deciding the final cut-off points. Firstly, average well-being scores remained constant at point 25 for each year between 1994 and 1999. Secondly, identifying scores where 50% of the questions were answered as “better than usual” and 50% as “same as usual” was considered as an indication of experiencing high levels of well-being, and produced a minimum score of 30. Answering “worse than usual” for 50% and “same as usual” for 50% was considered representative of low levels of well-being, and produced a maximum score of 18. Thirdly, less than 10% of the sample scored 18 or less, or scored 30 or more, increasing the samples to 20% resulted in cut-off points of 22 and 28. These methods are not exhaustive but were considered as providing a reasonable variation in terms of addressing the three main issues of validity, reliability, and generalisability. Of the options available it was considered that divisions based on the top and bottom 20% would provide the best representation for high and low well-being for this research.

Analysing change across each of the six years initially proved too complex and in order to make the data manageable, it was collapsed into two time periods of 1994–1996 and 1997–1999. The three annual subjective well-being scores in each period were summed and individuals were assigned as having high well-being if

Table 1. Independent variables by themes.

Theme	Variables in regression
Demographic	<i>Age</i> ^a <i>Ethnicity</i> ^a Household Type
Socioeconomic	<i>Household income after housing costs</i> ^c Self-perceived financial situation <i>Employment status</i> ^b Employment commitment (full or part-time) Employment security (permanent or temporary) Social Class Housing Tenure <i>Education qualification</i> ^c
Social	Marital status Childcare responsibilities <i>Social Support</i> ^a Times of day worked Number of hours in paid work Number of hours on housework Participation in local groups Political interest Religious activity
Spatial	Region Local Authority Area Classification Neighbourhood Problems Neighbourhood Resources (suitability of area for raising children, standard of schools, medical, transport, shopping, <i>leisure</i> ^c)
Health	Registered disabled <i>Number of health problems</i> ^c <i>Self-reported health status</i> ^a <i>Health functioning (health limits daily activity)</i> ^a Leisure activity Smoking behaviour
Domain satisfaction	Satisfaction with: <i>Health</i> ^a <i>Income</i> ^c Accommodation Spouse/partner <i>Work</i> ^b Social life <i>Amount of Leisure time</i> ^c <i>Use of Leisure time</i> ^b <i>Life overall</i> ^a

^a Variables were significantly associated with improved well-being for men and women.

^b Variables were significantly associated with improved well-being for men only.

^c Variables were significantly associated with improved well-being for women only.

they scored 85 or more on a scale from 0 (low well-being) to 108 (high well-being) and as having low well-being if they scored 65 or less (and for the purpose of clarity the remainder were labelled as “moderate” well-being). Based on this division, the research reported here addresses a gap in current knowledge through exploring the circumstances under which well-being could be promoted by looking at those whose well-being improved from the low or moderate level in 1994–1996 to the high level in 1997–1999.

Using logistic regression the research was conducted in two phases. Firstly, individual models were developed to assess the importance of variables within six themes (Table 1).⁴ In the second phase only those variables which were significantly associated with improved well-being in phase one were used (shown in italics in Table 1). Three separate models were compiled in the second phase. The first model contains all the variables. In the second model the domain satisfaction variables have been excluded. This is to test previous research findings (Campbell *et al.*, 1976) which suggest that subjective measures (in particular satisfaction with life overall (Andrews and Withey, 1976)) account for a greater variation in quality of life than objective measures. A third model was compiled which excluded the domain satisfaction and self-reported health status. Age and ethnicity were also included in all the models as control factors.⁵

Factors Associated with Improved Well-Being

The results of the analysis are presented in Table 2 for women and Table 3 for men. The findings show that subjective assessment of life circumstances appear to be the most important factors in explaining variations in improved well-being. When all the variables in the model are controlled for satisfaction with health (Δ LLR 32.1), life overall (Δ LLR 18.9), amount of leisure time (Δ LLR 15.6), and income (Δ LLR 10.0) all become important variables for women (Table 2: Model 1). Among men they were satisfaction with work (Δ LLR 29.8), health (Δ LLR 14.5), life overall (Δ LLR 11.4), and use of leisure time (Δ LLR 9.2) (Table 3: Model 1). Where individual's satisfaction levels have increased within specific domains then this was associated with improvements in well-being. For example, higher odds were associated with women who were satisfied or became satisfied with their health (3.6 to 4.0, respectively; $p < .001$), and with men who become satisfied with work (3.2; $p < .001$).

Previous research has suggested that economic resources are not a good measure of subjective well-being (Clarke and Islam, 2002; Layard, 2003, 2005) and despite a 15% rise in economic growth in Britain during the late 1990s, average life satisfaction has apparently not risen at all (Reeves, 2002a).

Within the research reported here, when the relationship between income and well-being is assessed independently, among women being in the top income quintile was associated with higher odds of improved well-being (1.8; $p < .05$) (see the bivariate results in Table 2). However, when other variables are controlled for this relationship is not significant and affluence has a negative relationship with

Table 2. Factors associated with improved subjective well-being: Females 1996–1999.

Total <i>n</i> (Become high well-being <i>n</i>)		2790 (248)	2835 (251)	2835 (251)
Variable	Odds bivariate analysis	Adjusted odds: Regression analysis		
		Model 1	Model 2 ^a	Model 3 ^b
<i>Satisfaction with health</i>				
	***	***ΔLLR 32.1	N/A	N/A
Not satisfied	1.0	1.0		
Satisfied to not satisfied	1.5	1.8		
Not satisfied to satisfied	4.9***	4.0***		
Satisfied	4.9***	3.6***		
<i>Satisfaction with life overall</i>				
	***	***ΔLLR 18.9	N/A	N/A
Not satisfied	1.0	1.0		
Satisfied to not satisfied	1.3	1.4		
Not satisfied to satisfied	7.6***	4.4**		
Satisfied	6.7***	3.7**		
<i>Self-reported health status</i>				
	***		***ΔLLR 39.7	N/A
Poor	1.0		1.0	
Become poor	.8		1.4	
Poor to fair	2.0		3.3	
Fair	1.7		2.3	
Good to fair	3.4		5.3	
Become good	5.5*		7.6*	
Good	5.1*		7.2	
<i>Hh income after housing costs</i>				
	**	**ΔLLR 17.0	***ΔLLR 20.5	***ΔLLR 21.5
Bottom quintile	1.0	1.0	1.0	1.0
2 nd	.8	.6	.7	.7
3 rd	.9	.7	.8	.8
4 th	.5	.4*	.5*	.5*
Top quintile	1.8*	1.2	1.5	1.5
Increase quintile(s)	1.4	1.1	1.3	1.3
Decrease quintile(s)	1.0	.9	1.0	1.0
<i>Satisfaction with amount of leisure time</i>				
	***	**ΔLLR 15.6	N/A	N/A
Not satisfied	1.0	1.0		
Satisfied to not satisfied	1.4	1.2		
Not satisfied to satisfied	3.4***	2.2***		
Satisfied	2.0***	1.2		
<i>Satisfaction with income</i>				
	***	*ΔLLR 10.0	N/A	N/A
Not satisfied	1.0	1.0		
Satisfied to not satisfied	.8	.7		
Not satisfied to satisfied	2.8***	1.6*		
Satisfied	2.4***	1.3		
<i>Health limits daily activity</i>				
	***		N/A	***ΔLLR 20.8
Yes	.3***			.4*
Started to limit	.3**			.3*
Stopped limiting	1.2			1.3
No	1.0			1.0
<i>Social Support</i>				
	**			*ΔLLR 9.8
None/poor/reduced support	1.0			1.0
Improved support	.7			.9

Variable	Odds bivariate analysis	Adjusted odds: Regression analysis		
		Model 1	Model 2 ^a	Model 3 ^b
Total <i>n</i> (Become high well-being <i>n</i>)		2790 (248)	2835 (251)	2835 (251)
Moderate support	.4			.5
Good support	1.8*			1.7*
<i>Education</i>	*			
Higher qualifications	1.3			
A Levels	1.3			
O Levels	1.7**			
Lower qualifications	1.0			
Increased qualifications	1.8*			
None	1.0			
Suitability of leisure facilities				
Good	1.3*			
Poor	1.0			
Number of health problems	**			
None	1.0			
1	0.9			
2	1.1			
3 or more	.3*			
Gain problems	.6*			
Lose problems	.7			
Increase no of problems	.4***			
Decrease no of problems	.8			
Age	**			
25–34	1.6***			
35–44	1.1			
45–54	1.0			
55–64	1.0			
65–74	.8			
75+	.6*			
Ethnicity				
White	1.0			
Ethnic-Minority	1.0			

^a Excluding domain satisfaction variables.

^b Excluding domain satisfaction variables and self-reported health status.

improved well-being. Even when domain satisfaction and health status variables are removed from the analysis, although income is the most important variable among women, the relationship between top income quintile and well-being is not significant and women in the fourth quintile had significantly lower odds of their well-being improving (.4; $p < .05$) (Table 2: Model 1).

The findings however would suggest that some improvements in socio-economic conditions may be important in respect of promoting well-being. Employment status was the most important variable in explaining variations in well-being when the domain satisfaction variables were removed from the model for men (Table 3:

Table 3. Factors associated with improved subjective well-being: Males 1996–1999.

Total <i>n</i> (Become High well-being <i>n</i>)		2423 (263)	2509 (269)	2512 (269)
Variable	Odds bivariate analysis	Adjusted odds: Regression analysis		
		Model 1	Model 2 ^a	Model 3 ^b
Satisfaction with work	***	*** Δ LLR 29.8	N/A	N/A
N/A	1.0	1.0		
Become N/A	1.0	.9		
N/A to not satisfied	1.7	2.1		
Not satisfied	.5*	.6		
Satisfied to not satisfied	.4*	.5		
N/A to satisfied	3.7***	3.2***		
Not satisfied to satisfied	1.9**	1.6		
Satisfied	1.6**	1.2		
<i>Satisfaction with Health</i>	***	** Δ LLR 14.5	N/A	N/A
Not satisfied	1.0	1.0		
Satisfied to not satisfied	.8	.7		
Not satisfied to satisfied	3.3***	2.1*		
Satisfied	3.2***	1.7		
<i>Employment Status</i>	*		** Δ LLR 31.8	** Δ LLR 39.3
Employed	1.0		1.0	1.0
Unemployed	.002		.002	.002
Retired	.8		1.0	.9
Family care	.002		.002	.002
Student	1.3		1.4	1.3
Long term sick/disabled	.3*		.8	.4
Become employed	2.5***		2.9***	2.6***
Become unemployed	.7		.8	.7
Become retired	1.3		1.4	1.2
Become family care	2.7		2.8	2.9
Become student	.002		.003	.002
Become long-term sick/disabled	.002		.004	.002
<i>Self-reported Health Status</i>	**		*** Δ LLR 25.8	N/A
Poor	1.0		1.0	
Become Poor	1.8		2.2	
Poor to Fair	.03		.01	
Fair	3.5		3.3	
Good to fair	4.3		4.3	
Become good	6.3*		5.8*	
Good	5.2*		5.0*	
<i>Social support</i>	**	* Δ LLR 11.4	** Δ LLR 15.9	** Δ LLR 15.9
No/poor/reduced support	1.0	1.0	1.0	1.0
Improved support	2.4**	2.2*	2.4**	2.4**
Moderate support	2.9*	3.8**	3.1*	2.8*
Good support	2.2**	1.7*	2.1**	2.1**
<i>Satisfaction with Life overall</i>	***	** Δ LLR 11.4	N/A	N/A
Not satisfied	1.0	1.0		
Satisfied to not satisfied	.9	.9		

Total <i>n</i> (Become High well-being <i>n</i>)		2423 (263)	2509 (269)	2512 (269)
Variable	Odds bivariate analysis	Adjusted odds: Regression analysis		
		Model 1	Model 2 ^a	Model 3 ^b
Not satisfied to satisfied	5.7***	2.6*		
Satisfied	6.0***	2.6*		
<i>Satisfaction with use of leisure time</i>	***	* Δ LLR 9.2	N/A	N/A
Not satisfied	1.0	1.0		
Satisfied to not satisfied	1.3	1.1		
Not satisfied to satisfied	3.0***	1.7		
Satisfied	3.3***	1.8*		
Health limits daily activity	*			
Yes	.6*			
Start to limit	.4*			
Stopped limiting	1.3			
No	1.0			
Age				
25–34	1.1			
35–44	.9			
45–54	1.2			
55–64	.9			
65–74	1.3			
75+	.8			
Ethnicity				
White	1.0			
Ethnic-Minority	.9			

^a Excluding domain satisfaction variables.

^b Excluding domain satisfaction variables and self-reported health status.

Model 2), with those who became employed being 2.9 ($p < .001$) times more likely to experience improved well-being. Such findings support previous research which generally shows a positive relationship between employment and life satisfaction (Blanchflower and Oswald, 2002; Inglehart, 1990). Increased satisfaction with work amongst men and increased satisfaction with income amongst women, also suggest that economic factors are important considerations in understanding improvements in well-being.

Health generally was also important in explaining variations in changes in well-being. For example, when the domain satisfaction variables were removed from the analysis self-reported health status became the most important variable for women (Δ LLR 39.7) (Table 2: Model 2) and the second most important variable for men (Δ LLR 25.8) (Table 3: Model 2). When self-reported health status is removed from the analysis, health functioning (Δ LLR 20.8) was the second most

important variable for women (Table 2: Model 3). Previous research suggests that health emerges as an important factor in understanding well-being when its deterioration interferes with daily functioning (Argyle, 1987; Campbell *et al.*, 1976) and this research shows that loss of health functioning (0.3–0.4; $p < .05$) or being on long-term sick/disabled (.3; $p < .05$) is associated with lower odds of well-being improving. However, in contradiction to such theory the findings also show that where people perceive their health as having improved (5.8 for men and 7.6 for women; $p < .05$), or their satisfaction with their health has increased (2.1 for men and 4.0 for women; $p < .01$) then this is more likely to be associated with improvements in their well-being.

Promoting well-being, among women, may also be linked with education and the motivation towards self-fulfilment. Women who had become students had an increased probability of well-being becoming high (3.8; $p < .01$) as did those who had increased their qualifications between 1996 and 1999 (1.8; $p < .05$) (Table 2)⁶. Previous research has shown a tendency for life satisfaction, or happiness, to increase with educational achievement (Blanchflower and Oswald, 2002; Inglehart, 1990), although Veenhoven (1984) found that the relationship was stronger in poor countries than in rich ones. Campbell and colleagues (1976), however, found educational achievement generally had an inverse relationship with life satisfaction, which they suggested is due to an increased awareness of alternatives among educated people, causing them to be more critical of their current situation.

Leisure time was also significantly associated with improved well-being. The pursuit of leisure activities has been associated with social motivation and the benefits from social support and social interaction (Milligan *et al.*, 2004). The research reported here shows that increased satisfaction with amount of leisure time for women (2.2; $p < .001$), and use of leisure time for men (1.8; $p < .05$) is associated with improved well-being. Women who report having good leisure facilities in their neighbourhood also had higher odds (1.3; $p < .01$), but this was not significant when other variables were controlled for.

Social support is another important factor in terms of promoting well-being, further supporting previous research which suggests that good social support can act as a buffer to stress (Triemstra *et al.*, 1998; Ville *et al.*, 2001). Improvements in social support are positively associated with improvements in well-being for both genders (the odds increased between 1.7 and 3.8). Although social support was not significant among women when all the variables were controlled for, generally for men any form of social support is better than none or poor support. Previous research has shown that the availability of social support, can be a valuable “resistance resource” in the event of life changes, even if not called upon, simply knowing that the resources of other people are available increases an individual’s strength and tension resolving ability (Antonovsky, 1974).

Promoting Well-Being

The findings from this research have important implications for how we understand, measure, and promote well-being. Positive well-being should be studied in

its own right and not be inferred through studies which focus on negative well-being states. The evidence suggests that personal assessment of life circumstances were the most important factors in understanding variations among individual's whose well-being had improved. These factors have implications for measures of national progress which should address individuals subjective (as well as objective) circumstances in particular as they relate to satisfaction levels or self-perceived circumstances.

Although Andrews and Withey (1976) found that satisfaction with life overall was the most important variable in understanding variations in well-being, the findings reported here suggest it is not *the* best explanation of *changes* in well-being. Among women whose well-being had become high, satisfaction with health was more important and among men satisfaction with work and health were more important. As Diener and colleagues (2003) suggest there are different types and levels of subjective well-being, influenced by achievement of goals at a lower (moment-to-moment) and higher (more abstract) levels. Global measures such as satisfaction with life overall may only assess subjective well-being at a higher more abstract level and are unable to capture the complex nature of factors that may influence lower levels of well-being which focus on goals of a more immediate nature. A more diverse measure, such as the adapted GHQ12 used here, is needed in order to validly access the positive and negative emotions associated with the promotion of high well-being.

The results have found that objective income is not a good predictor of well-being, when other variables are controlled for. Through measuring positive well-being directly, the evidence suggests that actual income levels are a poor predictor of life satisfaction and subjective comparisons of financial circumstances are more important to understanding variations in high levels of well-being. Although individuals may be objectively better off (i.e., remaining in the fourth income quintile in 1996 and 1999 would actually mean an objective increase in income over time), they don't feel better off because they still occupy the same position in society relative to those around them (i.e., despite an increase in income they have not moved up into the fifth income quintile) (Blanchflower and Oswald, 2002; Wilkinson, 1996). Supporting theories which suggest over time individuals become accustomed to gains in material circumstances and expectations increase (de Botton, 2004) so that any short-term enhancement in mood does not manifest itself into long-term alteration in level of well-being (Kahn and Juster, 2002).

This is not to say that economic growth and higher incomes are detrimental in all circumstances (Reeves, 2002b). Some developments have been beneficial through improving quality of life where goods and services have become available to those who might not otherwise have access (Frank and Cook, 1995; Reeves, 2002b). For developing countries, economic growth does still promote an element of happiness, but the results reported here would support the existence of a curvilinear relationship between income and well-being (Veenhoveen, 1991), and that there is a point at which the correlation between economic growth and well-being seems to break down (Reeves, 2002a).

Although economic theory has been criticised in respect of explaining well-being, some changes in socioeconomic circumstances are important to the promotion

of well-being, particularly in respect of the positive association of becoming engaged in the labour market, or being satisfaction with work or income. However, improvements in well-being brought about by improvements in socioeconomic conditions may not just be attributed to their monetary gains. For example, work has been positively related to happiness levels where it is a source of social respect (Veenhoven, 1984), and enhances social relationships and interaction (Argyle, 1987). Within a capitalist society engagement in the labour market may also be indicative of the importance of social integration in promoting well-being. Where employment is associated with improved well-being, this has implications for employment policies particularly the increasing flexibilisation of the labour market (Pahl, 1995) and greater insecurity in employment, which is detrimental to well-being (Ferrie *et al.*, 2005). Providing training, education, and employment opportunities may increase well-being in the short-term, however if well-being is to be sustained then policy also needs to address the availability of rewarding jobs in a secure employment environment.

The importance of health in understanding well-being implies that a holistic approach is needed to promote healthy living as well as ill-health prevention. The findings reported here support previous studies which have identified the emergent properties of deterioration in health functioning and reduced levels of well-being. However, it has also shown that having good health or experiencing improvements in health status has a positive relationship with improved well-being. Blaxter (1987) suggests that individuals perceive their own health in terms more than physical state but consider their healthiness in terms of psychological fulfilment and ability to cope, and this may account for the positive relationship between health and subjective well-being found here. The notion of health is greater than the sum of its medical components, and the pursuit of health promotion may be more beneficial to enhancing well-being than merely focussing on the prevention or cure of ill-health.

Greater recognition of life events and life chances is important if well-being is to be improved either through life-long learning, engagement in secure employment, or greater support for those who are excluded from the labour market. Change in circumstances or the experience of a life event may provide the opportunity for advancement and self-fulfilment. The pursuit of knowledge is considered a high order need and provides one of the conditions towards self-actualisation (Maslow, 1954). This research shows that re-entering education and improvements in qualification level are associated with positive well-being. This has implications for the pursuit of life-long learning and the availability and accessibility of educational opportunities beyond the formative school years. The amount and use of leisure time is also positively related to improved well-being, and may be associated with the opportunities for self-motivation and achievement, as well as the associated health (Fenner, 1987) and social benefits (Argyle, 1987). There are implications here for the availability and accessibility of leisure friendly environments within communities.

It has been shown that social support and social integration are important in improving well-being. The ability to participate in and be a part of society either through employment, education, or pursuit of leisure activities suggests that the

ability to have “the resources to participate in activities and obtain the living conditions and amenities which are customary, or are at least widely encouraged or approved, in the societies to which people belong” (Townsend, 1979) are just as important today in understanding improvements in well-being as they have been in understanding or measuring deprivation.

Conclusion

In conclusion this research has shown that contrary to life event theory, change per se is not necessarily detrimental to individual well-being. Whilst some changes in circumstance have a negative association many are positively related to promoting well-being and may provide the opportunity for self-fulfilment. Social support and social integration are important in improving well-being, with the ability to participate and be a part of society either through employment, education, or leisure activities, having positive consequences.

Overall subjective assessments of circumstances are more important than objective conditions, although the differences in domain satisfaction suggest analysis at a more in-depth level than global assessment of life overall may be needed in order to understand *improvements* in well-being. Economic progress is generally assumed to equate to well-being, supported by research on factors related to negative well-being states, however, by adopting a positive research focus, the findings reported here have shown that affluence in itself does not necessarily guarantee improvements in well-being, particularly where individuals become accustomed to their circumstances, and are continually seeking higher status relative to those around them. Suggesting there comes a point at which increased wealth becomes uncoupled from increased well-being.

These findings have important implications for social policy. Policies need to address those aspects which promote health and enable fulfilment through education and leisure, whilst addressing those issues which inhibit life chances including insecurity in the labour market, or which bring about a false sense of negative well-being where the perpetual pursuit or “more” means needs can never be fulfilled and improved satisfaction is always on the next rung of the economic ladder.

Subjective circumstances as well as objective conditions are important in understanding well-being, however, promoting well-being among a nation cannot be achieved by addressing assumptive issues borne as a by-product of studies which focus on negative states. Factors associated with improved well-being will only be identified where positive well-being becomes the focus of social research.

Notes

1. This research is part of a PhD funded through the ESRC and work was completed with the support of an ESRC and Durham University Funded postdoctoral fellowship. The UK Data Archive bear no responsibility for the analyses or interpretations presented here. I am grateful to Roger Burrows, Susan Smith, and other anonymous referees for their thoughtful and constructive comments.

2. Measures for those with psychological disorder, for example, the Minnesota Multiphasic Personality Inventory (Hathaway and McKinley, 1943), or measures for those who were self-actualisers, for example Shostrom's (1963) "Personal Orientation Inventory."
3. For example, Holmes and Rahe's (1967) "Social Readjustment Rating Scale" and the "Schedule of Recent Experience."
4. Two models were developed within the Health theme. Self-reported health status could include a cognitive assessment of the psychological elements that are also included in the individual measures which were combined to make the measure of subjective well-being, potentially creating a tautology. Self-reported health status was the only variable to be included in the health model initially, when it was removed from the analysis health functioning was included for both genders, and number of health problems was also included in the model for women.
5. For a full description of the variables and methodology see Searle (2005).
6. Although education did not have an independent influence on promoting well-being when other variables were controlled for.

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Importance and Satisfaction With Life Domains in Croatia: Representative Sample

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Introduction

Satisfaction with life and well-being of the nation recently become of the great interest among researchers in the countries that went or still have been undergoing economical, social or political transformations (Tsou and Liu, 2001; Hayo and Seifert, 2003; Cheung and Leung, 2004). The meaning of one's well-being would be better understood within the social, political, and cultural context in which the individuals live. Croatia, which went through a war to become an independent country, went through the transformation process toward a democratic political system and a market economy in very short period of time. Currently, the priority of the country is to meet the criteria to be considered as a candidate for entering the European Union. How people in Croatia evaluate their lives and whether they are satisfied with particular domains in life in this time of democratic development is still an unexplored topic in Croatia.

In the life satisfaction literature different approaches are taken with regard to general versus domain-specific satisfaction (Diener, 1984; Cummins *et al.*, 2003; Hsieh, 2003). Briefly, the top-down approach assumes life satisfaction as a predisposition, so that global measures of satisfaction with life are sufficient to describe personal well-being. According to a bottom-up approach, the life satisfaction is best measured by summing or averaging satisfaction over several different life domains and by that may offer better aggregate sense of individual's well-being.

Some researchers point out the usefulness of measuring separately different areas or domains of life, as a way to better understand one's well-being (Cummins, 2002b; Cummins *et al.*, 2003). There is still lack of consensus which set of domains should best capture the personal well-being (Cummins, 1996; Hsieh, 2003). Cummins (1996) suggested seven domains as components of global quality of life. These are: material well-being, health, productivity, intimacy, safety, place in community, and emotional well-being which have been already incorporated in different questionnaires and research (Cummins, 2002a; Hsieh, 2003).

Besides satisfaction, some researchers suggest that the importance of specific life domains should be captured in exploring the quality of life (Cummins, 1996, 2002b; Renwick *et al.*, 1996). How to weight and add this component to global

measure of quality of life is still under discussions (Trauer and Mackinnon, 2001; Cummins, 2002b). Some researchers propose multiplicative scores by multiplying satisfaction and importance ratings, while others suggest weighting by domain importance ranking (Cummins, 2002b; Hsieh, 2004). Nevertheless, when we are exploring quality of life of particular population in the context of present social and economic circumstances, both satisfaction and importance could give us some valuable information.

There is a body of research on the relationship between two basic variables of age and gender and subjective well-being (Latten, 1989; Shmotkin, 1990; Diener, 1984). When subjective well-being is measured as a global life satisfaction, generally a positive relationship with age is found. For domain-specific satisfactions the relationships are not always linear (Shmotkin, 1990). Some authors suggested a U-shaped relationship between age and subjective well-being (Clark and Oswald, 1996). Most researchers agree that feelings of well-being comprise two components: a cognitive-evaluative one connected with long-term assessment of satisfaction with life as a whole and affective one connected with recent individual experience and happiness (Shmotkin, 1990; Diener, 1984). The former component seems to be positively correlated with age, while later seems to negatively correlate with age.

Concerning gender and subjective well-being, little or no differences are usually found (Veenhoven, 1996). However, when affective component of subjective well-being is taken into consideration or when domain-specific quality of life is measured then the effect of gender should be taken into account. Clark and Oswald (1996) reported that women had higher levels of happiness than men. Also, some researchers pointed out that the differences in gender could be better explained in age by gender interactions (Shmotkin, 1990). It seems that incorporating age and gender in the research would lead to a better understanding of the structure of society and people's well-being (Cheung and Leung, 2004).

In our study we were interested in separate estimates of importance and satisfaction with different life domains in Croatian citizens. As age and gender can shape the evaluation of one's well-being, we also examined these two fundamental variables. Particularly, the purpose of this study was to explore age and gender differences in separate ratings of importance and satisfaction with material status, health, achievement in life, relationships with family and friends, feelings of physical safety, acceptance by the community where they live, and their happiness.

Methods

Subjects

Subjects were a representative sample of Croatian citizens, recruited as a part of a public opinion research project (Nov/2003). There were $N = 1242$ subjects, 558 males, and 684 females. Four age groups were distinguished. Young adults were 18–29 years old ($M = 23.7$, $SD = 3.4$), middle aged group were 30–44 years old ($M = 37.1$, $SD = 4.3$), aged adults were 45–59 years old ($M = 51.7$, $SD = 4.1$), and older adults were 60–89 ($M = 69.1$, $SD = 6.6$).¹

Procedure and Instruments

The survey was conducted at 125 locations over Croatia by in-person interviews in respondent's home. The survey was focused on public opinions in pre-election period with additional part of questions covering different aspects of people's life and behaviors.

Importance of and Satisfaction with Life Domains. For purpose of our study we used adapted Croatian version of "Comprehensive Quality of Life Scale—Adult"² (Cummins, 2002a). It measures importance of, and satisfaction with, different life domains. Subjects reported how important they find seven specific domains of life: material status, health, achievement in life, relationships with family and friends, feelings of physical safety, acceptance by the community where they live, and their happiness. Also, they reported how much they were satisfied with the same seven life domains. Both, importance and satisfaction with each domain, were rated on the 10-point scales with scores ranged from 1 = "not at all important"/"not at all satisfied" to 10 = "extremely important"/"extremely satisfied."

Results

The characteristics of the representative sample of Croatian citizens are presented in Table 1.

To examine the differences in importance and satisfaction ratings of seven life domains by gender and age groups, separate multivariate analyses of variance (MANOVA) were used. Gender and age groups (i.e., young, middle, aged, old age) were independent variables. In the first MANOVA, dependent variables were ratings of importance of seven life domains, while in the second one, dependent variables were reported satisfaction with the same seven life domains.

Table 1. Characteristics of the representative sample of Croatian citizens (N = 1242).

Demographic variables	
Age	
Median	47
Range	18–89 years
Age groups—frequency (%)	
Young (18–29)	236 (19)
Middle (30–44)	336 (27)
Aged (45–59)	311 (25)
Old age (60+)	359 (28)
Gender	
Female	684 (55)
Male	558 (45)

Importance Ratings

The mean scores and associated standard deviations for importance ratings of seven life domains by gender and four age groups are presented in Table 2.

In analyses of importance ratings a significant multivariate main effects for both, gender ($F_{7,1219} = 2.61, p < .01$) and age groups ($F_{21,3500} = 2.98, p < .01$) were found. Univariate tests for gender revealed that this effect was significant only for the happiness measure ($F_{1,1225} = 9.36, p < .01$). Happiness was rated as more important for women than for men. Univariate tests for age groups revealed significant differences for achievement in life ($F_{3,1225} = 4.52, p < .01$), happiness ($F_{3,1225} = 4.20, p < .01$), feelings of physical safety ($F_{3,1225} = 3.95, p < .01$), material status ($F_{3,1225} = 3.87, p < .01$), relationships with family and friends ($F_{3,1225} = 3.25, p < .05$), and health ($F_{3,1225} = 2.93, p < .05$). Material status, health, and achievement in life were less important for the old age group than all others age groups. Importance of relationships with family and friends were rated higher in middle and aged than old age group. Physical safety was more important for both, middle and aged groups, than young group. Additionally, aged rated physical safety as more important than old age group. Finally, old age group rated their happiness as less important than young and aged group.

Multivariate main effect for interaction between gender and age groups was significant ($F_{21,3500} = 1.63, p < .05$). Univariate tests revealed significant interactions for achievement in life ($F_{3,1225} = 6.41, p < .01$), health ($F_{3,1225} = 3.99, p < .01$), and happiness ($F_{3,1225} = 3.18, p < .05$). Subsequent analyses of the means showed that in old age group women rated achievement in life less important than man, while for young group was reversed, that is, women rated it as more important than man. Concerning the health, it was rated more important for young man than young women. This was reverse in old age group, with man reporting health as less important than woman. Finally, happiness in young group was rated more important for women than man, while in old age group was reverse.

Table 2. Descriptive statistics for Importance ratings of the seven life domains by gender and age groups (N = 1242).

	Importance with life domains M (SD)						
	Female	Male	Young	Middle	Aged	Old age	Total
Material	7.8 (2.05)	7.8 (2.08)	7.9 (1.94)	8.0 (1.89)	7.9 (2.10)	7.5 (2.23)	7.8 (2.06)
Health	9.6 (1.10)	9.5 (1.13)	9.7 (.97)	9.6 (.98)	9.6 (1.11)	9.4 (1.29)	9.6 (1.11)
Achievement	8.5 (1.81)	8.6 (1.64)	8.7 (1.55)	8.6 (1.64)	8.6 (1.73)	8.3 (1.91)	8.5 (1.74)
Family	9.4 (1.12)	9.4 (1.14)	9.4 (1.18)	9.5 (.97)	9.5 (1.07)	9.3 (1.27)	9.4 (1.13)
Safety	9.0 (1.53)	8.9 (1.56)	8.8 (1.58)	9.0 (1.48)	9.2 (1.40)	8.8 (1.67)	9.0 (1.54)
Community	8.6 (1.80)	8.7 (1.70)	8.6 (1.73)	8.5 (1.80)	8.8 (1.69)	8.6 (1.79)	8.6 (1.76)
Happiness	9.4 (1.23)	9.1 (1.45)	9.5 (1.11)	9.2 (1.38)	9.4 (1.30)	9.1 (1.42)	9.3 (1.33)

Satisfaction Ratings

The mean scores and associated standard deviations for satisfaction ratings of seven life domains by gender and four age groups are presented in Table 3.

In analyses of satisfaction ratings a significant multivariate main effects for both, gender ($F_{7,1211} = 2.71, p < .01$) and age groups ($F_{21,3478} = 12.89, p < .01$) were found. Interaction by gender and age groups was not significant in the case of satisfaction with life domains. Univariate tests for gender revealed that this effect was significant for health ($F_{1,1217} = 7.46, p < .01$) and feelings of physical safety ($F_{1,1217} = 6.10, p < .01$). Men were more satisfied with their health and physical safety than women.

Univariate tests for age groups revealed significant differences for health ($F_{3,1217} = 76.47, p < .01$), feelings of physical safety ($F_{3,1217} = 5.48, p < .01$), happiness ($F_{3,1217} = 5.32, p < .01$), material status ($F_{3,1217} = 3.89, p < .01$) and achievement in life ($F_{3,1217} = 1.80, p < .05$). Satisfaction with health declined significantly with each age group. Furthermore, old age group rated physical safety as less satisfying than all other groups. Satisfaction with own happiness was rated higher in the youngest and middle than aged group, while the youngest were more satisfied with their happiness than the oldest. Satisfaction with material status was rated higher for young and middle than aged group. Also, the youngest were more satisfied with their material status than the oldest. Achievement in life was more satisfying for youngest and the oldest than for aged group.

Discussion

The purpose of our study was to examine the quality of life of Croatian citizens, as well as gender and age differences in their estimates of importance of, and satisfaction with, different life domains. Instead of using a global measure of quality of life or life satisfaction we used more specific measures which capture seven specific life domains.

Table 3. Descriptive statistics for satisfaction ratings of the seven life domains by gender and age groups (N = 1242).

	Satisfaction with life domains M (SD)						
	Female	Male	Young	Middle	Aged	Old age	Total
Material	5.4 (2.43)	5.6 (2.47)	5.7 (2.32)	5.8 (2.37)	5.2 (2.51)	5.4 (2.53)	5.5 (2.45)
Health	6.8 (2.57)	7.2 (2.62)	8.4 (1.92)	7.7 (2.16)	6.5 (2.58)	5.7 (2.68)	7.0 (2.60)
Achievement	6.8 (2.17)	6.9 (2.16)	7.1 (2.10)	6.9 (2.13)	6.6 (2.22)	7.0 (2.19)	6.9 (2.17)
Family	8.6 (1.70)	8.5 (1.72)	8.7 (1.53)	8.7 (1.45)	8.5 (1.82)	8.4 (1.93)	8.6 (1.71)
Safety	7.9 (1.92)	8.2 (1.83)	8.2 (1.70)	8.3 (1.70)	8.0 (1.98)	7.8 (2.04)	8.1 (1.19)
Community	8.3 (1.81)	8.4 (1.68)	8.3 (1.78)	8.5 (1.47)	8.2 (1.92)	8.4 (1.84)	8.3 (1.75)
Happiness	7.6 (2.09)	7.8 (1.98)	8.1 (1.79)	7.9 (1.91)	7.5 (2.25)	7.6 (2.10)	7.7 (2.04)

In the literature ratings of importance and satisfaction are seen as the components of subjective quality of life (Cummins, 1996; Renwick *et al.*, 1996; Hsieh, 2003, 2004). Researchers regard quality of life as a function of the relative importance of particular domain and the extent of the individual's satisfaction with it. Lower satisfaction with a particular domain, if this domain is of lower importance, has a smaller impact on quality of life than the same level of satisfaction with more important life domains. In our study we used a Croatian version of "Comprehensive Quality of Life Scale—Adult," which measured both components that we were interested in and also covers specific life domains (Cummins, 2002a). However, instead of using the original scoring, by multiplying importance and satisfaction or some other proposed weighting methods (Cummins, 2002b; Hsieh, 2004), we treated these two components as separate constructs.

An alternative to measure "life as a whole" or follow the "top-down" approach, we used specific-domain or "bottom-up" approach in evaluating importance and satisfaction with life domains (Diener, 1984). There is still discussion in the literature regarding the relationships between individual life domains and global quality of life (Hsieh, 2003, 2004; Diener, 1984). However, we were more interested in examining separately each life domains rather than averaging them. In other words, our primarily goal was to explore the general population and how today's social and economic circumstances reflect what people perceive as important in their life, and how much they were satisfied with each domain.

The seven domains that subjects rated were material status, health, achievement in life, relationships with family and friends, feelings of physical safety, acceptance by the community where they live, and their happiness. These domains were used in other studies and seem to cover the most important life areas that capture personal wellbeing (Cummins *et al.*, 2003; Hsieh, 2003). Moreover, in terms of motivations, most of these domains could be described as the basic "lower" needs (Maslow, 1970). In his theory of human motivation, Maslow defined first a set as physiological needs, such as a need for food. That particular domain was not represented in this group of domains as it was assumed that this need is fulfilled in our population. Domains of health and physical safety could be included under the set of "safety needs." After these sets of needs are gratified, according to Maslow, love and belongingness appear next. Family and friends, acceptance by the community and happiness, could be described under this set of needs. After fulfilling them, "higher" level needs (i.e., "needs for esteem"), like achievement in life and material status, are becoming important.

Other authors in similar way define two different types of goals, intrinsic and extrinsic (Sheldon and Kasser, 2001). First are motivated by psychological needs and tend to focus on personal growth and community connections while later by security needs and tend to focus on possessions, status, and wealth. Concerning our domains, health, friends, family, physical safety, acceptance of the community, and happiness could be seen as a part of the intrinsic goals, while material status and achievement in life could be seen as part of extrinsic goals.

Overall, our results showed that the Croatian population rated the most important domains in their life as follows: health, relationship with family and friends, happiness, feelings of physical safety, and acceptance by their community. The least important domains were material status and achievement in their life. In other

words they rated as more important the intrinsic goals set and the least important extrinsic goals set. Some authors argue that importance could not be used as a measure of the need (Cummins, 2002b; Wicker *et al.*, 1993). However, the importance of goals could reflect a person's value system. That is, high importance can indicate which goals are valued.

In one extensive report on life satisfaction in Europe (Delhey, 2004), which included countries from European Union and candidate countries, respondents were asked to choose the most important items which contribute to their quality of life. The results showed that being in good health contributes most to quality of life, followed by sufficient income to meet needs and having family around when needed. Croatian citizens produced rather similar ratings of importance with life domains considering the health and family domain.

With regard to satisfaction with specific domains, the Croatian population showed to be the most satisfied with domains of family and friends, then feelings of physical safety, happiness, and acceptance by their community. On the other side, they reported to be the least satisfied with their material status. In the view of Maslow's theory, "lower" needs were rated as more satisfying, than "higher" level needs by Croatian population. The similar argument could be presented for satisfaction ratings. However, satisfaction ratings of the domains may indicate how different domains are fulfilled in the particular social and economic status of the population.

In comparison with other European countries the ranking of satisfaction with domains in Croatia is quite similar (Delhey, 2004). In most of the examined countries the highest satisfaction was found either with neighborhood, home, or family life, while financial situation and the country's health care system were rated as the least satisfied (Delhey, 2004).

Further in our analyses, we were interested if women and men, as well as different age groups, showed differences in importance and satisfaction ratings of life domains. The analyses revealed more significant differences between the age groups than between genders.

Concerning the gender differences, in general, women rated importance of happiness higher than men. However, the main effect of gender is moderate by age in a way that the differences diminish with age. In other words, the highest differences between women and men emerged in the youngest age group (i.e., 18–29 years). On the other side, men were more satisfied with their health and physical safety than women.

The importance of health showed no main effect for gender. However, there was significant interaction between gender and age. At the youngest age group (i.e., 18–29 years), importance of health was much higher for women than men. From age 30 to 60 years, the importance of health was equivalent between women and men, while in the oldest age group (i.e., 60 and above) the importance of health was much lower for women than men. The higher importance of health in young women might reflect their concern of childbearing and building a family. Differences in the oldest age group might be the consequence of different retirement age in men and women (in Croatia retirement age for women is 60 and for men 65 years). As men stay longer in a workforce than women, importance of health is more relevant for them at that age group. Men also have a lower life expectancy, so health concerns emerge earlier in life for men than women.

A similar pattern could be seen for achievement in life domain. For men the importance of achievement domain remains fairly constant through the life span. However, for women there is a big decrease in oldest age group as they rated that domain as less important than men. Again, one possible explanation could be in terms of retirement. Since women can retire earlier in Croatia, importance of achievement could diminish with that.

Concerning only the age differences, material status and achievement in life were less important for old than all others age groups. These results are in accordance with the findings that older people express a fewer worries about their finances than younger people (Powers *et al.*, 1992). Lower importance of material and achievement domains, which represents an “extrinsic” goal set, could be viewed in light of socioeconomic selectivity theory (Carstensen *et al.*, 2003). Besides other things, this theory postulates that perceiving limited time, which older people are more aware of than younger, leads to motivational change and increase attention to emotionally meaningful goals. Also, according to this theory it could be expected that the old age group perceives family relationships as more important than other groups. However, in our study importance of relationships with family and friends were rated higher in middle and aged than old age group. One of the reasons could be that people in age groups from 30 to 59 years are in process of generating a family, so that importance with this domain becomes a priority. Next finding that physical safety was rated as more important in middle and aged groups than in the youngest and oldest, may be explained in similar way. Priority in building and supporting the family may consequently give more importance to physical security. It is obvious, out of these results that relative importances of goals or values changes as a function of age that is, through the life span.

It has been shown in the literature that older people are relatively happier and more satisfied with their life than younger adults (Diener and Diener, 1996). However, in our study the youngest were more satisfied with their happiness than the oldest. Moreover, old age group rated their happiness as less important than young and aged group. It could be that the cutting point for the old age group in this study was too early, as most of them were still part of work force.³

On the other side, in reports about quality of life in Europe (Keck and Delhey, 2004) it was found that in post-socialist countries (i.e., Czech Republic, Estonia, Slovenia, etc.), and also some Mediterranean countries (i.e., Portugal, Greece, and Spain), younger age groups are more satisfied than the oldest age groups. In the northern European countries (i.e., Denmark, Sweden, etc.) the oldest group is the most content one. Authors argue that system transformation in postsocialist countries puts younger and older people on very different opportunity track. Also, the differences in modern welfare and health care systems between compared countries could explain those findings (i.e., postsocialist countries are in the process of development in those segments). Croatia is confronted with both of the issues, that is, different life opportunities across the age groups and not yet developed health care and welfare system, which might explain why older age groups feel less satisfied than the youngest group.

Satisfaction with material status was higher for young and middle age group (i.e., 18–44 years), compared to aged group (i.e., 45–59 years). Also, the youngest

were more satisfied with their material status than the oldest. If we take into account present economic situation in Croatia, where pensions are much lower than work salaries, then this finding is not surprising. Existing age differences in satisfaction with particular domains could reflect the incidence of important life events for particular age groups as marital status change, family and work changes, retirement and others. Namely, according to a life-course approach, particular life-events are concentrated in certain periods of individual's life and could be related to satisfaction with life (Latten, 1989). On the other side, it could be that satisfaction ratings are indicators of the degree to which needs of people are met. Revealing how certain life domains are evaluated could be useful for policy makers for improving well-being of citizens.

In general, results support the notion that there are age differences in importance with different life domains as well as in estimates of satisfaction. However, we have to be careful in interpreting these results as specific domains could be differently meaningful to people of different ages. The differences in importance of life domains across the age groups suggest that certain kinds of goals are related to age and are most likely to change through the life span. The differences in satisfaction with life domains pointed out specific domains in which particular groups are more vulnerable than others which also could be reflection of changes through the life span. However, future research is needed, that is, beside the subjective measures of importance and satisfaction with life domains, it would be useful to include the objective measures and social indicators in evaluating a society.

Notes

1. Age categories are used because the effect of age is not expected to be linear. For example, Carstensen's research and other authors show increase of subjective well-being in elderly group (Carstensen *et al.*, 2003; Lang and Heckhausen, 2001). Also, according to life-course approaches there are life events specific for age groups (Latten, 1989).
2. As there are no existing psychometric data on the translated Croatian scale we performed factor analyses and reliability analyses of 14 items (i.e., importance and satisfaction with seven life domains) on the whole Croatian sample. Principal component analyses yielded two factors: first factor was grouping of all importance of life domains items, while second one consisted of satisfaction with life domains items. The internal reliability for two subscales were: for importance of seven life domains Cronbach's alpha was .79, while for satisfaction with seven life domains Cronbach's alpha was .81.
3. Additional analyses, confirmed that adults old 72 and above years, rated importance and satisfaction with their happiness same as young adults ($t = 1.79$, $p < .07$, $t = 1.86$, $p < .06$, respectively).

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Part II

Advancing Quality of Life in Selected Sectors

Commuting and Quality of Life: The Italian Case

GIAMPAOLO NUVOLATI

Introduction

Cities are nowadays characterized by the presence of a growing number of commuters. Commuting practices are not only increasing but also transforming in connection with changes in residential patterns, labor markets, transport facilities, and household structure. Commuting toward the metropolis can generate a weakening of identity and linkages with the origin community and with respect to the family, a sense of risk in relation to criminality issues, health and psychological problems, and transport costs. But commuting also contributes to improving economic conditions, job opportunities, cultural level, and to maintaining a relationship with the social and environmental local context as well as with the large and fascinating city. One of the main results of these daily flows is that cities are currently characterized by the presence of different resident and non-resident populations competing in the processes of accessing, controlling and using local resources and services (Nuvolati, 2003a). Therefore, communities are no longer stable and closed entities but interact every day with different populations coming from different places.

The Increase of Commuting Practices Worldwide

In many metropolitan areas of the world, the number of commuters is constantly growing and commuting trends are mainly the consequences of:

- increasing processes of sub-urbanization,
- general improvements in transport systems,
- difficulties in substituting physical relationships with virtual relationships through the diffusion of technological devices,
- lasting concentration of work opportunities and important functions in large urban centers combined with new patterns of residential distribution and leisure activities in the countryside.

Commuting is therefore a worldwide phenomenon (Table 1) and the main means of transport employed by workers include:

- public transport (especially in Latin American Countries and East European Countries),
- car (especially in the more industrialized countries),
- on foot or by bike (Africa and Asia Pacific),
- on average, people spend around half an hour to arrive at the work place.

The Evolution of Commuting

Commuting practices have changed considerably during the last decades. The transformation from a Fordist to a post-Fordist phase, the diffusion of technological

Table 1. Traveling to work in cities.^a

	Time and means of transport							
	Min.	Car (%)	Pub. ^b (%)	Motor cycle (%)	Foot or bicycle (%)	Car owners × 1.000 ^c	Road expenditures \$ ^d	Person/Hectare
Africa	37.3	11.8	30.6	8.4	44.9	32.4	5.82	146.0
LAC	36.6	25.2	54.5	2.0	26.2	101.1	15.36	149.8
Transitional	35.8	18.4	63.5	1.9	19.4	177.6	55.49	126.2
Asia Pacific	31.9	9.0	29.0	18.7	38.4	78.9	2.50	247.2
Arab States	31.9	27.4	32.1	4.3	21.3	63.3	32.65	252.0
Industrialized	25.0	54.9	24.1	2.2	23.3	423.5	115.67	82.4
Low HDI ^e	34.0	10.0	22.5	1.0	43.2	41.1	4.00	190.4
Medium HDI	39.0	18.4	50.8	9.5	19.4	78.6	32.00	158.5
High HDI	28.0	45.1	31.7	10.2	18.7	354.4	81.00	98.8
Very low CDI ^f	36.0	10.3	32.6	9.8	48.8	23.8	4.00	146.8
Low CDI	32.0	11.7	28.2	15.7	44.0	38.1	4.00	189.8
Medium CDI	38.0	15.4	51.7	3.8	26.4	58.7	9.00	211.1
High CDI	37.0	22.2	45.5	2.0	19.9	137.4	15.00	127.7
Very high CDI	31.0	50.4	25.0	3.5	16.4	356.5	107.00	74.5
(N = 247)	34.4	21.9	37.1	8.2	34.2	144.6	32.69	154.0

Sources: UNCHS (Habitat), Global Urban Indicators Database, 1996.

^a Indicators and data were collected for the urban agglomeration (defined as the built-up or densely populated area containing the city proper; suburbs, and continuously settled commuter areas); however, some data were collected at the metropolitan area level.

^b Work trips by public transports are the percentage of trips to work made by bus or minibus, train or tram. Buses or minibuses refer to road vehicles other than cars taking passengers on a fare-paying basis. Other means of transport such as taxi, ferry, rickshaw, or animal are not included.

^c Defined as the ratio of automobiles per 1000 population. Automobiles in this case are taken to include all private motorized vehicles exclusively used for personal transport (including sedans used for business).

^d Defined as the per-capita expenditure in U.S. dollars on roads (3 years average). Expenditure includes capital and maintenance expenditure on all roads in the urban area, averaged in constant value terms over three years. Where some roads are built or managed by non-city authorities (i.e., national or state) the amount spent in the urban area is estimated.

^e Cities have been ranked using the Human Development Index of their country.

^f Cities have been ranked using the City Development Index.

Table 2. Commuting in the fordist and post-fordist period.

Fordist period	Post-fordist period
Industrial sector	Tertiary, information and technology sector, and creative sector
Fixed working time schedules	Flexible time
Daily travel	Possibility to work at home
Commuting for the entire length of one's labor life	Commuting for a period of one's labor life
One travel destination	More travel destinations
Public transport	Private, public or mixed transport
Low quality of the means of transport (frequency, time, heating, cleanliness)	Better quality (but not optimum)
Possibility to read the newspaper, to chat	Possibility to communicate, to work during travel
Spatially circumscribed activities in the destination place (mainly inside the factory space)	Open contacts within the destination city for different type of working and consuming practices

personal devices and the flexibility of working schedules, caused a general betterment in commuting. An increasing number of commuters, at least in the more advanced countries, work in the tertiary or quaternary sector, often change their work destination, can also tele-work at home for some days a month, and have and use time-consuming and time-saving instruments when traveling (Table 2).

This does not however mean that all of the problems relating to transport have been solved. Commuters' opinions about travel means are still often negative. Therefore, what is changing is not really the infrastructure system in which individuals move, but the capacity of individuals to deal with specific problems, to develop a strategy in order to combine and solve several needs (for example: identity, income, labor, family relationships, transport, leisure and consumption). In particular, these issues are nowadays framed through different places and according to different mobility patterns scattered over the territory. Commuters are also creating specific associations at the local level which are finalized to defend their rights and through which they are able to negotiate at different levels with local authorities and representatives the improvement of conditions in the transport system.

Commuting and Quality of Life

Today, commuting practices linked to alternative work activities and living styles show an increasing process of segmentation. In particular, we can distinguish between different types of commuters according to the following variables: place of residence, family composition, type of job, moving frequency, means and time (Table 3).

The item "place of residence," in particular, refers to different life choices, more or less constrained. As a matter of fact, people decide to commute:

- because a process of gentrification makes it impossible for them to continue to live close to the place where they work, and they are forced to move to the periphery or hinterland,

Table 3. Types of commuting.

Place of residence	Forced by gentrification vs. free choice oriented toward new towns vs. native residence
Family composition	Single vs. couple vs. couple with children
Type of job	Workers vs. clerks vs. managers or self-employed
Frequency	Everyday vs. some days a week
Means	Private vs. public
Time (go and return)	Less than 1 hour vs. more than 1 hour vs. more than 2 hours

- because they freely decide to go and live in a town which may be well serviced and located in a pleasing environment, but far away from the place where they work,
- because they have grown up and continue to live in a city that is not close to the place where they work, but to which they are strongly identified.

These three models are, of course, fundamental in shaping the level of attachment of people to different locations, their determination to commute, and their quality and style of life. The other mentioned dimensions, however, also strongly contribute to create different patterns of mobility and adaptability. The composition and organization of the family, the type of labor, the possibility of a relatively short travel time, the reliability of the means of transport and whether they are public or private result in commuting routines which are varied and tolerable to varying degrees. Again, these aspects do not claim to provide a complete resolution of commuters' problems, but simply reveal multi-faceted perspectives to deal with them. Moreover, many studies recently focused on the relationship between immigrant commuting and residential segregation (Preston *et al.*, 1998), between commuting and gender (Madden and Chen Chiu, 1990; Tkocz and Kristensen, 1994; Blumen, 1994, 2000) and life style (Manning, 1978; Camstra, 1996) revealing how commuting practices can contribute to alter socio-economic disparities.

Negative and Positive Aspects of Commuting

Commuting practices present positive and negative aspects strongly influencing the quality of life of the population. On the one hand, commuting means travel costs, the wasting of time, the weakening of identity, health problems and exposure to criminality and different types of accidents. Many witnesses about commuters' problems are available on the BBC News website and in particular on the page titled: "Commuters suffer extreme stress" (Tuesday, November 30, 2004). We report here just two of them: "I haven't had my blood pressure checked in a while, so I can't say whether my blood pressure has gone up since I started working where I am now, but forget 45–60 minutes: I have to travel 2 hours to work (and obviously 2 hours back) every day and the stress is unreal. I've become bad tempered and am unwilling to do anything over the weekend because I am too exhausted"; "Traveling to work is a nightmare. Every morning I travel to work to find road works and cones closing off

Table 4. Negative and positive aspects of commuting.

Negative aspects	Positive aspects
Travel costs	High wage earned in the destination city and low cost of living in the origin city
Travel time	Activities during travel (computing, phoning, reading the newspaper, chatting)
Weaker identity and relationships with the local community	Opportunity to change contexts and to meet people
Exposure to criminality	Cultural and job opportunities
Health problems	Improvement of information and communication sources, education
Psychological problems, stress	

lanes. Every day it changes and cars are all over the place. I have tried to get a tram however that does not work because you never get a seat, you are squashed up to a large number of people. I can always count on the morning rush hour to wind me up for the rest of the day!” But, on the other hand, commuting also means higher earnings, increased opportunities in a more advanced environment and, therefore, the possibility to develop new experiences, and new social and cultural relationships (Table 4). It also means the possibility to rest and to read during the travel, especially for women: a break between work and family activities (Blumen, 2000).

Commuting as a pause is testified by other affirmations reported by the BBC News investigation: “Got to admit, most of the time on my commute I can get a seat and sit and read. To be honest it’s the best part of a working day.”

Data about Commuting and Quality of Life in Italy

In order to analyze commuting practices and quality of life in Italy, several sources are available. In particular, it is possible to consider three different type of data: (1) Census data about time and means of commuters travel, (2) survey data collected by Istat (Statistical Central Institute) or by private and public poll institutes at the national and local level about commuting habits and about satisfaction for the quality of life, (3) data from customer satisfaction investigations concerning the evaluation of the travel services in some cities.

Some Findings of the Italian Research

According to Census data, in Italy almost half of the population (47.0% in 2001) commutes to work or school everyday and among the commuters around 40% cross the border of their municipality. The percentage is higher for the periphery of the metropolitan area and for the medium sized municipalities, while in the more rural towns with less than 10,000 inhabitants the percentage of commuters decreases. Of course, people living in the core areas are less interested in outgoing

practices. From a more geographical point of view, commuting is more frequent in the North-Western regions of the country where large cities like Milan, Turin and Genoa, and corresponding metropolitan areas are located. But this is also the case in the North Eastern regions, characterized by thick networks of medium sized cities, where mobility is very high (Table 5).

Students with more than 14 years of age mainly use tram, bus and coach to go to school. Of course, if we consider all students, including pupils with less than 14 years of age, the percentages of students that go to school on foot or by car with their relatives increase. Workers clearly prefer to commute by car (around 2/3). Results based on survey (1995, 1998) or on Census data (2001) are not easily comparable. However, in 2001 only 8.7% of the workers' travels are made by means of public transports. Moreover, 58.7% of people (workers and students combined) need 15 minutes to travel to work or school; 13.0% from half to one hour; 3.5% more than one hour (Table 6).

Italian commuters' opinions—collected through customer satisfaction investigation—about travel means (specifically the train) are still often negative. Furthermore, the problem of train delays is rising (Table 7). During the last years many strikes in sector of the public transport and several protest actions performed by the commuters made in some cases the situation quite explosive.

Research findings show that quality of life in Italy is normally higher in small and medium sized cities than in large ones (Nuvolati, 2003b). But the paradox we are dealing with here is the following. How can residents of these communities enjoy better living conditions if they commute to another city every day? The answer is that the quality of life of the commuters is different from the quality of life of the more stable residents, but such a quality of life could be even better if commuters were able to exploit the positive aspects of commuting. The morphological configuration of Italy and its cultural traditions are elements that contribute to reinforce commuting practices. In particular, the scattered urbanization process based on a multi-cephalic pattern, the reduced distances between cities and the strong identity with local community, make commuting an accepted and diffused activity. The well know process called *voting with your feet*, useful for analyzing the quality of life of the city and based on the territorial re-distribution of the residents, does not apply as well in the Italian case as it does in Anglo-Saxon countries (Tiebout, 1956; Findlay and Rogerson 1991; Douglas and Wall, 1993). As a matter of fact, in Italy, residential patterns tend to remain more stable. People are inclined to live in the city where they were born and to commute, when necessary. A 1996 survey showed minor differences in the overall quality of life perception by several demographic and social variables, including means of transport used to go to work (Table 8). Also people using the train and therefore traveling for many minutes each day present a high level of satisfaction. Conversely, not all of the people who go to work on foot are satisfied with their quality of life. Occupation (employed vs. unemployed) seems to be the strongest predictor. But among employees the level of satisfaction is quite similar (Nuvolati, 1998).

Commuters are oriented to gain a balanced compensation between economic and familiar issues by playing a double role in the origin as well in the destination city. Lewis Mumford (1938) pointed out that the city has three main functions: to

Table 5. Percentage of commuters not working or studying in the same municipality where they live—Italy, 1998, 2001.

	1998	2001
Core of the metropolitan area	12.8%	
Periphery of the metropolitan area	54.5%	
Municipality with more than 50,000 inhabitants	67.2%	
Municipality with 10,001–50,000 inhabitants	53.5%	
Municipality with 2001–10,000 inhabitants	42.4%	
Municipality with less than 2000 inhabitants	22.9%	
North-West	50.6%	
North-East	45.7%	
Centre	33.3%	
South	34.9%	
Islands	30.1%	
Italy	40.4%	38.1%

Source: Istat, Multipurpose Survey on Families, 1998 and Istat, Census, 2001.

Table 6. Means and time employed to go to school or to work—Italy, 1995, 1998, 2001.^a

Means	Students (over 14 years of age)			Workers		
	1995	1998	2001 ^b	1995	1998	2001
Train	15.9	14.8	30.0 ^c	2.3	2.6	8.7 ^c
Tram/bus	22.9	23.0		4.9	5.3	
Metro	4.3	6.0		1.7	2.3	
Coach	26.7	29.3		3.3	3.4	
Car driver	10.6	10.6	6.6	65.0	66.5	65.8
Car (passenger)	13.2	13.6	30.7	6.2	6.0	5.1
Motorcycle	8.0	9.6	3.9	4.0	4.6	5.1
Bicycle	3.4	2.9	2.5	3.3	2.6	3.2
On foot	15.0	14.9	26.1	13.7	13.3	11.6
Other			.2			.5
Time	1995	1998		1995	1998	2001 ^d
15 minutes or less	31.8	29.7		50.9	48.3	58.7
16–30 minutes	29.5	29.8		24.1	24.7	24.8
31–60 minutes	15.2	13.3		7.6	6.9	13.0
60 minutes or more	18.2	19.6		6.1	7.2	3.5
Time variation	4.2	7.0		10.0	12.2	n. a.
Not answering	1.1	.6		1.2	.7	n. a.

^a For 1985, 1988 percentages are on student or workers, several of them using more than one mean (total > 100.0%); For 2001 percentages are on travels (total = 100.0%).

^b All students.

^c All public transports.

^d All students and workers.

n. a. = not available.

Source: Istat, Multipurpose Survey on Families, 1998 and Istat, Census, 2001.

Table 7. Train commuters dissatisfaction Level—Italy, 2004 (sample of commuters and trains in Milan, Rome, Naples).

Crowding		76%
Information		74%
Cleanness		70%
Regularity		69%
Air conditioning		52%
Safety		48%
Courtesy		39%
General dissatisfaction		71%
Percentage of delayed commuter trains (more than 10 minutes)		
	Milan (%)	Rome (%)
2002	21.5	24.7
2003	26.1	35.7

Source: Altroconsumo-Ultimotreno, Investigation on Commuters' Satisfaction, 2004.

Table 8. Satisfaction with quality of life (“very” or “enough satisfied”)—Italy 1996.

Sex		Education		Transport to go to work	
Male	82.5	No school	78.5	Car	84.8
Female	82.4	Elementary school	81.3	Train	84.2
Age		Secondary school first level	83.0	Bus	82.9
15–24 years	83.0	Secondary school second level	83.9	Bike	88.6
24–34	83.7	University degree	84.3	On foot	79.4
35–44	78.7	Area			
45–54	79.7	North-West	86.1		
55–64	79.2	North-East	85.5		
Over 64	88.9	Centre	84.3		
Occupation		South	77.1		
Entrepreneur/ self empl.	85.5	Community			
Clerk/teacher	83.8	Rural town	84.6		
Worker/farmer	84.7	Small town	82.2		
Housewife	80.8	Medium city	81.4		
Retired	86.0	Large city	79.9		
Student	83.2				
Unemployed	53.6	Total (entire sample)	82.4		

Source: Abacus, Social Barometer, 1996.

Table 9. Willingness to accept longer work commuting times—Italy 1996.

Rural municipality	14.7
Small town	20.9
Medium city	25.6
Large city	23.5

Source: Abacus, Social Barometer, 1996.

Table 10. Percentage of “very” or “enough satisfied” commuters regarding different concerns by commuting time—Italy, 2002 (samples for nine Italian cities).

Commuting time (minutes)	0–5 (19.9)	6–15 (32.9)	16–30 (23.9)	31–60 (14.1)	>60 (4.5)	Variable (4.7)	Total (100.0)
Economic conditions	77.3	73.0	74.7	77.5	82.1	71.3	75.2
Health	90.6	90.6	91.4	90.7	88.6	86.9	90.5
Family relationships	95.7	96.0	96.2	94.2	95.3	93.7	95.6
Friends relationships	95.6	95.6	94.1	95.5	94.6	92.5	95.0
Him/her self	92.3	92.5	90.2	92.4	92.3	93.2	91.9
Leisure	63.1	67.9	67.8	67.3	61.7	64.6	67.8

Source: CATI—University of Milan Bicocca and University of Calabria, MIUR Cofin, Quality of life in the medium sized cities, 2001–2003.

guarantee the individual identity, to improve experience, to generate civiness. Nowadays, such functions are able to be satisfied by a set of cities in which the individuals live and work. In Italy, in particular the strong attachment and identity with the place of origin makes commuting very useful in order to maintain everyday contacts with local communities and, at the same time, to take advantage of resources and opportunities available in the large centers. According to the above presented survey, people also think that the improvement of communication and transport tools is more important (71.2%) than the development of tele-working opportunities (28.8%) for the betterment of quality of life. Moreover, several of them would even accept traveling longer in order to maintain their actual working and residential situation (Table 9).

More recent surveys—performed in 2002 within a research project financed by the Italian Ministry of University and Research (MIUR) and based on nine samples of medium sized cities (7246 cases) located in the metropolitan areas of Turin (Alessandria, Asti, Rivoli), Milan (Monza, Sesto San Giovanni), Naples (Caserta, Torre del Greco) and in a southern conurbation of Italy (Cosenza, Rende)—confirm the above presented data. Different times and means of transport for commuting to work or school do not generate very different levels of satisfaction for several concerns (Table 10). Only satisfaction with health and leisure seem to be slightly lower in comparison with other groups, and leisure is more problematic than other items for all of the groups. Economic condition is even improved by

long-run commuters (>60 minutes) without compromising social relationships. Therefore, commuters earning money in the core of the metropolitan area and living, consuming and paying taxes in their own towns—where the cost of living is often lower—present a privileged condition when compared with other groups, also from a fiscal point of view. For these and other reasons many large cities are considering the idea of charging commuters (Shields and Shideler, 2003) for example, introducing new systems of road pricing. London and Singapore are well known examples. In Italy, the Municipality of Milan was recently considering this option not only for economic reasons but also for reducing traffic and pollution.

To conclude, commuters show a positive perception of their quality of life. Of course data have been controlled for a set of socioeconomic variables (gender, age, education, occupation) in order to avoid misinterpretation linked to the characteristics of the commuters. The differences, however, emerging between short-run and long-run workers or students, excluding a slightly higher percentage of women, youth, un-married, medium educated people and clerks among long-run commuters, are not relevant.

In general, commuters do not have a negative perception about their life as a whole or with any related concerns. Moreover, according to other opinion polls performed at the local level (Piacenza, Catholic University of Milan, 2004) submitting questionnaires through newspaper, show that when workers display an unwillingness to commute it is probably linked to specific activities, working conditions and the life cycle. But in any case this is not absolute. In particular, people at the top of their career and with fewer problems in terms of family and child care are less interested in finding a job closer to their place of residence. Their commuting efforts are probably still compensated by the quality of jobs and opportunities offered by the large city. We do not even know if people who decide to live in the city where they daily work and who therefore stop commuting are any more satisfied overall with their new situation. This applies also for people who find a job in their town of origin and therefore stop commuting.

Conclusion: Commuting in a Turbulent World and Looking for Quality of Life

Many studies confirm that technology could be a complement and not a substitute for face-to-face interaction (Seetharam Sridhar and Varadharajan Sridhar, 2003). The process of suburbanization is therefore often accompanied by the growing of commuting practices especially in the more advanced countries where large cities show a deep transformation due to globalization. The misleading idea, starting from its first signs during the early 1980s, that the diffusion of home electronics and teleworking should generate the “death” of the city and the reduction of mobility is nowadays completely defeated (Martinotti, 1999). It is clear that at least in the medium term, space will continue to matter and cities will continue to act as focal points of economic and social interaction, particularly in Europe (Heidenreich, 1998). We need to be aware of the speed of technological development, and to reflect

on the implications this will have for urban policies, but this is not to say that we need to subscribe to wholly utopian views of the future (e.g., Tofler, 1980). The number of workers and students that commute daily is increasing and many problems are linked to these mobility practices in terms of wasted resources such as money, time, and social capital. Moreover, *New York, September 11, 2002*, *Madrid, March 11, 2004*, and *London, July 7, 2005* are terrible dates for the entire world but especially for the commuters that were and are daily exposed to terrorist attacks. Several other negative situations like improvised strikes, black outs, earthquakes and so on, seem to be more problematic for people that intensively use public transports and that cannot quickly join their family at home or when they want during the day. The perception of the risk linked to mobility practices can contribute to reduce our sense of tranquility and serenity and sometimes a more fatalistic approach is not sufficient to attenuate the state of alert and preoccupation. Italian researchers also point out negative relationships between commuting and health conditions: physical and mental. More precisely, commuting is not the main cause of health diseases but contributes to worsening them (Istituto italiano di medicina sociale and European Foundation for the Improvement of Living and Working Conditions, 1986). Despite these issues, studies also show that commuters, at least in some countries like Italy, are not less satisfied than other people about their life. Public administrators and economic actors are therefore currently dealing with this dilemma: is it better to improve local working opportunities or to focus on public transport connections in order to facilitate commuting practices? Many elements have to be carefully examined in order to define the best strategy. Finally, the overall quality of life of commuters, even if not always deeply explored, seems to be a crucial variable in this frame. Commuting is not a *self-centered* system but has to be analyzed and planned also in connection with social and environmental aspects, taking into account that “sustainable commuting” is not a contradiction in terms (Banister and Gallent, 2004).

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An Alternative Measure of Years of Healthy Life*

ALEXANDRE KLEMENTIEV

Introduction

An increase in life expectancy is traditionally considered to be an improvement in the health of a population. This is not necessarily true, however, because longer life expectancy can be achieved by prolonging the lives of those with disabling illnesses. Because of this, quality of life in addition to length, has become an important population health issue. Different measures of quality of life have been developed for evaluating and tracking population health, as well as for identifying health disparities (Murray *et al.*, 2000). Among these measures is the Years of Healthy Life¹ (YHL)—a summary index that combines Health-Related Quality of Life (HRQOL) data and mortality into a single measure of population health. At the national level, the National Health Interview Survey (NHIS) provides HRQOL data to permit the calculation of YHL (Molla *et al.*, 2001).

At the local level YHL measures have been infrequently reported. The main barrier to their estimation is the lack of availability of local area surveys focused on the health status of the population of interest. To fill this gap, alternative measures of YHL based on responses to the Behavioral Risk Factor Surveillance System (BRFSS) “Health Status” module can be used. The method for calculating these alternative measures of YHL is discussed in this study. The alternative measures are designed to reflect in one aggregated index the physical health, or mental health, or general health of a population of interest.

YHL was developed for the Healthy People national prevention initiatives to monitor progress for Healthy People 2000, and is also being used in Healthy People 2010² for summarizing the effects of changing health status and mortality conditions in the U.S. population. In general, YHL can be used for identifying health

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disparities and for tracking population health, in addition to the *Healthy Days* measures, which were also designed for this purpose (Moriarty *et al.*, 2003).

Estimate of Years of Healthy Life

Definition of YHL is based on two main components, survival and HRQOL (Erickson *et al.*, 1995). Survival is determined by the total numbers of years lived by a cohort in the Life Table population in each age interval. HRQOL is represented by people's perceptions of their physical and mental health. These perceptions are expressed in the responses to three questions³ in the BRFSS "Health Status" module. The responses are the basis for calculating the weights u_j that are used in the definition of YHL. For the youngest age in the α -th age interval YHL is defined as

$$Y_\alpha = (1/\ell_\alpha) \sum_{j=\alpha}^w u_j L_j = (1/\ell_\alpha) \sum u_j n_j [\ell_{j+1} + a_j (\ell_j - \ell_{j+1})] \quad (1)$$

where

ℓ_α – number alive at exact age x_α (x_α is the youngest age in the age interval α) in the Life Table population, $0 \leq \alpha \leq w$;

$w+1$ – number of age intervals;

u_j – weight representing rate of being healthy in the j -th age interval;

L_j – total number of years lived by a cohort in the Life Table population in the j -th age interval;

n_j – length of the j -th age interval;

a_j – average fraction of age interval (x_j, x_{j+1}) lived by an individual dying at an age included in the age interval (x_j, x_{j+1}).

Values of u_j characterize different levels of HRQOL. Depending on what aspect of population health is considered, the weight u_j can be the function of self-estimate of either physical health, mental health, or both. For physical health, for example, the value 0 means that, within the last 30-day period, impaired physical health was reported for all 30 days. The value 1 corresponds to optimal physical health. This means that no days of impaired physical health were reported within the past 30 days.

Physical Health

Let $h_j(i)$ be the response to the physically unhealthy days BRFSS question Q2.³ This i -th response relates to a person from the age interval j . There are R_j respondents in the age interval j . By definition,

$$0 \leq h_j(i) \leq 30, i = 1, 2, \dots, R_j. \quad (2)$$

Now let

$$u_j(i) = (30 - h_j(i))/30 \quad (3)$$

be defined as the *individual weight* of the i -th response from the age interval j . Notice that $0 \leq u_j(i) \leq 1$ because of (2) and (3). The weight u_j is the average of the individual weights $u_j(i)$ within a given age interval j :

$$u_j = \sum_{i=1}^{R_j} u_j(i)/R_j. \quad (4)$$

The weight u_j defined in (3) and (4) is interpreted as the average proportion of days during the past 30 days when physical health was believed to be at least good for people in the age interval j . The YHL measure calculated according to (3), (4), and (1) is called the *Physical Health Index* (PHI).

Mental Health

The weight u_j for mental health is defined similarly to (3). Let $m_j(i)$ be the response to the mentally unhealthy days BRFSS question Q3. Individual weight $u_j(i)$ corresponding to mental health is defined as

$$u_j(i) = (30 - m_j(i))/30. \quad (5)$$

The weight u_j defined according to (4) and (5) represents the average proportion of days during the past 30 days when mental health was believed to be at least good for people in the age interval j . YHL measure calculated according to (5), (4), and (1) is called the *Mental Health Index* (MHI).

Accounting for Both Physical and Mental Health

When both physical and mental health are accounted for, the following function $b_j(i)$ is used for definition of the weights

$$b_j(i) = \begin{cases} h_j(i) + m_j(i), & \text{if } h_j(i) + m_j(i) < 30, \\ \text{or} \\ 30, & \text{if } h_j(i) + m_j(i) > 30. \end{cases} \quad (6)$$

Truncating function $b_j(i)$ is interpreted as the number of days during the past 30 days when both physical and mental health for the i -th respondent from the j -th age interval were believed to be at least good. Physically and mentally unhealthy days are assumed to be not overlapping. So, $b_j(i)$ represents the lower bound of the estimated average of recent days when both physical and mental health were believed to be at least good and when the total days are restricted to a respondent maximum of 30 days. Individual weight for this case is

$$u_j(i) = (30 - b_j(i))/30. \quad (7)$$

When the weights are defined as in (7) and (4), YHL measure from (1) is called the *Health Index* (HI).

Table 1. Categories of the behavioral risk factor surveillance system variable “General Health” and binary variable $g_j(i)$.

GH Category	GH Value	Value $g_j(i)$
Excellent	1	1
Very good	2	1
Good	3	1
Fair	4	0
Poor	5	0

General Health

The variable “General Health” (GH) in the BRFSS “Health Status” module is characterized by five categories whose values are shown in column “GH Value” in Table 1.

Let a new binary variable $g_j(i)$ be related to the i -th response of a person from the age interval j

$$g_j(i) = \begin{cases} 1, & \text{if GH is “Excellent,” or “Very good,” or “Good,”} \\ \text{or} & \\ 0, & \text{if GH if “Fair,” or “Poor,”} \end{cases}$$

Let the weight u_j be defined as the proportion of responses with “Excellent,” or “Very good,” or “Good” general health with a given age interval j as⁴

$$u_j = \sum_{i=1}^{R_j} g_j(i) / R_j. \quad (8)$$

YHL measure calculated according to (8) is called the *General Health Index* (GHI).

Confidence Interval for Estimated Years of Healthy Life

Since both u_j and L_j ($j = \alpha, \dots, w$) in (1) are random in nature, Y_α must also be considered to be a random variable. Let the expected values of weight and probability of surviving in the age interval j be denoted as u'_j and p'_j , respectively. So, the expected values of the arguments of Y_α are $u'_\alpha, \dots, u'_w, p'_\alpha, \dots, p'_w$. For short, let them be denoted as

$$p'(\alpha) = p'_\alpha, \dots, p'_w, \text{ and,}$$

$$u'(\alpha) = u'_\alpha, \dots, u'_w.$$

Taylor Series Expansion of the YHL Estimate

To find the variance of Y_α consider a Taylor-series expansion of Y_α about the expected values $p'(\alpha), u'(\alpha)$. Holding the linear part of the expansion we have

$$Y_\alpha = YI_\alpha + \sum_{j=\alpha}^w [\partial Y_\alpha(p'(\alpha), u'(\alpha)) / \partial u_j] (u_j - u'_j)$$

$$\begin{aligned}
 & + \sum_{j=\alpha}^w [\partial Y_\alpha(p'(\alpha), u'(\alpha))/\partial p_j] (p_j - p'_j) \\
 & = Y1_\alpha + Y2_\alpha + Y3_\alpha.
 \end{aligned} \tag{9}$$

The first term in (9) has a constant value $Y1_\alpha = Y_\alpha(p'_\alpha, \dots, p'_w, u'_\alpha, \dots, u'_w)$. The second term in (9) can be rewritten as

$$\begin{aligned}
 Y2_\alpha & = \sum_{j=\alpha}^w [\partial Y_\alpha(p'(\alpha), u'(\alpha))/\partial u_j] (u_j - u'_j) \\
 & = (1/\ell_\alpha) \sum_{j=\alpha}^w L_j(p'_\alpha, \dots, p'_w) (u_j - u'_j).
 \end{aligned}$$

Transforming Formula for YHL

Before considering the third term in (9) we need to transform expression (1) as follows⁵

$$\begin{aligned}
 Y_\alpha & = (1/\ell_\alpha) \sum_{j=\alpha}^w u_j L_j = (1/\ell_\alpha) \left[\sum_{j=\alpha}^{w-1} u_j \{n_j \ell_{j+1} + a_j n_j (\ell_j - \ell_{j+1})\} + a_w n_w d_w \right] \\
 & = (1/\ell_\alpha) [u_\alpha a_\alpha n_\alpha \ell_\alpha + \sum_{j=\alpha+1}^w u_j \{(1 - a_{j-1})n_{j-1} + a_j n_j\} \ell_j] \\
 & = a_\alpha n^* \alpha + \sum_{j=\alpha+1}^w c_j^* P_{\alpha j},
 \end{aligned} \tag{10}$$

where a_j , d_w , n_k^* and c_j^* are defined as following. a_j is the average fraction of age interval (x_j, x_{j+1}) lived by an individual dying at an age included in the age interval (x_j, x_{j+1}) :

$$\begin{aligned}
 a_j & = [1/(\ell_j - \ell_{j+1})n_j] \int_{x_j}^{x_{j+1}} [\ell(x) - \ell_{j+1}] dx, \\
 d_w & \text{ is the number dying in the age interval } w; \\
 n_k^* & = u_k n_k, \text{ and} \\
 c_j^* & = (1 - a_{j-1})n_{j-1}^* + a_j n_j^*, j = \alpha + 1, \dots, w
 \end{aligned} \tag{11}$$

and the proportion surviving in the age interval (x_α, x_j) is

$$p_{\alpha j} = \ell_j/\ell_\alpha = (\ell_j/\ell_{j-1}) \dots (\ell_{\alpha+1}/\ell_\alpha) = p_{j-1} p_{j-2} \dots p_\alpha.$$

Evidently,

$$\partial p_{\alpha j} / \partial p_i = \begin{cases} p_{\alpha j} p_{j+1, j} & \text{if } \alpha \leq i \leq j, \\ 0, & \text{otherwise} \end{cases} \tag{12}$$

With (10), (11), and (12) accounted for, the partial derivative in the third term in (9) can be rewritten as

$$\begin{aligned}\partial Y_\alpha / \partial p_i &= \partial / \partial p_i \left[a_i n_\alpha^* + \sum_{j=\alpha}^w c_j^* p_{\alpha j} \right] = \sum_{j=i+1}^w c_j^* p_{\alpha i+1, j} \\ &= p_{\alpha i} \left[c_{i+1}^* + \sum_{j=i+2}^w c_j^* p_{i+1, j} \right].\end{aligned}\quad (13)$$

It follows from (10) that

$$Y_{i+1} = a_{i+1} n_{i+1}^* + \sum_{j=i+2}^w c_j^* p_{i+1, j}.$$

Taking the last expression and (11) into account we can rewrite (13) as

$$\partial Y_\alpha / \partial p_i = p_{\alpha i} [(1 - a_j) n_j^* + Y_{i+1}]. \quad (14)$$

The estimated probabilities p_i of surviving in the age intervals i are not correlated since they are estimated for non-overlapping age intervals and therefore are related to distinct groups of people. For the same reason, the weights u_i are not correlated with each other. Now we can write the following formula for the variance of Y_α

$$\begin{aligned}S^2(Y_\alpha) &= \sum_{i=\alpha}^w [\partial Y_\alpha(p'(\alpha), u'(\alpha)) / \partial u_i]^2 S^2(u_i) + \sum_{i=\alpha}^w [\partial Y_\alpha(p'(\alpha), u'(\alpha)) / \partial p_i]^2 S^2(p_i) \\ &= \sum_{i=\alpha}^w [L_i^2 S^2(u_i)] / \ell_\alpha^2 + \sum_{i=\alpha}^{w-1} p_{\alpha i}^2 [(1 - a_i) n_i^* + Y_{i+1}]^2 S^2(p_i) = S_u^2(Y_\alpha) + S_p^2(Y_\alpha).\end{aligned}\quad (15)$$

The variances $S^2(u_i)$ of the weights⁶ u_i calculated from the BRFS data and defined above are computed within the BRFS data processing procedure in the same way as it is done for any other variable.

Accounting for Sampling Error if Self Estimates of Health are from a Simple Random Sampling⁷

In a special case when the weights u_j are defined as binomial proportions and calculated from a simple random sampling, their variances $S^2(u_j)$ can be calculated from

$$S^2(u_j) = u_j(1 - u_j) / R_j, \quad i = 0, \dots, w. \quad (16)$$

where R_j is the number of persons in the j -th age interval of the sample. In this special case the first term in (15) can be defined as

$$S_u^2(Y_\alpha) = \sum_{i=\alpha}^w L_i^2 S^2(u_i) / \ell_\alpha^2 = \sum_{i=\alpha}^w L_i^2 u_i (1 - u_i) / R_j / \ell_\alpha^2 \quad (17)$$

Summand of YHL Variance Stipulated by the Random Nature of Death Occurrence

To calculate $S^2(p_i)$ in the second term in (15) notice that the sample variance of p_i is the same as the variance of probability of dying in the i -th age interval:

$S^2(p_i) = S^2(q_i)$. The sample variance of q_i is:

$$S^2(q_i) = q_i^2 (1 - q_i)/D_i, \quad (18)$$

where D_i is the number of dying in the i -th age interval and probability q_i of dying in this age interval is calculated according to

$$q_i = n_i M_i / [(1 + (1 - a_i)n_i M_i)], \quad (19)$$

where M_i stands for mortality rate in the age interval i (Chiang, 1969, p. 211). Now (15) can be rewritten as

$$S^2(Y_\alpha) = S_u^2(Y_\alpha) + S_a^2(Y_\alpha) = S_u^2(Y_\alpha) + (1/\ell_\alpha^2) \sum_{i=\alpha}^w H_i, \quad (20)$$

where

$$H_i = \ell_i^2 [(1 - a_i)n_i^* + Y_{i+1}]^2 S^2(q_i).$$

The following formulas are used for calculating Y_α :

Average fraction of the i -th age interval lived by an individual dying at an age included in this age interval is

$$a_i = a_i^*/n_i, \quad (21)$$

where a_i^* is the average number of years lived in the i -th age interval by those who died in this age interval. Age-specific death rate is calculated for the i -th age interval as the number of deaths within a year divided by the population in this age interval:

$$M_i = D_i / \text{Pop}_i. \quad (22)$$

The number alive at exact age x_i (so that x_i is the youngest age in the i -th age interval) is defined as

$$\ell_i = \begin{cases} 100,000, & \text{if } i = 0 \\ \text{or} \\ \ell_{j-1} (1 - q_{j-1}), & \text{if } i = 1, \dots, w. \end{cases} \quad (23)$$

Total number of years lived by a cohort in the Life Table population in the i -th age interval is

$$L_i = n_i \ell_{i+1} + a_i n_i (\ell_i - \ell_{i+1}). \quad (24)$$

Similarly, total number of healthy years lived by a cohort in the Life Table population in the i -th age interval is

$$L_i^* = n_i^* \ell_{i+1} + a_i n_i^* (\ell_i - \ell_{i+1}). \quad (25)$$

Standard error of the observed YHL is calculated from

$$S.E.(Y_\alpha) = \sqrt{[S_u^2(Y_\alpha) + S_q^2(Y_\alpha)]}, \quad (26)$$

where $S_u^2(Y_\alpha) + S_q^2(Y_\alpha)$ is found from (20).

If it is assumed that Y_α is normally distributed and its estimated value for a given age α is equal to Y_α^{ob} , the lower bound (LB) and upper bound (UB) of the 95% confidence interval for Y_α are defined as

$$LB = Y_\alpha^{ob} - 1.96 S.E.(Y_\alpha^{ob}), \tag{27}$$

$$UB = Y_\alpha^{ob} + 1.96 S.E.(Y_\alpha^{ob}), \tag{28}$$

where $S.E.(Y_\alpha^{ob})$ is calculated from (26).

Results

Three forms if YHL, *Physical Health Index* (PHI), *Mental Health Index* (MHI), and *General Health Index* (GHI) were calculated for the Pierce County population for each of four periods: 1993–1996, 1997–1999, 2000, and 2001–2002. The weights were computed from BRFSS, so the youngest available age was 18 years. The indexes PHI, MHI, and GHI represent different aspects of population health measured in years of healthy life.

Dynamics of Years of Healthy Life

Results of calculation of PHI and life expectancy (LE) for 18-year-olds and for 65-year-olds in Pierce County are shown on Figures 1 and 2 where both point

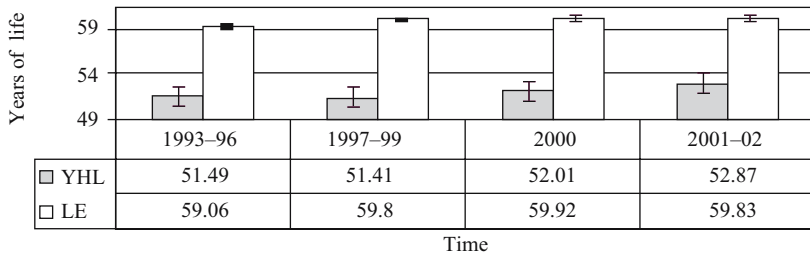


Fig. 1. Physical health index and life expectancy for 18-year-olds: Pierce County, 1993–2002.

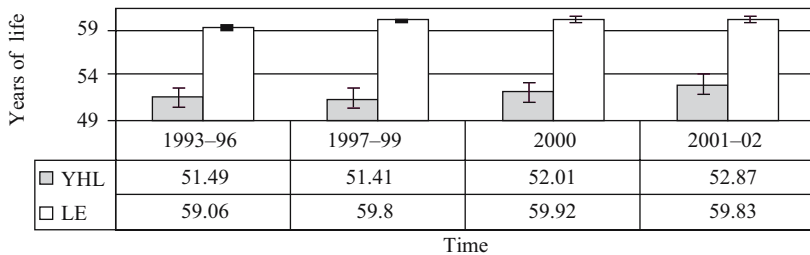


Fig. 2. Physical health index and life expectancy for 65-year-olds: Pierce County, 1993–2002.

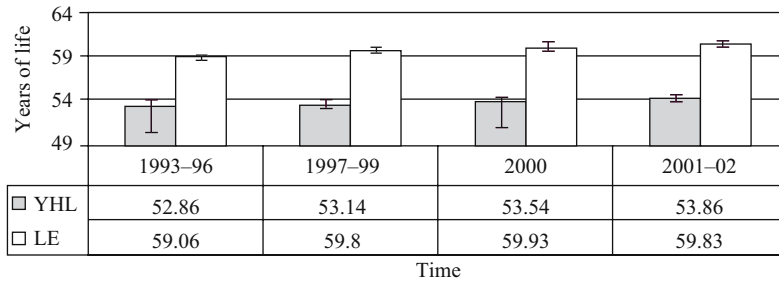


Fig. 3. Mental health index and life expectancy for 18-year-olds: Pierce County, 1993-2002.

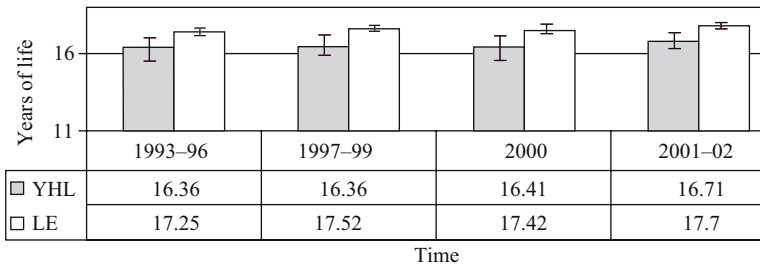


Fig. 4. Mental health index and life expectancy for 65-year-olds: Pierce County, 1993-2002.

estimates and confidence intervals of YHL and LE are presented. PHI increased for 18-year-olds by 1.4 year from 51.5 years in the period 1993-1996 to 52.9 years in 2001-2002. At the same time, life expectancy for 18-year-olds grew only by 0.8 year. An increase of PHI for 65-year-olds was about 0.8 year whereas life expectancy for this age grew only by 0.45 year in the same period. This means that for both 18 and 65-year-olds about half of the PHI growth was due to the improvement of physical health in the Pierce County population.

The growth of PHI at age 18 was not statistically significant. This means that the observed differences in PHI might be due to the random nature of the YHL measures. The same is true for the PHI estimate at age 65. The dynamics of mental health of the 18 and 65-year-olds in Pierce County represented by the MHI estimate is demonstrated on Figures 3 and 4 along with the corresponding LE figures. MHI increased for 18-year-olds by 1 year from 52.9 years in the period 1993-1996 to 53.9 years in 2001-2002.

At the same time life expectancy of 18-year-olds grew by 0.8 year. For 65-year-olds an increase of MHI was about 0.35 year whereas for this age grew by 0.45 year in the same period. The growth of MHI was mostly attributable to the increase of life expectancy for the 65-year-olds. Mental health was worsening for 65-year-olds: the increase in MHI (0.35 year) was lower than the increase in life expectancy (0.45 year). GHI and LE for 65-year-olds and for 65-year-olds are shown on Figures 5 and 6.

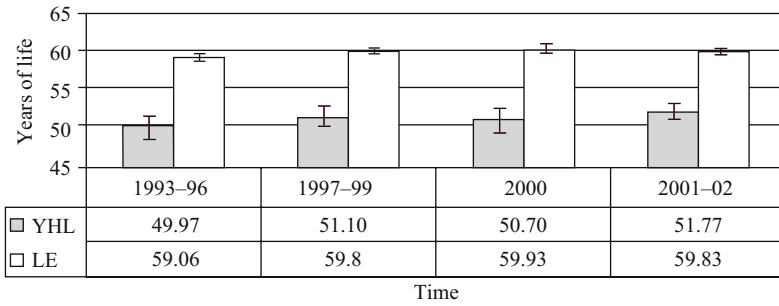


Fig. 5. General health index and life expectancy for 18-year-olds: Pierce County, 1993–2002.

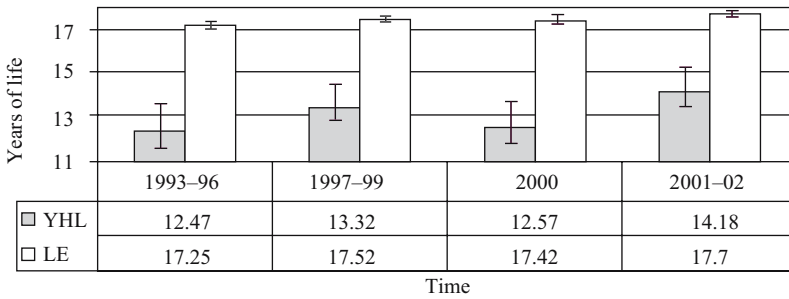


Fig. 6. General health index and life expectancy for 65-year-olds: Pierce County, 1993–2002.

As it follows from the definition of GHI, it is independent of PHI and MHI and the estimates of GHI presented on Figures 1–4 are not directly related to the estimates on Figures 5 and 6. GHI for 65-year-olds grew by 1.8 year, from 50.0 years in 1993–1996 to 51.8 year in 2001–2002. The growth is essentially due to the improvement of health of those who were 18 years of age and older. Increase of GHI at the age 65 from 12.5 to 14.2 was noticeable but not statistically significant.

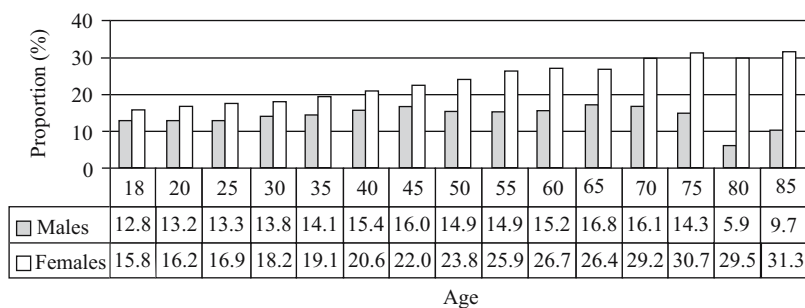
Years of Healthy Life by Gender

Estimates of YHL measured with the GHI are presented in Table 2 for males and females 18-years-old and older. Notations “95% CI for YHL” and “95% CI for LE” in Table 2 stand for the 95% confidence intervals for the YHL and LE estimates, respectively.

Eighteen-year-old females can expect to live 4.7 years longer life than males (Table 2): 62.2 vs. 57.5 years. Out of 62.2 expected years of life these females would spend $62.2 - 52.4 = 9.8$ years in “poor health,” 15.8% of their LE. On the other hand, 18-year-old males would spend 7.4 years in “poor health,” 12.8% of

Table 2. Years of healthy life estimated with general health index, by gender: Pierce County, 2000–2002.

	Age							
	18	25	35	45	55	65	75	85
Males								
YHL	50.1	44.1	35.6	27.0	20.1	13.2	8.5	5.1
95% CI for YHL	(48.7–51.5)	(42.8–45.5)	(34.3–36.9)	(25.7–28.3)	(18.9–21.3)	(12.1–14.3)	(7.6–9.5)	(3.9–6.4)
LE	57.5	50.9	41.4	32.2	23.6	15.9	10.0	5.7
95% CI for LE	(57.2–57.7)	(50.7–51.2)	(41.2–41.7)	(31.9–32.4)	(23.4–23.8)	(15.7–16.1)	(9.8–10.1)	N/A
Females								
YHL	52.4	46.0	36.9	28.3	20.2	14.0	8.4	4.8
95% CI for YHL	(50.9–53.8)	(44.6–47.4)	(35.6–38.3)	(26.9–29.6)	(18.9–21.5)	(12.9–15.2)	(7.3–9.5)	(3.3–6.2)
LE	62.2	55.3	45.7	36.2	27.3	19.1	12.1	6.9
95% CI for LE	(61.9–62.4)	(55.1–55.6)	(45.4–45.9)	(36.0–36.4)	(27.1–27.5)	(18.9–19.3)	(11.9–12.2)	N/A

**Fig. 7.** Proportion of “poor health” in future life for 18+ year old, Pierce County, 2000–2002.

their LE. The proportions of life expectancy spent in “poor health” are presented in Figure 7 for Pierce County males and females, 2000–2002.

In every age interval males can expect that a lower portion of their future life will be spent in “poor health” than females. In the female population the portion of future life spent in “poor health” differs noticeably with age from 15.8% at age 18 to 29.2% at age 70. On the other hand, this portion in men is only slightly growing with age and fluctuating between 12.8% and 16.1% over the same age interval. So, relative worsening of general health with age is more evident in the female population. At about age 65 the portion of “poor health” in future life stabilizes at about 30% in the female population. This portion, decreasing significantly after age 70 in men.

The portion of “poor health” in future life might serve as an illustration for the expression “golden age”: women feel that their general health is not worsening after the age 65, and men feel that their general health is noticeably better than it was before. Two hypotheses can be explored to explain this counterintuitive observation. On the one hand, most 65+ people are retired and they are not under daily

stress of work anymore, which makes their life subjectively healthier. On the other hand, those who reported that their general health was “fair” or “poor” simply died out before the age of mid sixties.

Two Factors Contributing into the Resulting Error of the YHL Estimates

Since sample survey data are used in deriving YHL, there is a factor of uncertainty in the estimated YHL figures. Another factor of uncertainty in the YHL estimates is the random nature of death occurrence. The component of variance attributable to the random nature of death occurrence (Var_2) was always lower than the component of variance attributable to sampling error (Var_1) in all age intervals. The ratio Var_2/Var_1 was usually under 0.1. However for some indexes it was higher than 0.15. For example, for MHI the ratio was 0.17 for the age interval 65–70.

One can see from Table 4 that the contribution of sampling error Var_1 into the variance of YHL is about two orders of magnitude higher than the contribution of the random nature of death occurrence Var_2 . For example, for the age interval 18–19 $Var_1 = 0.545$ and $Var_2 = 0.0088$. In cases like this, when calculating confidence interval for YHL the component Var_2 can be neglected. The case when the random nature of death occurrence can be neglected was considered in (Molla *et al.*, 2001) where the formula offered for YHL variance is the same as (17). Calculations show that when the population under study is several hundred thousand or less, the difference between Var_1 and Var_2 may not be negligible, and therefore formula (20) must be used instead of the simplified formula (17).

Formula (17) for Var_1 is developed for the case when the weights are binary proportions. When the weights are continuous variables, like in PHI calculating, the formula (17) is not valid and formula (20) must be used for the direct estimate of the variance.

Limitations

BRFSS data do not cover ages 0–17. This means that YHL at birth or at any other age younger than 18 can not be calculated when the BRFSS data are used for calculating HRQOL measures.

Another type of limitations in using BRFSS data for estimating YHL result from the BRFSS protocol, which does not cover the institutionalized population, that is, persons in hospitals, nursing homes, and jails. Estimates would be lower if the disabled population in institutions were included, even though institutionalized elderly people are a small proportion of the total population. In addition, people who live in households without telephones are not included in the survey. This undercoverage can cause overestimation of YHL. It was pointed out, however, that the overestimation could not be significant, and this is how it was explained in (Buescher and Gizlice, 2002):

“... BRFSS does not cover the institutionalized population, ... where health problems are likely to be greater. ... From the 2000 Census, we

determined that approximately 5 percent of persons in North Carolina age 65 and older reside in institutions. . . . If we assume that all of these persons age 65 and older in institutions would report their health as 'fair' or 'poor', then the proportion of persons where perceived health status is good would be reduced. . . . When these revised figures are entered into the calculation of healthy life expectancy at birth, the original estimate of 63.0 is reduced to 62.6. So the effect of leaving out the institutionalized population from the estimates presented in this report is not large."

Fractions of last year of life, a_i , are required as inputs for calculating both life expectancy (LE) and YHL. This means that additional calculations must be carried out to produce a_i for LE and YHL estimation. These additional calculations usually require counts of deaths by the interval of days lived in the last year of life. Statistical methods for calculating a_i are described, for example, in (Chiang, 1969).¹⁰

Another way to estimate a_i is to use the Keyfitz iterative procedure (Keyfitz and Flieger, 1971) for Life Table calculation. The advantage of the Keyfitz procedure is that it allows one to estimate a_i from the available mortality data.

Conclusion

Health status of residents of Pierce County, WA, was evaluated in this paper. Evaluation was based on the Years of Healthy Life measure that combines mortality and self-estimated morbidity in one metric. In public health YHL can be used for assessment of whether an increase in life expectancy is accompanied with compression or expansion of good health.

YHL is able to measure health effects that cannot be assessed using measures of mortality or morbidity individually. For example, the recent steady increase in life expectancy in Pierce County appears to be accompanied by generally improved both physical and mental health status among the Pierce County adults. Calculations show that in absolute terms, 18+ years old women live longer life than men and their YHL estimates are higher. However, while women live longer, their quality of life is not proportionally better. Adult women spend higher proportion of their remaining years with "fair" or "poor" health. This message cannot be captured by any other single population health indicator.

The method discussed in this paper can be applied to any population for which both death rates and age-specific measures of HRQOL are available for the same age categories. The method is not limited to the measures of HRQOL based on BRFSS data.

Appendix

The essential steps in the calculation of the point estimates and confidence intervals of YHL are illustrated in Table 3 and Table 4. Input data for the calculations shown in TABLE 3 represent population (column *D2*) and death counts (column *E2*) of adults in Pierce County, WA, in 2001–2002. The weights (column *F2*) were

Table 3. Input data and calculated life table functions: Pierce County, 2001–2002.

Age interval i	n_i	a_i	Pop_i	D_i	u_i	R_i	$S^2(u_i)$	M_i	q_i	l_i	L_i	e_i
$A2$	$B2$	$C2$	$D2$	$E2$	$F2$	$G2$	$H2$	$I2$	$J2$	$K2$	$L2$	$M2$
18–19	2	2.71	43484	34	0.9538	N/A	0.00220	0.0008	0.00156	98949	197756	59.83
20–24	5	2.59	101055	76	0.8967	N/A	0.00175	0.0008	0.00375	98794	493076	57.92
25–29	5	2.54	94214	84	0.9279	N/A	0.00072	0.0009	0.00445	98423	491039	53.13
30–34	5	2.6	109000	102	0.8908	N/A	0.00094	0.0009	0.00467	97985	488829	48.36
35–39	5	2.67	116175	156	0.9596	N/A	0.00035	0.0013	0.00669	97528	486132	43.57
40–44	5	2.71	119766	258	0.8756	N/A	0.00109	0.0022	0.01072	96875	481998	38.85
45–49	5	2.67	106837	383	0.8880	N/A	0.00092	0.0036	0.01778	95837	475215	34.24
50–54	5	2.66	93352	482	0.8729	N/A	0.00150	0.0052	0.02551	94133	465048	29.81
55–59	5	2.69	70693	555	0.8185	N/A	0.00265	0.0079	0.03856	91732	450491	25.52
60–64	5	2.65	51070	662	0.8011	N/A	0.00290	0.0130	0.06290	88195	427941	21.44
65–69	5	2.65	41577	801	0.8182	N/A	0.00381	0.0193	0.09216	82648	395342	17.70
70–74	5	2.62	35967	1155	0.8225	N/A	0.00384	0.0321	0.14916	75032	348521	14.23
75–79	5	2.57	29944	1480	0.7275	N/A	0.00566	0.0494	0.22063	63840	284972	11.26
80–84	5	2.75	21611	1630	0.8721	N/A	0.00531	0.0754	0.32241	49755	212681	8.72
85+	5	6.56	17756	2708	0.7657	N/A	0.01495	0.1525	1.00000	33713	221160	6.56

Table 4. Calculating confidence interval of years of healthy life: Pierce County, 2001–2002.

Age interval i	$u_i^*L_i$	$L_i^2S^2(u_i)$	Var_1	S_{ai}^2	n_i^*	H_i	Var_2	$S.E.$	Y_i	LB	UB
	$N3$	$O3$	$P3$	$Q3$	$R3$	$S3$	$T3$	$U3$	$V3$	$W3$	$X3$
18–19	188619	86204294	0.545	7.2	1.91	1812646	0.0088	0.7444	51.77	50.31	53.22
20–24	442142	424918434	0.538	18.5	4.48	4117594	0.0087	0.7395	49.94	48.49	51.39
25–29	455635	173401240	0.498	23.5	4.64	4292560	0.0083	0.7119	45.63	44.29	47.03
30–34	435449	223543583	0.485	21.3	4.45	3114178	0.0079	0.7020	41.19	39.81	42.56
35–39	466492	83222778	0.466	28.5	4.80	3241701	0.0077	0.6882	36.92	35.57	38.26
40–44	422038	253113811	0.46	44.0	4.38	3795465	0.0074	0.6861	32.35	31.00	33.69
45–49	421991	207951873	0.446	81.0	4.44	5184959	0.0072	0.6731	28.30	26.98	29.61
50–54	405940	324192180	0.439	131.5	4.36	5942492	0.0069	0.6675	24.32	23.02	25.63
55–59	368727	538327539	0.423	257.5	4.09	7879811	0.0060	0.6557	20.54	19.25	21.82
60–64	342823	530462574	0.389	560.0	4.01	112434936	0.0060	0.6284	17.18	15.95	18.41
65–69	323469	596156756	0.365	962.5	4.09	11517299	0.0052	0.6086	14.18	12.99	15.38
70–74	286659	466709152	0.337	1639.0	4.11	10689242	0.0043	0.5843	11.31	10.17	12.46
75–79	207317	459973875	0.351	2563.4	3.64	8273612	0.0033	0.5954	8.81	7.64	9.97
80–84	185479	240251590	0.392	4321.1	4.36	5219422	0.0021	0.6281	7.13	5.90	8.36
85+	169342	731209390	0.643	0.0	3.83	0	0.0000	0.802	5.02	3.45	6.60

calculated from the BRFSS for the category “General health.” The steps in the calculation of the point estimates and confidence intervals for YHL are following:

1. Designate j -th age interval in column $A2$ in the Table 3, so that the youngest age is x_j . Record the length of j -th age interval and the fraction of last age interval of life into the columns $B2$ and $C2$, respectively. Record population counts and number of deaths into the columns $D2$ and $E2$, respectively.
- 2a. Calculate the weights u_j and their variances $S^2(u_j)$ and record them into columns $F2$ and $H2$.
- 2b. In a special case when the weights u_j are defined as binomial proportions and calculated from a simple random sampling, the variances $S^2(u_j)$ can be estimated from formula (16). In this case record the weights u_j and the number of responses R_j in each age interval into columns $F2$ and $G2$, respectively. Compute the variance of weight from (16) and record result into column $H2$.¹¹
3. Compute age-specific death rate from (22) and record it in column $I2$.
4. Compute proportion of dying from (19) and record it in column $J2$.
5. Compute number alive at exact age x_j from (23) and enter it into column $K2$.
6. Compute total number of years lived by a cohort in the Life Table population L_i from (24) and record it into column $L2$. With the use of already available L_i and L_i , life expectancy e_i (column $M2$) can be calculated for the analysis if needed, though e_i is not required for the YHL computation.
7. Compute weighted number of years $u_i L_i$ (total number of healthy years lived in the i -th age interval) and record it into column $N3$, Table 4.
8. Sum the number of healthy years lived by a cohort (column $N3$) from the bottom of the table up to a given age interval i and divide the result by l_i taken from the column $K2$, Table 3. Record the result Y_i (YHL for the youngest age in the i -th age interval) into column $V3$.
9. Compute the quantity $L_i^2 S_i^2$ from columns $L2$ and $H2$ and record result into column $O3$.
10. Sum the numbers in column $O3$ from the bottom of the table up to a given age interval i and divide the result by l_i taken from the column $K2$, Table 3. Record the result into column $P3$. The result Var_1 is the summand of YHL variance stipulated by the sampling error.
11. Compute variance of q_i from (18) and record it into column $Q3$ (notice the quantity in $Q3$ is multiplied by 10^8 in the example in Table 4).
12. Compute the quantity $n_i^* = u_i n_i$ from $B2$ and $F2$ and record it in column $R3$.
13. Compute the quantity H_i from (20) and record it in column $S3$.
14. Sum the values in $S3$ from the bottom of the table up to a given age interval i and divide the result by l_i taken from the column $K2$, Table 3. Record result into column $T3$. The result Var_2 is the summand of YHL variance stipulated by the random nature of deaths occurrence.
15. For each age interval sum the quantities from $P3$ and $T3$. Take square root from the sum and record the result into column $U3$. The calculated value is the standard error of the YHL estimate shown in $V3$.
16. Compute the lower and upper bounds of the 95% confidence interval from (27) and (28). Record the result into columns $W3$ and $X3$, respectively.

Notes

1. One form of a Health Expectancy or Healthy Life Expectancy measure. Detailed interpretation of YHL is given in (Molla *et al.*, 2001).
2. “Healthy People 2010 contains broad-reaching national health goals for the new decade, focusing on two major themes: increasing the quality and years of healthy life, and the elimination of racial and ethnic disparities in health status” (USDHHS, 2000). Also, “North Carolina Governor James B. Hunt made increasing the span of healthy life of the citizens of North Carolina the first of the state’s 2010 Health Objectives with his executive order No.147” (Buescher and Gizlice, 2002).
3. Question Q1: “*Would you say that in general your health is: Excellent/Very good/Good/Fair/Poor?*”
 Question Q2: “*Now thinking about your physical health, which includes physical illness and injury, for how many days during the past 30 days was your physical health not good?*”
 Question Q3: “*Now thinking about your mental health, which includes stress, depression, and problems with emotions, for how many days during the past 30 days was your mental health not good?*”
4. A more comprehensive method accounting for both activity limitation and perceived health status in definition of the weights u_i is considered in (Erickson *et al.*, 1995).
5. A detailed technique of this type of transformation can be found in (Chiang, 1969).
6. For example, the *Physical Health Index* defined in (3) and (4).
7. This special case is considered in (Molla *et al.*, 2001).
8. In the special case when the weights u_i are computed from a simple random sampling, the component $S_u^2(Y_\alpha)$ can be calculated directly from:

$$S_u^2(Y_\alpha) = (1/\ell_\alpha^2) \sum [L_i^2 u_i (1 - u_i) / R_i].$$

9. “Poor health” corresponds the General Health categories “Fair” and “Poor.”
10. By definition, the value of a_w calculated in this study for the last age interval means the average life span of those individuals who are 85 years old or older.
11. Calculations pertaining to this special case are not presented in Table 3 and Table 4, so the entries in column $G2$ are marked as N/A.

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Analyzing “Sustainable Wealth” Indicators for Evaluating the Contribution of a Regional Industrial Sector Toward Quality of Life and Sustainable Development

MARTINA SCHÄFER AND LYDIA ILLGE

1. Introduction

Particularly since national governments are step by step privatizing some of their traditional fields of action related to public welfare (e.g., health, education), stakeholders are calling for business to become an “active positive force” in contributing toward social and ecological development goals instead of simply “doing less harm” to society and the environment (Warhurst, 2005). For instance, a survey of public opinion in 21 countries showed that most people agree that large companies should do more than give money to solve social problems (Enviro-nics, 2003). At the same time, many businesses seem to be aware of the role that they are expected to take. For instance, according to a survey conducted in the United States, 53% of the enterprises believe that the public expects them to contribute time and money toward community needs and to be involved in solving social problems (Center for Corporate Citizenship at Boston College and U.S. Chamber of Commerce, 2004).

Discussions about business activities related to society and the environment include those about “corporate social responsibility,” “corporate citizenship” and “sustainable enterprises.” All of these discussions have in common that they mainly deal with large multi-national companies, while putting less emphasis on small and medium-sized enterprises (SMEs). However, the social and environmental commitment of small and medium-sized businesses may be just as strong as in large corporations (Center for Corporate Citizenship at Boston College and U.S. Chamber of Commerce, 2004). In addition, a number of industries consist primarily of SMEs, providing a large number of jobs and playing an important role in regional development.

Even though not much methodological research seems to have been done on how to estimate the contributions of SMEs toward quality of life and sustainable development, there are some empirical studies on how they differ in their motivation and strategies from large companies. For instance, small firms seem to have less need than large companies for formal instruments facilitating the communication of values and norms within the enterprise and to their customers. Rather, they seem to prefer direct contact and a dialogue strategy oriented at the expectations of their individual customers and other stakeholders.¹

Thus, since SMEs typically do not communicate about their social and ecological engagement in a systematic way to the public, it tends to be not publicly acknowledged. Also, since different strategies and activities are applied by SMEs in comparison to large firms, their social and ethical activities may not be measurable in the same way (Spence *et al.*, 2003; BitC, *et al.*, 2002; Kenner Thompson and Smith, 1991; Quinn, 1997; Spence, 1999; Vyakarnam *et al.*, 1997).

The present paper presents a method developed within the project “Regional Wealth Reconsidered”² for estimating the contributions toward quality of life and sustainable development made by a regional industrial sector consisting of SMEs. It is organized as follows: In section 2, we describe the overall analytical framework of the method, the development process for the indicator set, and the empirical design. Section 3 provides insight on preliminary empirical results of a study investigating the organic agriculture and food sector in the Brandenburg-Berlin region, Germany. In particular, we present data about four fields of activity that are assumed to (1) contribute toward “human potential” through formal and informal education, (2) contribute toward the stabilization of social resources, (3) improve non-material quality of life aspects, and (4) contribute toward environmental protection and aesthetic attractiveness of the region’s landscape. In section 4, we summarize our findings and draw conclusions about the method itself and the kind of information it generated.

2 A Method for Analyzing the Contribution of a Small-Business Industrial Sector to “Sustainable Wealth” of a Region

The method was developed based on the assumption that SMEs differ among themselves in the ways they contribute toward quality of life and sustainable development in their region. Further, our aim is to analyze the activities of a regional sector in order to make them visible for three groups (1) the enterprises themselves, (2) the local community, and (3) surrounding institutions. In doing so, we want to contribute toward developing broader political strategies for regional development, which thus far have been generally based on rather narrow monetary conceptions of wealth.

In order to describe the contributions of SMEs to society and the environment, we searched for an analytical framework that would help to operationalize this broad approach, choosing a concept of sustainable development that already contains most of the aspects commonly referred to in quality of life concepts (see Table 1). We then found dimensions of quality of life that were not already part of the selected sustainability concept and added them to our analytical framework called “sustainable wealth” (see Section 2.1). The reason for doing so was our assumption that implementing a concept of sustainability at the regional level can be heavily supported by including questions of quality of life. In adding aspects of individual and collective quality of life we stress the *opportunities* provided by sustainable development for both individuals and society in addition to the limits that are implied by it. Referring to businesses, we do not concentrate only on aspects that assure that enterprises “do no harm” to their natural and social environment, but

Table 1. General objectives and the basic requirements (Rules) of sustainable development.

General objectives	1. Ensuring human existence	2. Preserving the potential for production and reproduction ^a	3. Maintaining development potential
Rules	1.1. Protection of human health 1.2. Securing the satisfaction of basic needs 1.3. Autonomous self-support 1.4. Just distribution of access to the natural environment 1.5. Compensation of extreme differences in income and wealth	2.1. Sustainable use of renewable resources 2.2. Sustainable use of non-renewable resources 2.3. Sustainable use of the environment as a sink 2.4. Preserving and supporting the reproductivity of nature ^b 2.5. Avoiding unjustifiable technical risks 2.6. Sustainable development of the material conditions for production and reproduction ^c 2.7. Sustainable development of human potentials and knowledge for production and reproduction ^c	3.1. Equal access to education, occupation, and information 3.2. Participation in societal decision making process 3.3. Maintaining cultural heritage and cultural diversity 3.4. Maintaining cultural functions of nature 3.5. Maintaining social resources

Note: ^a Original: preserving the production potential; ^b Original does not contain this rule; ^c Original: Sustainable development of material, human and knowledge capital (ibid.).

Source: Kopfmüller *et al.*, 2001, p. 172; modified and extended.

also take the various activities into account that—to our opinion and knowledge—contribute toward improving individual and regional well being.

Since the analytical framework of “sustainable wealth” is very broad it can be applied to various contexts such as nations, regions, different economic sectors, or projects of regional development. Yet, in order to apply it we have to operationalize it, using relevant criteria and indicators. In our case, we are investigating the organic agriculture and food sector in the Brandenburg-Berlin region of Germany. In order to narrow down the analytical framework for this specific application, we developed four research questions and defined areas of business activity to be investigated (see Box 1). With the sustainability rules and the quality of life dimensions of our framework in mind, we then developed criteria and indicators for these four areas of research (see Section 2.2).

2.1. *The Analytical Framework of “Sustainable Wealth”*³

Our framework for analyzing the societal activities of a regional sector is based on the concepts of quality of life and sustainable development in the following way.

Framework components of sustainability. Concerning our understanding of sustainability, we refer to the concept of Kopfmüller *et al.* (2001), which defines a set of objectives and basic requirements (rules) for sustainable development. However, we have slightly modified the definitions of one general objective and the corresponding rules in order to highlight the reproduction sphere of society. In particular, we did so by including the non-profit sector and the reproduction activities of households as important equivalents to the market-based production sector. These modifications are based on our broad understanding of the terms “economy” and “work,” referring to the theoretical conceptions of some feminist economists (Biesecker and Hofmeister, 2000; Biesecker and Kesting, 2003). The result of these modifications is a set of 17 rules (see Table 1). These rules are later operationalized through the development of criteria and indicators (see Section 2.2).

Framework components of quality of life. Surveying the literature on conceptions of wealth, we found that the concept of quality of life largely overlaps with that of sustainable development in considering material and non-material, subjective and objective as well as individual and collective aspects (Noll, 2000). Referring to the concept by Allard (1993), we distinguish the following three spheres of quality of life: (1) the material sphere of “having” (material wealth, availability of public goods), (2) the social sphere of “loving” (family life, friendship, love, etc.), and (3) the sphere of personal development and self realization, labeled “being” (learning, sense of life, participation, etc.). In other conceptions, a fourth dimension, the “societal sphere,” is mentioned that is related to freedom, solidarity, justice, etc. (Bulmahn, 1999; Canadian Policy Research Networks, 2001; Independent Commission on Population and Quality of Life, 1998; Krause and Habich, 2000).

Comparing these four spheres with the basic requirements for sustainability of Kopfmüller *et al.*, we found that the chosen sustainability concept largely covers the quality of life spheres of “having” and “loving” as well as the “societal” dimension

(freedom, solidarity, etc.).⁴ However it appears that aspects of the “being” sphere (personal development and self-realization) are not constitutive parts of the sustainability concept. Yet, dimensions like availability of time, regional identity, and joy in living contribute toward quality of life without necessarily endangering the goals of sustainable development. Revealing these aspects may help to systematically identify options for realizing a “good life” within the limits defined by the concept of sustainable development. Thus, we included these dimensions into our “sustainable wealth” framework.

2.2. *Developing the Indicator Set*

The starting point for developing indicators on the activities of SMEs is our “sustainable wealth” concept (as presented in Section 2.1). Our first step in applying this analytical framework to the organic food sector in the Brandenburg-Berlin region of Germany was to pose four research questions. These questions are based on a selection of those “sustainable wealth” aspects that are particularly relevant for both the sector and the region, while leaving out others of less relevance. The second step was then to search for adequate indicators by reviewing literature on indicator systems in different fields. The result of this survey was a large number of possible criteria and indicators. This set was reduced, in a third step, down to a manageable size through the involvement of experts from the organic agriculture and food sector. The three steps are described in detail on the following pages.

Posing four research questions. Our research questions are concerned with discovering the special contributions made by the organic agriculture and food sector to the Brandenburg-Berlin region of Germany. Information about the main difficulties the region and sector face comes from a survey of regional reports and from communication with regional stakeholders.

We assume that the sector is particularly strong in contributing to four regionally relevant fields that provide the major focus of our research (see Box 1).

Related to our framework of “sustainable wealth,” contributions (1), (2), and (4) belong to the general sustainability objectives of “preserving the potentials for production and reproduction of society” and “maintaining the development potentials” (Table 1), whereas contribution (3) represents the “being” sphere of personal development and self realization, drawn from quality of life conceptions.

Developing the criteria and indicator set. We developed the criteria and indicator set based on a literature survey in the fields of quality of life, social welfare, social capital, corporate social responsibility, sustainable enterprise, sustainable agriculture and nutrition, and regional sustainable development. Based on the survey, we were able to identify many criteria and indicators that directly apply to our four areas of research (see Box 1), but also had to modify a number of them.

Most of our indicators describe business *activities* rather than regional *effects* for the following reasons: Firstly, activities can be analyzed relatively easily by carrying out a questionnaire-based business survey. Secondly, effects are very difficult to assign directly, since they often appear only after a long period of time. Thirdly,

Box 1: Four research questions concerning the contributions of the organic agriculture and food sector in the Brandenburg-Berlin region toward “sustainable wealth”

Does the organic agriculture and food sector in the Brandenburg-Berlin region . . .

- (1) Preserve and create knowledge about dealing with nature and health issues in a sustainable way (human potential)?
- (2) Preserve and create social potential and social resources?
- (3) Preserve and create non-material quality of life?
- (4) Contribute toward environmental protection and landscape aesthetics?

direct cause-effect relationships are also difficult to assign because we often find several regional actors involved in social and environmental activities (multiple causation) as well as a number of effects resulting from the activities (multiple effects). Lastly, enterprises can be compared more easily by their activities, and policy as well as business advice can be offered in a more direct way, when referring to activities. However, in order to draw conclusions about the regional effects, we chose to focus on those activities for which the link to their effects is either proven or highly probable.

In the following, we present selected criteria and indicators for fields (1) to (4).

(1) *Human potential*, in our understanding, includes human capabilities and knowledge that are necessary for leading a sustainable lifestyle. In contrast to the widely used understanding of human *capital*, we are interested in knowledge that can be used for market-based activities as well as experiences and knowledge that are necessary for reproductive activities *outside* the market, for example, for sustainable consumption and nutrition. This seems very important, since the literature on nutrition often states a lack of general knowledge in the fields of purchasing and preparing food in a sustainable way. Concerning the contribution of enterprises toward creating human potential, most of the indicators we found deal with training opportunities for employees and concentrate on formal ways of passing on knowledge (Federal Government of Germany, 2002; CSD, 1996; Kopfmüller *et al.*, 2001). We have included such indicators in our set, but we also wanted to study activities that help to spread knowledge and experience beyond the enterprises, to people in the local and regional community. Further, we have included informal ways of communicating information and experiences, because they seem to be an important complement to the spreading of cognitive knowledge (Clar *et al.*, 1997). Thus, our criteria refer to activities of enterprises related to (1) providing education opportunities, (2) communicating knowledge and experience in informal ways, (3) supporting “reflectivity,” and (4) maintaining cultural heritage. Examples for informal ways of communicating information are open house days or guided tours; an example for “reflective” activities is exchange regarding visions and ideas with other stakeholders in the region; and an exemplary activity to maintain cultural heritage is the production or use of rare plant or animal species. These indicators are used to operationalize the basic requirements defined in sustainability rules 2.7 and 3.3 (see Table 1).

(2) Concerning the contribution of business to *social resources*, we again look at activities that are directed at the employees as well as those that are assumed to improve social resources in the local environment. Regarding the development of social potential within enterprises, we look at activities that allow employee or customer participation (e.g., possibilities for the employees to participate in business decisions or efforts to know more about customers’ needs). Related to social capital and corporate citizenship, the engagement in or the support of non-profit organizations are important business activities that help to sustain the social infrastructure. Further, we look at business engagement in regional and business networks as well as at activities to support other organic enterprises. These items operationalize sustainability rules 3.2 and 3.5 (see Table 1).

(3) We investigate contributions to *environmental and natural protection* that go beyond the standards of organic agriculture. We do this because there is already solid evidence about the fact that the production of food following the standards of organic agriculture helps to preserve natural resources such as soil, water, animal and plant species, and air quality while using less energy than conventional agriculture, mainly because mineral fertilizer and synthetic pesticides are not used (FiBL, 2000; Köpke, 2002; Stokstad, 2002, etc.).

Thus, we focus on contributions that are assumed to arise from supplying renewable energy, avoiding emissions, reducing the use of energy and water, and maintaining appropriate conditions for animal and plant species. These activities can be summarized under the categories of sustainable use of renewable and non-renewable resources, sustainable use of environment as a sink, preserving reproductivity of nature, and avoiding unjustifiable technological risks, corresponding to sustainability rules 2.1 through 2.5. In addition, we look at the contributions of the industrial sector toward landscape aesthetics, which we assign to activities such as preserving habitats and species or creating new habitats (e.g., planting hedges or trees, installing buffer zones at water courses), corresponding to sustainability rule 3.4 (see Table 1).

(4) The criteria presented so far already contain many dimensions that are usually part of the concepts of *quality of life*, such as education, participation, and environmental protection. In addition to that, we look at business contributions toward individual satisfaction with working conditions and income as well as individual perceptions about self-realization and joy in living derived from peoples’ jobs. An aspect of collective quality of life that we derived from the literature is activities that support a sense of regional identity.

Collecting indicators to operationalize the four fields of interest of the survey lead to a set of 151 indicators altogether. Usually, a number of indicators are used to describe different aspects of one criterion.

Reducing the indicator set. So far, the indicator set has been developed “top-down,” that is, by the researchers of the project. Yet, in many processes for developing regional quality of life or sustainability indicators, such a top-down process of indicator development is combined with a participative “bottom-up” process to select the most appropriate indicators in a given regional and industrial context (Canadian

Policy Research Networks, 2001; Jacksonville Community Council Inc., 2002; Kopfmüller *et al.*, 2001; Seattle Community Network, 1995). Such a combination is expected to support the (unavoidable) valuation of criteria and indicators by including the perspectives of those under investigation about the relevance of individual criteria and indicators. Further more, discussions about the project's normative premises and goals, as well as explanations of the rationale for including certain indicators in the set may help to create acceptance for the survey amongst sector representatives.

Consequently, regional stakeholders from the organic food sector participated in the selection of the most relevant indicators in the following way. Altogether seven representatives of regional business associations from the organic agriculture and food sector and three managers/owners of regional enterprises (organic agriculture, food processing, and trade) were asked to vote on which of the suggested indicators would be most relevant or best suitable for describing the contributions of the sector toward quality of life and sustainability. Then, we discussed in a workshop why some indicators were voted to be more relevant than others. During the discussion, the participants mainly took two aspects into account: (1) whether the sector is able to make a useful contribution to the field concerned and (2) whether the regional situation requires this contribution.

This participative step allowed the reduction of the set down to 70 indicators without substantially losing complexity. Overall, the representatives acknowledged the broad approach of the project and identified important indicators in all four fields of research focus. However, the main responsibility of the sector was seen to be in contributing toward preserving natural resources.

During the selection process of the final indicator set, the research team followed most suggestions of regional stakeholders of the sector. Suggestions to discard indicators were only rejected if they would mean that indicators would no longer cover all of the four fields of research focus.

The majority of the 70 indicators developed in our project (see Schäfer, 2004) were incorporated in a questionnaire-based survey that was sent to all of the approximately 1000 enterprises of the organic agriculture and food sector (farms, processors and retail companies) in the Berlin-Brandenburg region. In addition, those indicators that were difficult to survey by questionnaire (e.g., aesthetic sensibility, activities to promote tolerance, equality between men and women, working conditions of the employees) were included in nine case study interviews with four farms, three processing enterprises and two retail companies.

2.3. *Transferability of Method and Indicators*

Regarding the transferability of the method, we have to differentiate between two aspects: (1) the methodological steps and (2) the research questions, criteria and indicators. Concerning the *methodological steps*—posing context-related research questions, developing a literature-based criteria and indicator set, and participatory reduction of the indicator set—we think that they can be successfully applied to other economic sectors, development projects, and so on.

Although the *research questions* (Box 1) are all related to the analysis of entrepreneurial corporate social responsibility, they may not necessarily be posed in the

same way for other economic sectors and regions. The focus on landscape aesthetics is, for example, specific to the analysis of a sector that contributes toward the actual development of landscapes. Similarly, although the *criteria* chosen to operationalize the research questions reflect a broad perspective that could be applicable to a number of sectors (e.g., formal and informal ways of spreading knowledge, supporting reflectivity and cultural heritage, issues of participation, engagement in NGOs and networks, strengthening of social resources, sustainable forms of dealing with emissions, avoiding unjustifiable risks), there may be others that are more important when analyzing a different economic sector and region. In addition, we feel that most *activities* of the economic sector—those activities which presumably contribute to the sustainability goals defined by us—are likely to be rather different if we look at other sectors such as the textiles, communications, or energy sector. Consequently, the sets of research questions, criteria and indicators have to be newly developed for each context, that is, economic sector and region.

In addition, the organic agriculture and food sector is a rather special industrial sector that in some respects is not very typical of the majority of SMEs. The sector is different from other industries because it has committed itself to rather high standards concerning the ecological aspects of the production and processing of food.⁵ Concerning the ecological dimension, it is therefore a potential “best-case group,” which could serve as a model for sustainable development of the whole agricultural sector. The goal of our research project is to gain additional information about the performance of the sector in other dimensions (see Box 1).

3. Contributions of the Organic Agriculture and Food Sector in the Brandenburg-Berlin Region (Germany) toward “Sustainable Wealth”

Before presenting preliminary results from the application of the indicator set, we will briefly describe the historical development and structure of the organic agriculture and food sector while introducing our study sample.

3.1. Overview of the Organic Agriculture and Food Sector in the Brandenburg-Berlin Region and the Study Sample

The Brandenburg-Berlin region consists of the agglomeration Berlin (3.2 million inhabitants), which for forty years was divided into East and West Berlin but is now the German capital, and the surrounding rural area of Brandenburg, with a low population density, few industrial structures, and a rather high percentage of state-protected areas. In the former German Democratic Republic (GDR, called “East Germany” in the following), agriculture was mostly organized in rather large cooperatives of several thousand hectares (ha) of state-owned land. Only very few small farms practiced organic agriculture; and it was not at all possible to buy organic food. With the German unification, the agricultural sector in East Germany had to adapt very quickly to conditions in the European Union. Because subsidies were

given to businesses carrying out organic food production, the transformation to organic agriculture was an attractive option for cooperatives and farms, especially for those on low-quality soil.

The number of organic farms in East Germany grew rather quickly in the last decade; in Brandenburg there are 577 organic farms today, working on 8.8% of Brandenburg's total agricultural land. We can observe a new type of organic farm in East Germany, characterized by a higher average size in comparison to farms in West Germany (158 ha and 29 ha, respectively) and a higher portion of products sold outside the region on national or international markets.⁶ There are around 170 food processing enterprises in the region, 70 of them being located in Berlin. Most of them process fresh products like grains, milk, meat and fruit. However, the level of processing is rather low. Almost no firms in the regional organic processing industry sell outside the region. All companies are SMEs, the majority of them being bakeries.

Concerning the distribution of organic food products, before the unification West Berlin already had a broad variety of shopping facilities. Today we find approximately 200 natural food stores, organic supermarkets and bakeries in Berlin selling organic food only. These products can also be bought in health stores, at open markets and in conventional supermarkets. In rural Brandenburg, the consumption of organic food is rather low and growing slowly due to the low income of the population, few facilities where these products can be bought and slowly changing attitudes towards the value of healthy and environmentally sound food. There are about 45 organic stores in the Brandenburg region.

In our survey, all of the organic companies in Brandenburg-Berlin were contacted by mail and asked to fill out a questionnaire. Our resulting sample consists of 202 farms, 47 processing firms, and 83 retail stores, most of them being small enterprises with less than 10 employees (92% of the farms, 51% of the processing firms and 87% of the stores). Only 11% of our processing industry sample have more than 50 employees.

Farms, processing firms, and stores are each represented about equally in the sample, which itself consists of about a third of the total number of existing firms for each category (see Table 2). Concerning company size, our sample of farms is very similar to the complete group of organic farms in the region. However, the

Table 2. General structure of the organic agriculture and food industry in the Brandenburg-Berlin region (Germany) and study sample.

Sector	Number of companies in Brandenburg- Berlin region	Number of companies in study sample	Percentages (%)
Organic agriculture	about 580	202	35
Organic food processing	about 170	47	28
Retail industry for organic food	about 250	83	33
Total	about 1000	333	33

sample contains slightly more farms that are organized in organic farm associations, compared to the total of such farms in Brandenburg (55% in sample, compared to 52% in total (MLUR, 2004)). Since no statistical data is available on the organic food processing and retail sectors in the region, we included about equal numbers of both small and medium-sized enterprises as well as the whole range of products produced in the region. Altogether, we conclude that our sample allows for relatively reliable estimates concerning the total number of organic enterprises in the Brandenburg-Berlin region.

3.2. Selected Results

Most of the indicators that we developed were included in the questionnaire, the rest of them being derived from public statistics.⁷ In the remainder of this section, we present some results of the questionnaire-based survey related to our fields of research (1) to (4) (see Section 2.2).

Passing on knowledge and experience. The sector carries out various internal and external educational measures and informal activities (see Figure 1). In our opinion, these activities can be seen as contributing toward the “formal” education of people in the region, especially in rural areas. Additionally, they help in “building bridges” between city and countryside and strengthening the regional identity perceived by the region’s inhabitants.

Our results show that more than 60% of the organic food processing and retail enterprises offer training measures for their employees while 30% are active in further education for young people (see Figure 1). Organic farms do both to a lesser extent.



Fig. 1. Activities of passing on knowledge and experience.

A rather high percentage of managers in the sector discuss their visions and goals with other stakeholders, both formally (in organic associations) and informally.

About 53% of the firms communicate with the public on *additional* topics besides advertising. Half of the enterprises maintain contact with their customers and the local community through activities such as open house days, guided tours, participating at local or regional events, or offering informational material. Approximately one fifth offer workshops or lectures or participate at public discussions (see Figure 1). While the farms and the processing enterprises mainly communicate topics of organic agriculture and social concerns, retail enterprises focus additionally on themes concerning health, nutrition and genetic manipulation. One fourth of all enterprises refer to regional questions. Altogether, organic food processing enterprises seem to be especially active in passing on knowledge and experience, while only a relatively small fraction of farms exhibit such activities.

Preserving and creating social resources. Our results suggest that the sector is not outstanding with regard to the social aspects of the prevailing working conditions. Overall, one fourth of the respondents offer special benefits to their employees such as flexible working hours or additional retirement benefits.⁸ Only the processing enterprises are active in this field, with almost half of them offering special social benefits (see Figure 2). Considering that many of the organic enterprises face economic problems—only one fourth of them are content with their income (see Figure 3)—this result is not surprising. Amongst the processing enterprises the percentage of owner/managers that are not content with their income is lower (23%) than those of the farmers (35%) and of the owner/managers of retail stores (42%)—they therefore seem to have more financial means to provide their employees with benefits. About half of the managers in processing and retail enterprises, and one third of the managers of farms, are women. Altogether, about 49% of the employees in our sample are female. Women are represented with the highest percentage in the retail enterprises (71%), followed by the processing enterprises (49%) and the farms (37%).

Both agricultural and processing enterprises are rather active in supporting other regional enterprises (more than 45%). This includes support with machines, raw materials, fodder, or financial aid (loans with low interest rates, delay of sending out bills, etc.). The “solidarity” of retail enterprises seems to be lower. More than 60% of the responding food processing and retail enterprises claim that they make efforts to know more about the needs of their clients, mostly by directly talking to them, sometimes by questionnaires or by offering facilities for customers to write down and drop off suggestions or complaints. Only 29% of the farms offer such opportunities, often because they do not have direct contact to the consumers.

Overall, the sector is rather active with regard to the “classical” activities of corporate social responsibility: supporting non-profit organizations through financial aid or material support (about 60%) and, to a lesser extent, by being active in regional non-profit organizations, such as associations, initiatives, and grass-roots movements (about 36%; see Figure 2). Various non-profit organizations, such as environmental and organic associations, natural parks, movements for zones without genetically manipulated organisms, and initiatives for sustainable regional development are mentioned by farmers. In rural areas, these activities are generally

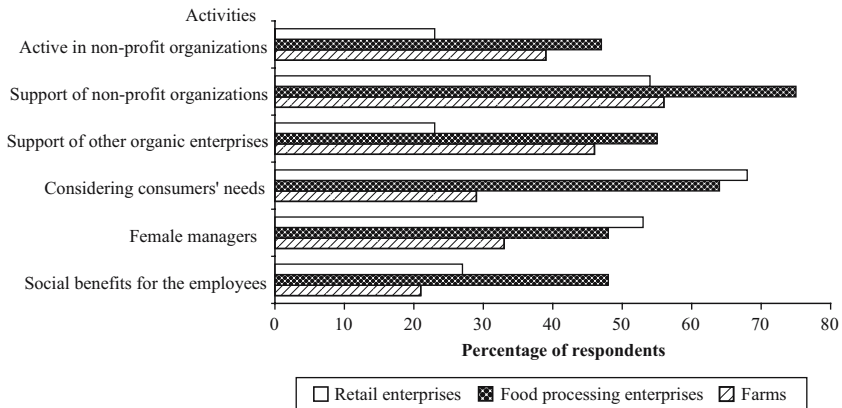


Fig. 2. Social activities.

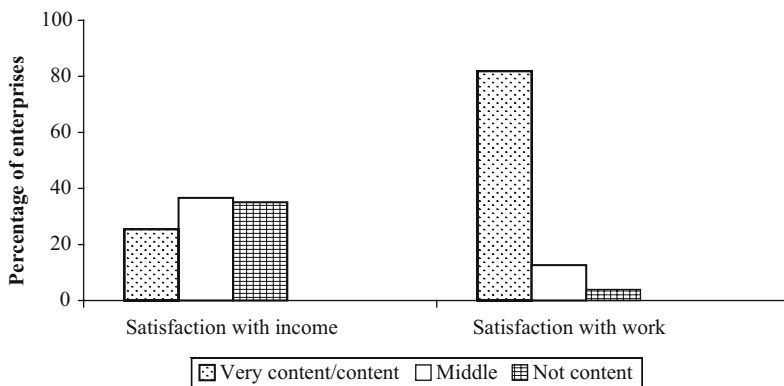


Fig. 3. Satisfaction with income and work.

seen as being helpful toward stabilizing the social infrastructure, forming the basis for future development. The sector’s activities assumed to be contributing toward social resources are summarized in Figure 2.

Non-material aspects of quality of life. Managers and employees of the sector were asked about how satisfied they are with their jobs and working conditions.⁹ Our results show that income satisfaction is not homogeneous: only 26% of the managers are content or very content with their income. Self-realization however seems to be fulfilled in most cases: around 80% of the managers overall (in all three types of enterprises) are satisfied with their work and claim that it contributes to their personal joy in living (see Figure 3). Around 45% of the managers, however, claim that they often feel stressed.

Environmental protection and contribution to landscape aesthetics. Opportunities for ecological activities vary greatly amongst the three categories of “organic” enterprises (farms, food processing and retail). Therefore, we asked them different sets of questions.

The results show that food-processing enterprises tend to focus on activities for saving water (45%) and energy (62%) and reducing their emissions (35%). About 13% of these enterprises generate renewable energy and 26% carried out environmental audits. About 40% of the farms claim to save water and energy, and 21% generate energy from renewable resources. More than a third of the agricultural enterprises preserve soil fertility, whereas about 60% protect habitats and species. The latter seems to be especially important for a majority of the farmers. To enhance structural diversity, hedges and trees are planted, biotopes are cultivated, and “buffer zones” beside watercourses are installed. Additionally the farmers are cautious in the way they work on their fields with regard to the protection of certain species (e.g., time and type of mowing).

With such activities, we believe that the organic agricultural sector can be seen to be contributing considerably to diversity and landscape aesthetics in a region that is dominated by large-scale agriculture and, at the same time, containing a high percentage of natural preserve areas. Almost one third of the farmers and food processing firms work with some almost extinct plant or animal species and, in this way, help to preserve genetic diversity. Figure 4 gives an overview of ecological activities of organic farms and food processing firms. Since retail companies have fewer opportunities for ecological measures they are not included in Figure 4. Twenty-five percent of them buy renewable energy and almost 90% claim to use environmentally sound products, for example, for cleaning purposes.

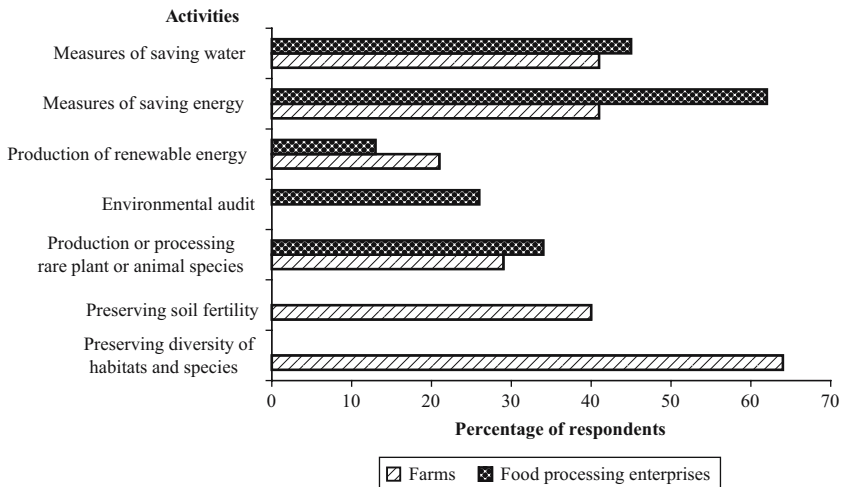


Fig. 4. Ecological activities and contribution to landscape aesthetics.

4. Summary and Conclusions

The method developed by us for analyzing the contribution of a regional industrial sector to sustainable development and quality of life has generated useful information on the activities of the selected sector related to society and the environment. The results suggest that it is worthwhile to look more closely at the societal activities of SMEs, which still represent “the backbone” of European societies.

Using the concepts of sustainable development and quality of life and developing the framework of “sustainable wealth” has helped us to maintain a broad perspective throughout the analysis. They were also important ingredients for formulating our context-related research questions. Furthermore, adding dimensions from the sphere of personal development and self-realization to our “sustainable wealth” framework has helped in obtaining a better picture regarding qualitative aspects of work (e.g., self-fulfillment) in this sector.

For analyzing SMEs, the analysis of activities seems to be a more useful approach than analyzing management systems, codes of conduct, formal responsibilities, etc. Also, beginning the analysis on the business level (with the questionnaire) and later aggregating the data for the entire sector has proven to be very helpful.

The focus on activities has the disadvantage that no conclusions can be derived about the actual *effects* of entrepreneurial behavior. Thus, while some cause-effect relationships may be taken as given, (e.g., the link between maintaining biotopes and higher variety of species, the link between training activities and human potential, or the link between engagement in non-profit organizations and social resources), other aspects cannot be explored as easily (e.g., the effects of informal ways of spreading knowledge and experience). However, the information available about these activities suggests that effects can be assumed. In our project, we accepted the disadvantages of focusing on activities while considering the advantages, for example, concerning data collection (see Section 2.2).

The following findings summarize the kind of information we were able to generate by using our method, much of which refers to potential effects of the sector, derived from its activities (rather than actual effects). Overall, the sector has the capacity to contribute toward regional quality of life and sustainable development in all of our four fields of investigation (human potential, social resources, non-material aspects of quality of life, environmental protection and landscape aesthetics). However, the contributions can vary between the three groups (organic farms, food-processing industry and retail sector). The organic farms are especially active concerning ecological activities, whereas the retail stores do not have many possibilities to engage themselves in this area. Farms and processing enterprises are active to a greater extent in regional networks than retail companies are. The retail stores engage in considering the needs of their customers and in spreading information via flyers and the Internet and by offering lectures. The processing enterprises show rather high engagement in many fields. For instance, in comparison to the two other groups, they show greater concern in considering additional benefits for their employees and offering training for young people.

Concerning the creation of human potential, the organic agriculture and food sector in the Brandenburg-Berlin region is rather active in communicating about

issues such as environmentally sound agriculture, healthy nutrition, the quality of manufactured products, the risks of gene manipulating techniques. In doing so, it can contribute to developing a “sustainable food culture.” In rural-urban regions like Brandenburg-Berlin, the sector can also play an important part in “building bridges” between city and rural areas, allowing people from the city to observe and experience food production and processing activities while gaining a sense of regional identity.

Especially in rural regions with little industry, SMEs of the organic agriculture and food sector can play an important role in sustaining social resources, serving as “start-off points” for regional development. The networks we have found, link actors of the food producing and processing sector with actors from a variety of other business and non-profit sectors (e.g., tourism, gastronomy, production of renewable resources, landscape preservation, health or wellness institutions, educational institutions). Within these networks, a variety of projects regarding regional development between different actors are being planned and realized.

Having started off as an “ecological movement,” the organic agriculture and food sector can contribute toward environmental protection through efficient use of resources and environmentally-sound management. Further, organic farms in the investigated region are very active in cultivating an aesthetically attractive landscape through the preservation of habitats and species. In addition, the sector can contribute to individual self-realization and joy of life by supplying satisfying work to those working in it.

The study results also show that the sector is not homogenous and that not all businesses are equally active in all investigated fields. Further analysis will show whether we can identify types of enterprises with a focus on certain activities. These findings should help in the design of policy measures directed at the sector and the region’s development as well as to support the sector’s contributions toward quality of life in the region and sustainable development more than it has been doing until now.

Notes

1. The reason for this may be that SMEs are directly oriented at what their individual customers expect them to engage in and how their engagement can be tied to their own business interests, whereas large firms are rather motivated to improve their general public image (Institut für Mittelstandsforschung Bonn, 2002).
2. The project “Regional Wealth Reconsidered. The Contribution of the Organic Agriculture and Food Sector toward Quality of Life” is carried out in cooperation between the Center of Technology and Society of the Technical University Berlin and the German Institute for Economic Research, Berlin. It is funded from 2002 until 2007 by the German Ministry of Education and Research within its “Social-Ecological Research Program.”
3. The concept of sustainability we refer to and our understanding of wealth are described in more detail in Schäfer *et al.* (2004).
4. Yet, sustainability also means more than quality of life by including the normative idea of ensuring the “rights” of future generations.
5. Organic farms commit themselves to certain rules of cultivation. For example they don’t use synthetic fertilizer and chemical pesticides. Organic processors are not allowed to apply chemicals to their products (e.g., artificial coloring, preservatives).

6. The latter development is due, in part, to the fact that the organic processing industry has not grown as quickly as the organic agricultural sector.
7. However, in order to get a full impression of the sector's contributions toward quality of life and sustainability, in a later stage of our project, qualitative indicators identified through case studies of approximately ten firms will supplement the quantitative results. In these qualitative interviews with directors of the enterprises and employees, we intend to learn more about the motivation for their engagement, synergies and conflicts between the activities that are carried out, and supportive or inhibiting conditions.
8. However, it has to be taken into consideration that the working hours in the agricultural sector are seasonal.
9. In the questionnaire, we had to focus on the managers, but in the case studies we will also interview employees.

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Fuel Sources and Well-Being in the Marshall Islands*

JAGJIT SINGH

Introduction

The task of measuring and assessing the quality of life in different parts of the world especially in North America and Europe has been given a great deal of attention by social scientists over the last thirty to fifty years. The critical question raised in relation to the quality of life is generally on the variations in socioeconomic conditions of people in differing parts of the world. It was felt that access to clean and reliable energy for essential needs such as water, healthcare facilities, cooking and lighting could be one of the most pressing problems facing humanity (Greenpeace, 2003). It is estimated, for example, that during the twenty-first century, two billion people would have no access to electric lighting (Greenpeace, 2003).

There is still no universally accepted indicator or indicators to measure the quality of life. Therefore, assessing the quality of life is a complex undertaking and there are many different views on the manner in which it should be assessed and measured. In this research, the quality of life on atolls in the Marshall Islands will be explored in the context of capability and functioning as conceptualised by Sen (Nussbaum and Sen, 1993). Capability is operationalised by annual median incomes while functioning is operationalised by fuels used for lighting and cooking.

Theoretical Considerations

There are conflicting philosophical views in the literature on the quality of life. In the absence of a clear definition of what constitutes “quality of life,” many arguments have been advanced on ways to measure it. A widely used measure in public policy decision making is per capita Gross National Product (GNP). However, this measure is increasingly considered inadequate and perhaps not the most appropriate to measure the quality of life. This measure, which has its origins in the utilitarian

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philosophy, is being replaced with ideas that will incorporate activities that make up a “thriving human life” (Nussbaum and Sen, 1993).

In capability literature, (Nussbaum and Sen, 1993) capability and functioning are explained as follows:

Functionings represent parts of the state of a person—in particular the various things that he or she manages to do or be in leading a life. The *capability* of a person reflects the alternative combinations of functionings the person can achieve, and from which he or she can choose one collection. The approach is based on a view of living as a combination of various “doings and beings,” with quality of life to be assessed in terms of the capability to achieve valuable functionings.

Some functionings are very elementary, such as being adequately nourished, being in good health, etc., and these may be strongly valued by all, for obvious reasons. Others may be more complex, but still widely valued, such as achieving self-respect or being socially integrated

Sen (Nussbaum and Sen, 1993) is of the view that the quality of a person’s life should be assessed in terms of the capabilities. A capability is the ability or potential to achieve a certain functioning. Functionings are divided into four overlapping categories, which Sen calls well-being freedom, well-being achievement, agency freedom, and agency achievement. Our capabilities are our potentials for all of these things (Nussbaum and Sen, 1993).

Laderchi reviewing Sen’s ideas has noted that expansion of human capabilities and not maximisation of utility or its proxy (money income) are important considerations (Laderchi, 2001b; Laderchi, Saith, and Stewart, 2003a). It is noted that the measure of well being was freedom to live a valued life. In this context, basic capability was seen as ability to satisfy important functionings up to certain minimally adequate levels (Nussbaum and Sen, 1993). Additionally, it was argued that monetary resources may not be a reliable indicator of outcomes because of variations in people’s ability to transfer their resources into valuable achievements (functionings). Laderchi reviewing Sen’s ideas on capability has effectively shown a conceptual link among such factors as private monetary income, social income and functionings, (Laderchi, Saith, and Stewart, 2003a)

Some empirical work has already been done using the capability and functioning approach. The most notable contribution has been made by Laderchi and published as working papers. In one such study, she has compared the empirical consequences of Sen’s capability and mainstream monetary approach. She explored the relationship between monetary resources and individual achievements by listing parametric variations, highlighting some non-monetary factors of individual achievements.

While the capability and functioning approach has focussed on individuals, there is no requirement that an individual should always be the unit of analysis. The choice of the unit of analysis should depend on the research questions being addressed and the level at which the researcher wishes to generalise (Judd *et al.*, 1991). In many research situations data collected (and aggregated) by governments and world organisations are used by researchers to make generalisations on individuals.

The research objective in this study was to explore variations in living standards (well-being and/or welfare) among the different atolls in the Marshall Islands. It is argued that fuel sources for lighting homes and cooking influences and reflects on the quality of life on the atolls.

Quality of Life and Fuel Sources

In temperate climates, one way of defining an aspect of quality of life is in terms of warmth. Thus a fuel-poor household is widely recognised as one that spends approximately 10% of its income on all fuel used to maintain adequate standards of warmth. A yardstick of household warmth established by World Health Organization (WHO) is temperature in the range of 18–26°C. On this basis it was established that in the United Kingdom in 1996, there were 5.5 million fuel-poor homes (Hunter, 2003a,b,c,d)

A number of causes have been suggested for fuel poverty. These were a combination of factors: energy efficiency, fuel costs and household income. These factors can explain fuel poverty on the isolated and remote atolls of the Marshall Islands. Of the three factors, the focus in this research is on household income.

Fuel poverty has a wide-ranging effect on the quality of life. In the temperate countries for example, there is a relatively high incidence of influenza, heart diseases and strokes resulting from poorly heated homes. In the case of the tropics and in the Marshall Islands in particular, skin diseases are widespread because there is not enough clean and reliable energy to operate medical equipment in dispensaries and desalination plants to provide clean drinking water. Fuel poverty also results in poor diets and low employment.

Method

Data for this study was extracted from the last Census of the Marshall Islands (Butuna, 1999). Capability was operationalised by household median incomes, while functioning was assessed by the fuel sources for lighting and cooking. It might be noted that the median was considered a better measure than the mean for reporting household incomes because there are big differences between in the incomes of rural poor and the affluent households in the urban areas. Reporting means of variables with extreme values would tend to distort the results. Variables used in this study are noted in Table 1.

As the focus in this research is on the potential effects of median income on the fuel sources used, the Pearson product-moment coefficient of correlation (Huck, 2000; Singh, 1995) was considered a useful statistical method to analyse the data.

Internal consistency among the fuel source variables was established with the Cronbach Alpha reliability test. Alpha value of 0.83 was considered a fairly reliable internal consistency measure for variables used for functioning. Construct validity was established on the basis of existing literature on the importance of good clean fuel sources for healthy living (Hunter, 2003a,d). This was further validated in the context of “island life” with a survey of preferred fuel sources for lighting and

Table 1. Variables used in this research.

Variable name	Mnemonic
Median income per household	Medincome
<i>Percentage of households using</i>	
Electricity for lighting	Electlight
Kerosene for lighting	Kerolight
Solar energy for lighting	Solarlight
“Other” fuel sources for lighting	Otherlight
Electricity for cooking	Electcook
Kerosene for cooking	Kerocook
Propane gas for cooking	Gascook
Charcoal for cooking	Coalcook
Wood for cooking	Woodcook
Solar energy for cooking	Solarcook
“Other” sources for cooking	Othercook

cooking. All respondents agreed that fuel sources, particularly electricity, contribute to the quality of life.

The overall research objective was to explore the relationship between capability and functioning. More specifically the study assesses the effects of household median incomes on fuel type used for lighting and cooking in the different atolls/islands of the Republic of Marshall Islands (RMI). The question of ecological fallacy is to some degree minimised by dividing the atolls into three categories on the basis of median incomes (King, 1997).

The unit of analysis was the atolls and islands in the Marshall Islands. Twenty-three inhabited atolls and islands were used in the study. Data on Bikini and Rongelap atolls were not available, presumably because they remain uninhabited since the nuclear bomb tests between 1946 and 1954 (Bikini Atoll Celebrations, 1999; Singh, 1995, 2002). Enewetak has only recently been resettled after radioactive clean-up by the US Government. Using atolls as the unit of analysis could be justified on grounds that median incomes are fairly representative of income variations in the Marshall Islands, thus making possible ecological inference at the level of the household for each atoll/island. Further it might be added that household data aggregated at the level of atoll allows the application of multivariate statistical analysis with interval scaled measurements.

Results

High-Level Capability and Fuel Sources

Fuel source for lighting. High levels of capability, as measured by high annual median incomes, show in a mix of functioning as indicated by the fuel sources used. It can be seen from Table 2a that on Kwajalein Atoll, with an annual median income of approximately USD14,195.31, nearly 90% of the households use electricity for lighting. In the

Table 2a. Annual household median income and fuel for lighting: high-level capability.

Atoll	Median income (USD)	Electricit (%)	Kerosene (%)	Other sources of energy (%)
Enewetak	10,750	42	56.9	1.1
Kili	8114	100	0	0
Kwajalein	14,195	90	10	0
Majuro	9030	88	11	1.0

Table 2b. Annual median household income and fuel for cooking: high-level capability.

Atoll	Median income (USD)	Electricity (%)	Kerosene (%)	Other sources of energy (%)
Enewetak	10,750	2	20	78
Kili	8114	99	1	0
Kwajalein	14,195	38	59	3
Majuro	9030	36	54	10

capital Majuro, with an annual median income of USD9000, 88% of the households use electricity for lighting. In Kili, the new home of the Bikini Atoll people, with an annual median income of USD8114, all households use electricity for lighting. The only exception, though, in this mix of capability and functioning is Enewetak. This atoll has a high capability but only 42% of the households use electricity for lighting; it does not quite fit the pattern because it has only been recently resettled.

Fuel source for cooking. As shown in Table 2b, on the island of Kili just about all the homes use electricity for cooking. On Kwajalein, with a high capability, there is an interesting mix of functioning (fuels) used for cooking. While 59% of the households use kerosene for cooking, a moderately high (38%) use electricity. On Majuro too while electricity is used for cooking in most homes (54%), a moderately high percentage (36%) use kerosene. In contrast to these highly urbanised population (with strong cash economies), most households on atolls with low capability (with subsistence economies), continue to use wood for cooking. Enewetak is the only exception: it has a high capability but few households use electricity for cooking. It might be noted, however, that the relatively low use of electricity for both lighting and cooking (contrary to expectations, given its high capability) is partly due to the recentness of its resettlement following a “clean-up” of radioactivity and partly due to the delay by the US Government in settling nuclear compensation claims.

Middle-Level Capability and Fuel Sources

Fuel source for lighting. In this research, middle-level capability has been operationalized as atolls with annual median incomes between USD1001 and 7999.

Table 3a. Annual median income of householders and fuel used for *lighting*: middle-level capability.

Atoll	Median income (USD)	Electricity (%)	Kerosene (%)	Solar energy (%)	Others (%)
Arno	1845	7.0	76.6	15.6	.8
Aur	2056	1.2	93.0	5.8	0
Jaluit	3272	35.8	63.3	0	.9
Lae	2714	0	87.5	12.5	0
Likiep	2133	15.9	75.6	6.1	2.4
Maloelap	1634	13.0	76.1	10.9	0
Mejit	2263	0	100.0	0	0
Mili	1051	3.7	83.1	13.2	0
Namdrik	1409	0	4.2	94.9	.9
Utirik	3250	1.5	38.5	60.0	0
Wotho	2800	0	72.2	27.8	0
Wotje	2875	6.5	76.9	15.7	.9

Table 3b. Annual median income of householders and fuel used for cooking: middle-level capability.

Atoll	Median income (USD)	Electricity (%)	Kerosene (%)	Propane gas (%)	Charcoal (%)	Wood (%)	Other (%)
Arno	1845	2.5	15.6	2.1	.4	79.1	.3
Aur	2056	0	1.2	0	0	98.8	0
Jaluit	3272	14.8	23.1	.4	.4	60.3	1.0
Lae	2714	0	3.0	0	0	93.8	3.2
Likiep	2133	0	11.0	2.4	0	85.4	1.2
Maloelap	1634	0	23.2	0	5.8	69.6	1.4
Mejit	2263	0	1.7	0	0	98.3	0
Mili	1051	0	1.5	1.5	0	96.3	.7
Namdirk	1409	0	.8	.8	0	98.3	.1
Utirik	3250	0	0	0	0	100.0	0
Wotho	2800	0	22.0	11.0	0	67.0	0
Wotje	2875	0	25.0	0	1.9	71.3	1.8

Atolls in this category are very similar to the ones with the lowest capability. There is, however one major difference: many atolls in this category have a mix of functioning, which is a combination of kerosene and solar energy for lighting. It can be seen from Table 3a that on Utirik, 60% of the households use solar energy for lighting while about 38.5% use kerosene. In Wotho, 27.8% use solar and 72.2% use kerosene for lighting. The mix of kerosene and solar energy for lighting is found on most atolls in this group. The situation is different, however, on Jaluit, where 63.3% use kerosene and 35.8% electricity for lighting. Other atolls that do not quite fit the pattern are Mejit and Namdrik. On Mejit, there is a total reliance on kerosene for

lighting while on Namdrik, close to 95% of the households use solar energy for lighting.

Fuel source for cooking. With respect to fuel for cooking, it appears that the predominant source is wood. This would be true for Aur, Lae, Likiep, Mejit, Mili, and Utirik. The inhabitants on the remaining atolls—Arno, Jaluit, Maloelap, Wotho, and Wotje—use a mix of functioning: wood and, to a lesser degree, kerosene for cooking. Almost 69.6% of the households on Maloelap use charcoal for cooking while 11% in Wotho use propane gas for cooking (Table 3b).

Low-Level Capability

Fuel source for lighting. Inhabitants on atolls that have annual median incomes of less than USD1000 may appropriately be considered as having low-level capability. This low capability shows in the fuel sources used for lighting and cooking. The best indicator of the low level functioning is in the widespread use of kerosene for lighting. It can be seen from Table 4a that, on most of the atolls, less than 3% of the households have electricity for lighting. The most common fuel source for lighting is kerosene, that is, Ailinglaplap (86%), Ebon (93%), Lib (100%), Namu (94%), and Ujae (87%) still rely on kerosene. In some of the “luckier” atolls, like Ailuk, Arno, and Ujae, some households also use solar energy for lighting.

Table 4a. Median incomes (below USD1000) and fuel used for lighting: low-level capability.

Atoll	Median income (USD)	Electricity (%)	Kerosene (%)	Solar energy (%)	Others (%)
Ailinglaplap	838	3.4	86.0	9.7	.9
Ailuk	637	1.1	76.1	20.4	2.4
Ebon	984	0	93.4	6.6	0
Jabat	833	0	26.7	73.3	0
Lib	625	0	100.0	0	0
Namu	785	2.4	93.7	2.4	1.5
Ujae	683	1.5	86.6	11.9	0

Table 4b. Median income and fuel used for cooking: low-level capability.

Atoll	Median income (USD)	Electricity (%)	Kerosene (%)	Propane gas (%)	Charcoal (%)	Wood (%)	Others (%)
Ailinglaplap	838	0	5.0	4.0	19.0	72.0	0
Ailuk	637	0	5.7	0	0	90.9	3.4
Ebon	984	0	4.9	0	.8	94.3	0
Jabat	833	0	13.3	0	0	80.0	6.7
Lib	625	0	0	6.7	0	93.3	0
Namu	785	0	10.2	0	.8	88.2	.8
Ujae	683	0	7.5	1.5	0	91.0	0

Fuel source for cooking. The low-level capability also shows in the widespread use of wood for cooking. Here the low income correlates with a high percentage of households using wood for cooking (Table 4b). In Ailinglaplap, with a median income of USD838, 72% of all households use wood for cooking. Likewise in Ailuk, with an income of USD637 91% of the households, Ebon 984 has 94%, Jabat with 833 has 80%, Lib with 625 has 93%, Namu with 785 has 88%, and Ujae with an income of 683 has all of the households using wood for cooking. Interestingly on Ailinglaplap, 19% of the households still use charcoal for cooking. Much of this charcoal comes from coconut husks, which are plentiful on this atoll; having the largest stands of coconuts in the Marshall Islands.

Inter-Correlations of Variables Used in the Research

The Pearson product-moment coefficient of correlation analysis was undertaken in order to explore the inter-correlations between the capability and functioning variables. The results are reproduced in Table 5. It can be seen that the correlations support the observations made in the preceding paragraphs. High median income is negatively correlated with the use of kerosene for lighting ($-.62$) and wood for cooking ($-.77$). Other features worthy of noting are highly significant positive correlations between median incomes and electricity and kerosene for cooking.

Regression Analysis

Additionally, a regression analysis was used to predict variations in capability (median income as independent variable) from variables used to measure functioning (fuel variables as dependent variables). As noted earlier, capability is measured in terms of median incomes while functioning is based on fuels used for lighting and cooking. It was found that electricity for lighting (functioning) explained 75% of the variance of capability. Other significant dependent fuel variables were: wood and kerosene for cooking, which explained 64% and 49% of the variance (in capability), respectively.

Factor Analysis

Factor analysis is an interdependence procedure used in this research to assess interrelationships among the fuel variables and median income. As the objective of study is exploratory, principal component analysis using orthogonal (varimax) rotation was utilised to summarise data into a few components.

Interpretation of Factors

It was found that five factors explained 87.6% of the total variation with Factor 1 alone explaining close to 40% of the variation as shown in Table 6a. Factor 1 had high loadings on electricity for lighting (.98), median income (.94), electricity (.86), and kerosene (.67) for cooking. High negative loadings were noted for cooking with kerosene ($-.78$) and wood ($-.96$). As Factor 1 had the highest loading on

Table 5. Inter-correlation Matrix.

	Med-income	Elect-light	Kero-light	Solar-light	Other-light	Elect-cook	Kero-cook	Gas-cook	Coal-cook	Wood-cook	Solar-cook	Other-cook
Medincome	1.00											
Electlight	.86**	1.00										
Kerolight	-.62**	-.75**	1.00									
Solarlight	-.19	-.32	-.31	1.00								
Otherlight	-.04	-.05	.08	.01	1.00							
Electcook	.61**	.87**	-.64**	-.24	-.15	1.00						
Kerocook	.66**	.61**	-.39	-.27	.04	.24	1.00					
Gascook	-.14	-.13	.15	.01	-.24	-.07	.13	1.00				
Coalcook	-.01	-.06	.15	-.06	.07	-.13	-.03	-.17	1.00			
Woodcook	-.77**	-.93**	.65**	.34	.10	-.83**	-.71**	-.08	-.01	1.00		
Solarcook	-.11	-.16	.21	-.04	-.01	-.14	.01	-.26	-.03	.11	1.00	
Othercook	-.09	-.02	.08	-.07	.82	-.06	.03	-.14	.11	.01	.01	1.00

** Significant at .05 Level (2-tailed test).

Table 6. Factor analysis with varimax rotation.

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Communality h ²
Medincome	.94	.03	-.01	-.08	.09	.90
Electlight	.98	.09	.01	-.04	-.04	.97
Kerolight	-.78	.03	.59	.03	.03	.97
Solarlight	-.27	-.21	-.86	.01	.01	.87
Otherlight	-.13	.89	-.17	.22	.16	.93
Electcook	.86	-.03	-.07	-.09	-.18	.79
Kerocook	.67	.12	.29	.15	.28	.65
Gascook	-.04	-.47	.25	.72	.14	.84
Coalcook	-.16	.24	.24	-.14	-.81	.82
Woodcook	-.96	-.04	-.16	-.05	.07	.97
Solarcook	-.18	.10	0.22	-.75	.42	.84
Othercook	-.09	.90	-.06	.26	.04	.90
Eigenvalue	4.75	1.99	1.43	1.28	1.02	
% Variance	39.7	16.7	12.0	10.7	8.6	
Cumulative %	39.7	56.3	68.3	79.0	87.6	

electricity for lighting and median income, it might be appropriately labelled “electricity for lighting and median income” factor.

Factor 2 explained about 16.7% of the variation. It had a high positive loading from “other” sources for lighting (.89) and cooking (.90). Thus it might be referred to as “other fuels” factor. Factor 3 had high negative loading from solar energy for lighting (-.86) but a positive loading on kerosene for lighting (.59). This factor explained 12% of the variation. This factor, therefore, is labelled “kerosene for lighting” factor. Factor 4 explained 10.7% of the variation had a high positive loading on propane gas for cooking (.72) and a negative loading on solar energy for cooking (-.75). This factor is thus referred to as “propane gas for cooking” factor. Factor 5 explained the remaining 8.6% of the variation. Charcoal for cooking had high negative loadings (-.81) while solar energy had moderate positive loading (.42). This factor, therefore, may be identified as “solar energy for cooking” factor.

Discussion

The capability of the atolls to provide a decent annual median income is partly based on their resources and partly on the financial assistance provided by the US Government. Incomes generated through these sources are offset with a high degree of leakage from heavy imports of a wide range of goods, including food-stuffs, consumer goods, machinery and petroleum products.

While the annual median income of USD6839.83 (Butuna, 1999) might be considered relatively good, it is not evenly spread among the atolls. The atolls that are influenced by the United States defence projects enjoy a relatively higher income and with it have the benefits of a mix of functionings reflected in the use of modern fuel sources. These atolls also have the greatest population densities. Thus,

for the nation as a whole, 63% of all households use electricity for lighting, 31% use kerosene and 5.2% use solar energy. However, as noted earlier, the percentage using electricity for lighting varies widely among the atolls and islands. For example, all households on Kili use electricity for lighting while no household on Ebon, Jabat, Lae, Lib, Mejit, Namdrik, and Wotho do. On some atolls (Namdrik, Jabat, Utirik), solar energy is being used increasingly. Aside from Majuro and Kwajalein, which benefit greatly from US aid, kerosene is most commonly used for lighting on most atolls.

The poorest households had incomes below USD1000; with Lib Atoll recording the lowest median income of USD625.38. On atolls with relatively low capability, the functioning in terms of fuel sources for lighting and cooking remains rather primitive. For lighting, the atoll inhabitants rely on kerosene and wood for cooking. In contrast, the ones with greater capability, that is, with a median income of USD9030.17, 88.3% of all households use electricity and the remaining 11% use kerosene. On Kwajalein, which reaps the greatest benefits from the United States, 89.8% use electricity, while 9.6% use kerosene.

Examples of the effects of fuel poverty on well being and welfare are discussed below. Without clean and reliable supplies of energy, there is little opportunity for locals to pump water from wells, forcing locals to rely on water from dirty catchment tanks and lagoons polluted by human effluence. Further, in the absence of clean and reliable energy sources, wood is often used for cooking and good lighting. Additionally, absence of electricity hinders the operation of communication systems like radios and television sets.

In summary therefore it might be noted that although the cash economy is strong, particularly in urban centres like Majuro and Ebeye (on Kwajalein) subsistence remains the key to survival on the outer islands where the capability remains low. For the outer, distant atolls with a relatively low capability, fuel sources for lighting and cooking (functionings) might still be considered primitive: wood being predominantly used for both lighting and cooking. In the lesser remote atolls of transitional capability, wood is being gradually replaced by kerosene for lighting homes.

Conclusion

Annual median incomes and fuel sources provide a good measure of capability and functionings. Median income provides a fairer assessment of socioeconomic status than GNP per capita because the latter uses the mean in its calculations. The mean has one undesirable property in that it is affected by extreme values and thus would give a distorted picture of the socioeconomic conditions. This study, using median income, shows that there is a high positive correlation between capability and fuel usage for lighting and cooking. The high capability translates into a "mix" of functionings evidenced by the different combinations of fuel used for lighting and cooking.

One major problem with this study was the non-availability of data at the individual level. An effort was made to associate aggregated household median income

and fuel sources used at the household level. The links between capability set and individual choice within capability set (functionings) has been effectively posited by Laderchi, Saith, and Stewart (2003a,b). It has been suggested that Sen did not provide a specific list of minimal attributes, essential for the application of the capability approach. Thus, Alkire, quoted in Laderchi, Saith, and Stewart (2003a), has observed that the lack of specification was deliberate in order to allow room for choice across societies and ensure relevance of the approach to different persons and cultures. Seen from this perspective, it would be reasonable to suggest that capability and functioning constructs can be extended beyond the individual to household data. Limitations and problems inherent in ecological fallacy notions of confounding has been minimised through ethnographical work while aggregation bias has been minimized through numerical bounding of atolls by household median income and fuel sources.

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Spirituality as a Robust Empirical Predictor of Psychosocial Outcomes: A Cross-Cultural Analysis*

RALPH L. PIEDMONT

Spirituality and religiosity continue to be of interest to researchers and clinicians in the social and medical sciences because of the large number of Americans who currently profess a belief in God and consider themselves to be religious (e.g., Gallup, 1995). Rather than merely being idle beliefs, there is a rich and extensive network of research studies documenting the relationship between religious and spiritual activity and enhanced mental, physical, and social functioning. Thoresen (1999) provided an overview of these findings, and noted that those who were religiously and spiritually involved had: (1) higher levels of well-being and life satisfaction; (2) lower rates of depressive symptoms and suicide; (3) lower rates of divorce and greater levels of marital satisfaction; and (4) lower rates of alcohol and drug abuse. Piedmont (2004c) noted that levels of spirituality were predictive of therapeutic outcome in an outpatient substance abuse treatment program. Seeman *et al.* (2003) provided a critical review of the spiritual-religious/health linkage literature and found substantive support for concluding that involvement with the numinous is significantly linked to health-related physiological processes. Powell *et al.* (2003) noted in their review of the literature that among healthy individuals, involvement in religious services provided a consistent, prospective, reduction in risk for mortality. Finally, in their meta-analytic study, Sawatzky *et al.* (2005) noted a moderately strong relationship of $r = .34$ between spirituality and Quality of Life (QOL). Taken as a whole, the extant literature seems to convey a rather consistent effect for religious and spiritual constructs.

However, critics of the spirituality-health link identify numerous, methodological flaws in this body of research that they believe serves to limit their value. Sloan *et al.* (1999, 2001) noted that much of the research is based on simple correlational designs that lack any control for possible confounding variables and covariates. For example, Fredrickson (2002) believes that religious involvement's impact on health and well-being is due to its impact on the development of more

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positive emotions within a person. Joiner *et al.* (2002) asserted that religious activity is merely a stand-in variable for social support. Controlling for this factor removes any predictive effect for religion/spirituality (see also Smith, 2001). The overwhelming reliance on simplistic, cross-sectional correlational designs makes it difficult to determine whether spirituality and religiosity have any unique predictive power in their own right, or whether they merely “religify” already existing psychological variables. As Buss (2002) noted, “Religious phenomena may simply parasitize existing evolved mechanisms or represent byproducts of them” (p. 203).

Still other criticisms have centered on the empirical robustness of the findings. Sloan *et al.* also argued that these mostly zero-order relationships fail to control for the multiple comparisons that are performed in such studies, thus increasing the likelihood for Type I errors. Smith (2001) argued that the observed relationships with health outcomes may be artifactual; the product of a singular reliance on self-report data. For him, correlated method error (e.g., acquiescence, social desirability) may be responsible for the findings.

The purpose of this report is to address these concerns by providing a more rigorous examination of spirituality’s relatedness to a number of salient psychosocial outcomes. Using Structural Equation Modeling (SEM), this report will directly examine the potential mediating effect of personality using both self-report and observer-rated outcomes in both American and Filipino samples.

Measuring Spirituality

This study will employ as its measure of spirituality the Revised Spiritual Transcendence Scale (STS-R; Piedmont, 2004a). Spiritual Transcendence represents a basic motivational quality of all people that propels them to develop a broad sense of personal meaning within an eschatological context. In other words, Spiritual Transcendence addresses a basic existential question, “Knowing that we are going to die, how do we find a sense of purpose and direction for the lives we are leading?” Spiritual Transcendence motivates people to find answers to this question that allows them to see a broader sense of purpose and unity to life. Spiritual Transcendence creates a sense of self that transcends our immediate sense of time and space, and enables us to see life from a more unitive, interconnected perspective that goes beyond our mortal life span (see Piedmont, 1999, 2004a for definitions and conceptual development of the construct). Spiritual Transcendence is a universal aspect of spirituality, nondenominational in nature and culture free (Goodman, 2002; Piedmont *et al.*, 2002). The STS-R has shown itself to be psychometrically robust and independent of the personality dimensions of the Five-Factor Model of Personality (FFM; McCrae *et al.*, 1992). The STS-R is also the only measure of spirituality to have a rater form that has its own norms and established validity, thus enabling the collection and comparison of data across multiple information sources.

Methodological Issues

Three specific methodological issues will be addressed in this report: mediation, information source, and cultural specificity. Each will be discussed in turn.

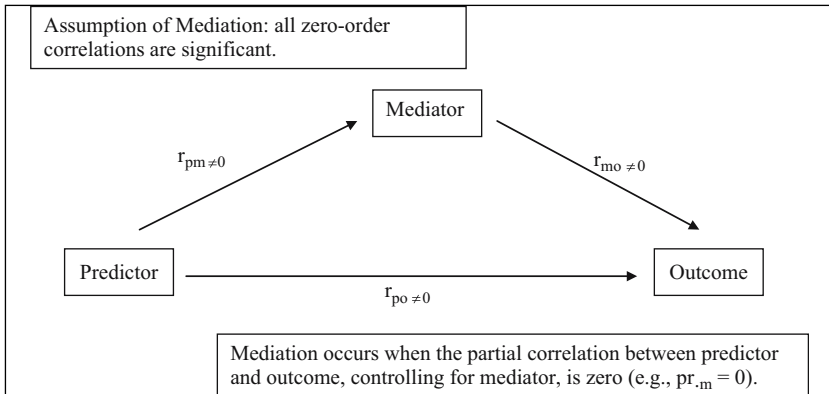


Fig. 1. Mediation model.

Mediation. Mediation is a statistical effect that occurs when the predictive value of a variable on an outcome is due entirely to the predictor's overlap with some third variable, which is itself correlated to the outcome (see Baron *et al.*, 1986 for an overview). This relationship is portrayed in Figure 1. As can be seen, all three variables (predictor, mediator, and outcome) are all significantly related to one another. Complete mediation occurs when the correlation between the predictor and outcome (r_{po}) drops to zero when the effect of the mediator (e.g., r_{pm} and r_{mo}) are controlled (i.e., removed). SEM provides two approaches to examining mediation: the Direct Mediation Model, and the Nested Model.

The Direct Mediation Model approach entails developing a causal sequence that parallels Figure 1. Such a scenario entails obtaining several observed variables that are believed to define the latent constructs of interest (For example, in this chapter the latent construct, *spirituality*, is defined by combining scores on the three facet scales of the Revised Spiritual Transcendence Scale. The latent dimension, *personality*, is defined by the combination of scores on the five dimensions of neuroticism, extraversion, openness, agreeableness, and conscientiousness. Finally, the latent dimension of *QOL* is defined by various scores from different measures). The coefficients (predictive weights) that are found among the latent variables (e.g., lambdas) are of interest here because they are all *partial coefficients* (analogous to beta weights found in multiple regression). If the coefficient between the predictor and outcome is significant, then complete mediation is not present.

The Nested Model approach provides a different perspective on the same issue. It examines the extent to which the observed correlation between spirituality and the psychosocial outcome is spurious (i.e., these two constructs correlate because they share a common cause). This method involves the comparison of two, nested models (i.e., one model subsumes another). These relationships are outlined in Figure 2. The first model involves testing the model adequacy of a single primary predictor (i.e., the mediator) influencing both the outcome and a secondary predictor (i.e., the original predictor). This model assumes that the secondary predictor has no direct effect on the outcome. The Chi-square goodness of fit

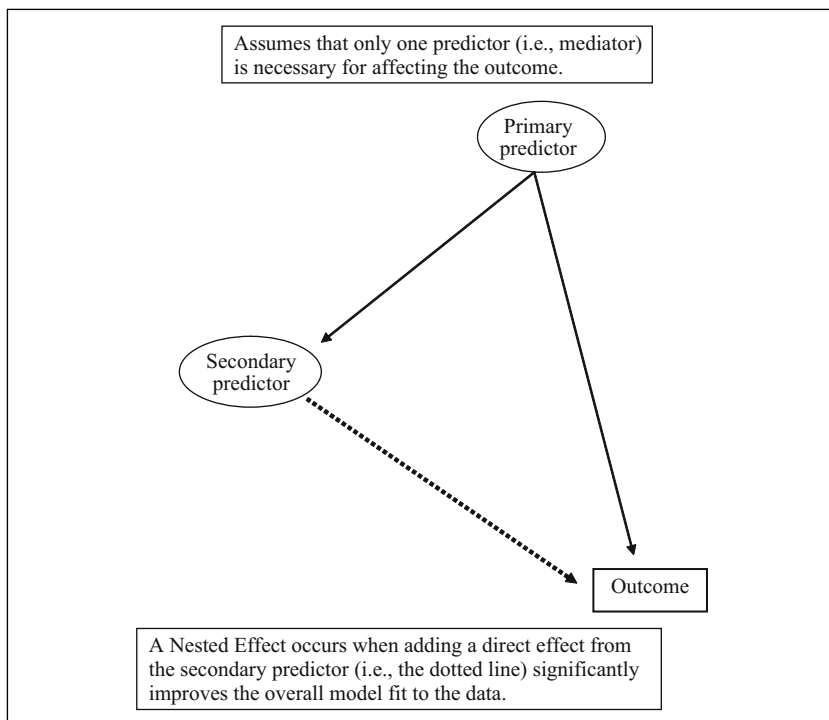


Fig. 2. Nested model.

statistic is obtained. The second step is to create a model, similar to the first, which has a direct causal path from the secondary predictor to the outcome. This model assumes that this variable does have a direct effect on the outcome (the dotted line in Figure 2). Again, the Chi-square fit statistic is obtained. Because this second model was nested in the first, the change in the Chi-square statistic is a direct index of spuriousness. If the change in the Chi-square is significant, this indicates that adding the direct path significantly improved model fit, and hence the observed relationship between spirituality and outcome is *not spurious*; spirituality has a unique relationship with the psychosocial outcome.

The value of SEM for examining mediational and spurious effects is threefold. First, SEM is able to test all the relevant paths simultaneously and directly. Second, SEM directly controls for all types of measurement error, allowing for a more accurate estimate of each variable's relationship to the others. Finally, although SEM is an experimental type method that presupposes causal relationships, its use with correlational data is appropriate and in fact provides a robust evaluation of mediation (Baron et al., 1986). Because causal directionality is implied in this technique, using two different approaches allows for different ways of conceptualizing the relations between the predictor and mediator. Thus, both the nested and mediational models will be used in this study.

Self-Report Data. As noted above, Smith (2001) pointed out that most medical research using religious and spirituality constructs relied heavily on self-reports. Using self-report data for both the predictor and outcome raises issues of correlated method error. Whatever reporting biases exist in one measure will also exist in the other, creating a spurious correlation. Thus multi-modal assessments are necessary in order to determine a more accurate level of overlap between the two sets of constructs.

Observer reports provide such a useful platform for examining convergence. Showing that what people have to say about themselves agrees with what others have to say about them, is a powerful way of demonstrating validity. Although both self-reports and observer ratings have their inherent limitations, these shortcomings or biases do not overlap with each other. Thus, correlations between a self-report and an observer rating cannot be spuriously inflated by correlated method error. This study will employ both sources of measurement. Self-reported scores on the STS-R will be related to observer ratings on a variety of outcome criteria. Demonstrating significant direct effects for spirituality would provide more compelling empirical evidence for the robustness of spirituality's predictive effect.

Cross-Cultural Issues. A final area of concern relates to the cultural bias that exists in contemporary research. The vast majority of work centers on the application of Western European based measures of spirituality with, mostly, European subjects. There are larger conceptual issues here to be addressed, such as the generalizability of current measures of spirituality to non-Western cultures and faith groups. Do current models represent generalizable, universal aspects of faith and spirituality, or are they more culturally specific expressions of existential concern? More specifically, it is necessary to determine whether the relationships between spirituality and health (both mental and physical) would be observed in cultures less conforming to European notions of spirituality and health. Demonstrating a cross-cultural replication of spirituality's unique, predictiveness of mental health outcomes would add to the empirical value of this construct for understanding people. This study will include a general sample of Filipino adults, who will have taken the STS-R in their native language, Tagalog. There are two advantages to using a Filipino sample for this cross-cultural analysis. First, the Philippines is mostly a Christian nation (Roman Catholic), thus making these individuals comparable in religious affiliation to the American sample. Second, as an Asian nation, the Philippines has been shown to possess a more collectivistic culture than the United States (Grimm *et al.*, 1999). Do the very different personal and social values of the Philippines mitigate spirituality's impact?

If spirituality is to be considered a psychologically important construct, it will need to demonstrate some universal capacities. It is the intent of this study to demonstrate spirituality's ability to predict a wide range of psychosocial outcomes, independent of the personality dimensions of the FFM, which are also powerful predictor of these same outcomes. The robustness of this effect will be demonstrated in both self-report and observer rated outcomes, in two culturally distinct samples.

Method

Participants

American Sample. Consisted of 397 individuals (274 women, 117 men), ages 17–62 (Mean = 21.3 years). Participants were graduate and undergraduate students in psychology and pastoral counseling obtained from Massachusetts, Maryland, Mississippi, and Illinois. Over 85% of the sample was Christian, 6% being atheist or agnostic, 2% Jewish, 2% Muslim, Hindu, or Buddhist, and 5% indicating an “Other” religious affiliation. Concerning race, 88% were Caucasian, 5% African-American, 4% Hispanic, 3% Asian. These individuals were asked to obtain two individuals who have known them for at least 3 months to provide ratings on select measures. Twenty-four participants failed to return any ratings, 35 returned a single rater, while 338 returned two ratings. Of these 711 raters, 445 were women and 266 were men. On average, raters knew their target for 8.33 years (range 1 month to 59 years). Raters were asked to indicate on a seven-point Likert-scale how well they knew the target (1 being *not at all*, 7 being *excellent*), and the mean rating was 6.2 (range was 1 to 7). Ratings were aggregated across the two ratings and these composite scores were used in all analyses.

Filipino Sample. Consisted of 574 adults (391 women and 174 men, 9 indicated no gender), between the ages of 17 and 75 (Mean = 30 years). Concerning religious affiliation, 91% were Roman Catholic with 6% indicating some Christian faith, with 2% indicating “Other.” Individuals were a mixed group of single and married adults from the cities of Manila and Makati City both on the island of Luzon, which is the largest island in the Philippines. Other individuals were recruited from Ateneo de Davao University and comprised both undergraduate and medical students. A subset of the participants were asked to obtain two raters who have known them for at least 3 months. A total 224 individuals returned two ratings, 55 returned one. Of those indicating a gender, 296 were women and 156 were men ranging in age from 16 to 63 (Mean = 26 years). In terms of how well raters knew their targets, mean ratings were 5.22 on the seven-point Likert-scale. Again, ratings were aggregated to form a single composite.

Measures

Spiritual Transcendence Scale-Revised (STS-R). Developed by Piedmont (2004a) this a 23 item measure of spirituality contains three subscales: *Universality*, the belief in an overall, unitive purpose for life, *Prayer Fulfillment*, the ability to create a personal space that enables one to feel a positive connection to some larger reality; and *Connectedness*, feelings of belonging and responsibility to a larger human reality. This scale possesses adequate reliability and has been shown to correlate with a variety of psychosocial criteria, even after the predictive effects of personality have been controlled (Piedmont, 2004a). The Filipino sample completed this scale in their native language, Tagalog. Piedmont (2004b) has shown this translated version to be reliable and valid as well as being metrically equivalent to its English cousin.

Bipolar Adjective Rating Scale (BARS). Developed and validated by McCrae *et al.* (1985, 1987), this 80-item scale is designed to capture the FFM domains of adult personality, namely, Neuroticism (N), Extraversion (E), Openness (O), Agreeableness (A), and Conscientiousness (C). The scale has also been shown to be reliable and structurally valid with college students (Piedmont, 1995). Responses are measured on a one- to seven-point Likert-type scale, and FFM domain scores are found by summing the responses to items for each domain.

The Purpose in Life Test. Developed by Crumbaugh (1968), this 20-item scale measures a person's "will to meaning" as construed by Victor Frankl (1966). Responses are given on a seven-point Likert-type scale, the poles of which vary according to the question. Research has shown this scale to be related to psychological well-being (Zika *et al.*, 1992) and ability to cope successfully with the death of a significant other (Pfoest *et al.*, 1989).

Attitude Towards Abortion. This is a single-item nine-point bipolar scale designed to capture the subject's attitude toward abortion from "very pro-abortion" (-4) to "very pro-life" (+4).

Individualism/Collectivism Scale. Developed by Dion *et al.* (1991), this 15-item scale is an index of how much a person feels himself or herself as being a part of a larger community or group. Items are answered on a 1 (*Strongly Agree*) to a 5 (*Strongly Disagree*) Likert-type scale.

Delighted-Terrible Scale. This scale was developed by Andrews *et al.* (1976) as a cognitive measure of global well-being. Participants rate their overall level of life satisfaction on a Likert scale of 1 (*terrible*) to 7 (*delighted*).

Prosocial Scale. Developed by Rushton *et al.* (1981), this 20-item scale captures altruistic behavior. Individuals rate the frequency with which they have engaged in altruistic behaviors on a five-point Likert type scale ranging from *never* to *very often*. Rushton *et al.* provide alpha reliabilities in five samples ranging from .78 to .86. Significant peer-self correlations were also obtained, while correlations with a measure of social desirability were nonsignificant. Rushton *et al.* also demonstrate significant convergence of the Prosocial Scale with both tests (e.g., Emotional Empathy Scale and the Social Interest Scale) and actual behaviors (e.g., volunteering to read to blind persons in response to a telephone solicitation).

Self-Actualization Scale. Created by Jones *et al.* (1986), this scale provides a measure of Maslow's highest level of development. The 15 items are responded to on a 1 (*disagree*) to 4 (*agree*) Likert-type scale. Jones *et al.* (1986) have found that high scores on this scale are associated with individuals being extraverted, rational in their thoughts and behaviors, and inner-directed.

Bradburn Affect Balance Scale. Developed by Bradburn (1969), this 20-item true-false scale captures these dimensions of affective well-being: Positive Affect

(PAS), Negative Affect (NAS), and Affect Balance (NAS subtracted from PAS). Studies have shown the PAS and NAS scales to represent independent dimensions (Bradburn, 1969; Costa *et al.*, 1980). Scores on these scales have been shown to correlate with global well-being (Costa *et al.*, 1984).

Sexual Attitudes Scale. This is a 21-item scale developed by Fisher *et al.* (1988) to capture attitudes about sexuality. The overall dimension that arises from this scale reflects sexual attitudes ranging from very erotophobic (negative attitudes toward sex) to very erotophilic (positive attitudes toward sex). Items are responded to on a seven-point Likert scale from “strongly agree” to “strongly disagree.”

Satisfaction with Life Scale (SWLS). Developed by Diener *et al.* (1985), this five-item scale captures cognitive aspects of one’s satisfaction with life at the current moment. Responses are made on a seven-point Likert-type scale from “Strongly Disagree” to “Strongly Agree.”

Rosenberg Self-Esteem Scale. Developed by Rosenberg (1979), this scale is designed to capture levels of personal self-esteem. The ten-item scale is responded to on a four-point Likert-type scale, with answers ranging from “strongly agree” to “strongly disagree.” The scale has been widely used with both adolescent and adult samples.

Social Support Scale: For the purposes of this paper, only the four items for the Religious Support Scale from the *Brief Multidimensional Measure of Religiousness/Spirituality* (The Fetzer Institute/National Institute on Aging Working Group, 1999) were used. These items query the amount of interpersonal support and encouragement one receives from other members of one’s congregation. Thus the instrument not a measure of spirituality per se, rather it reflects social involvement in an identified reference group.

Procedure

All participants completed their materials individually. They were instructed to answer questionnaires in the order presented. The order in which scales were completed was counterbalanced (i.e., randomized) to control for order effects. Participants contacted raters directly and provided them with an envelope containing the research materials. Raters completed their forms independently and then directly returned their materials to the research coordinator.

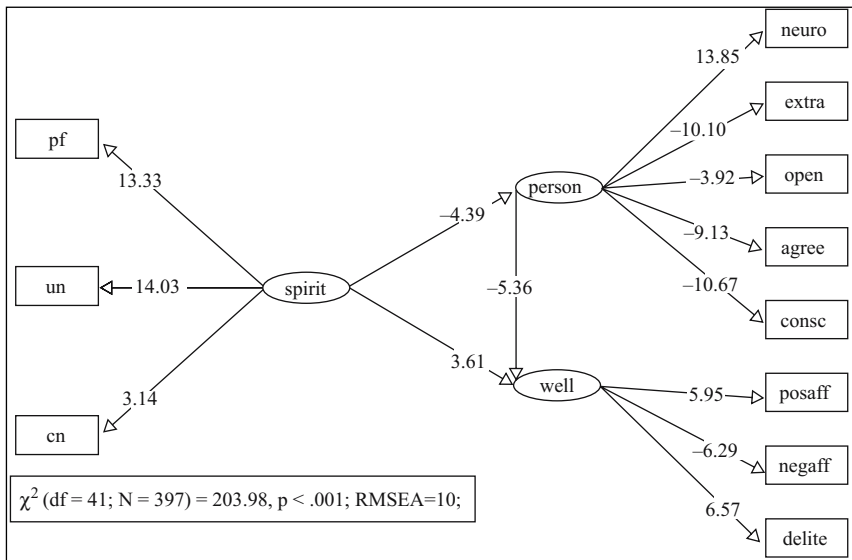
The samples included in this chapter were taken from two research projects having different aims. Thus, these two studies incorporate only a subset of variables in common. When SEM models using the same variables are tested in these two samples, a direct estimate of replication can be obtained. Where the models use slightly different sets of variables, the results need to be interpreted more heuristically. The note for Table 3 outlines the similarities and differences in variable usage for the tested models across the two samples.

Results

The Appendix contains descriptive statistics for all variables used in the analyses presented here for both samples. LISREL 8.14 was used for the SEM analyses. Because these data are essentially interval in nature, the generalized least squares (GLS) algorithm was employed for estimating all model parameters.

The first series of analyses employed SEM to examine mediational effects for the self-reported outcomes in the American sample (see Figure 1). Four latent outcome dimensions were examined: well-being, psychological growth, attitudes towards sexuality, and social orientation. In these analyses, the subscales of the STS-R defined Spirituality, while scores on the personality domains of the FFM defined Personality. For the purposes of this report, what is of importance is the *combined effect* these various subscales have on the outcome criteria rather than their individual contributions. The result of the analysis for well-being is presented in Figure 3. The reader should not interpret the straight lines from spirituality to personality as indicating cause. Rather, all the lines in the model represent hypothesized *correlational and partial correlational* relationships.

Values presented in this figure are t-scores, and test whether a specified path contains a significant loading. Values less than 1.96 are non-significant. In each analysis, the value to examine is for the path linking “Spirit” with the outcome. This



Values presented in above figure are t-scores. pf = STS-R Prayer Fulfillment; un = STS-R Universality; cn = STS-R Connectedness; neuro = Neuroticism; extra = Extraversion; open = Openness; agree = Agreeableness; consc = Conscientiousness; posaff = Bradburn Positive Affect; negaff = Bradburn Negative Affect; delite = Delighted-Terrible Scale.

Fig. 3. Mediational model examining spirituality predicting self-reported psychological well-being in an American sample.

Table 1. Results of mediational analyses for spirituality for both self- and observer-rated outcomes in the American sample.

Outcome	Direct effect for spirituality controlling for personality <i>t</i> -value
Self-reports	
Growth ^a	2.12*
Sexual attitudes ^b	-4.29**
Social support ^c	-2.90*
Observer ratings	
Well-being ^d	2.93*
Attitudes: Abortion ^e	2.50*

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

N for self-reports = 397; *N* for observer ratings = 388.

^a Growth defined by Self-Actualization; Self-Esteem; and Purpose in Life scales.

^b Sexual Attitudes defined by Erotophilic Attitude towards Sexuality; Erotophobic Attitude Towards Sexuality; attitude towards abortion from pro-choice to pro-life.

^c Social Support defined by Individualism/Collectivism Scale; Social Support Scale; and Satisfaction with Life Scale.

^d Well-being defined by Bradburn Positive Affect; Bradburn Negative Affect; Delighted-Terrible Scale.

^e Attitudes towards Abortion defined by the single rating on the likert scale.

path represents the direct contribution of spirituality to predicting the outcome, controlling for the effects of personality. A significant value indicates that spirituality makes a unique contribution to the outcome; its effect is not mediated by personality. As can be seen in in Figure 3, the path from “spirit” to the criterion is significant.

Table 1 presents the results for the remaining outcome variables. This table provides the *t*-value for the path linking spirituality to the outcome criterion. As can be seen, for each of the self-reported outcomes, spirituality makes a unique, significant contribution to the outcome. In order to provide some evidence that these effects are not merely spurious associations, observer ratings on well-being and attitudes towards abortion are used as the criteria. Any associations here cannot be attributed to correlated method error. As can be seen in Table 1, in both instances, spirituality makes a significant, unique contribution to the outcomes. Personality does not mediate spirituality’s effect, spirituality provides predictive power into these outcomes over and above any contribution of personality.

To provide a different way of analyzing these data, nested effects models are examined. As outlined in Figure 2, the nested effect attempts to demonstrate that adding a direct effect from spirituality to the outcome (i.e., the dotted line) significantly improves the overall fit for the entire predictive model. The actual change in Chi-square from the null, or indirect effects model (i.e., spirituality does not directly predict the outcome) to the direct effects model (i.e., spirituality does directly predict) can itself be tested for significance. A significant decrease would indicate that spirituality evidences incremental validity; it predicts an outcome *over and above* any predictiveness afforded by personality.

Table 2. Results of structural equation modeling analyses using a nested model approach in the American sample.

Outcome variable	Nested model Chi-squares		$\Delta\chi^2$
	χ^2 Spirituality: Indirect effect	χ^2 Spirituality: Direct effect	
Self-report data			
Well-being	218.45	203.98	14.47**
Psychological growth	100.76	100.11	.65
Social support	233.18	212.38	20.80**
Sexual attitudes	152.30	139.01	13.29**
Observer rating data			
Well-being	159.48	151.23	8.25*
Abortion	133.14	105.18	27.96**

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

Figure 2 graphically presents the effects being tested here. The goal for testing the "Nested Effect" is to determine whether adding a direct effect for Spirituality significantly improves overall model fit. Is $\Delta\chi^2$ Significant? The critical value for Chi-square with 1 df is 3.841 at the .05 alpha level and 6.635 at the .01 alpha level.

Table 2 provides the results of these analyses. The outcome criteria used above were again employed in these analyses. Column 2 provides the model Chi-square for when spirituality is not linked as a direct predictor. Column 3 gives the model value when spirituality is a direct predictor. The final column indicates the change in Chi-square values, which itself can be tested for significance (with $df = 1$). As can be seen, in all but one instance, the nested effect is significant; spirituality evidences incremental validity. This is observed with both the self-report and observer-rating data. The weight for the direct pathway from spirituality to the outcome ranged from .20 for observer rated well-being to .73 for observer rated scores on Abortion, with a median value of .27. To put these values in a different interpretive context, overall, for every four standardized point increase in spirituality, scores on the QOL measure will increase by one standardized point.

To demonstrate the robustness of these findings, similar analyses were conducted with the Filipino sample. Comparable information was available for several of the above criteria. Column two of Table 3 provides the results of the mediational analyses. The values presented are the t-values for the direct paths from spirituality to the outcome. In each instance, spirituality evidenced a significant effect. Again, spirituality's predictive effect was not mediated by personality.

These analyses were repeated employing the nested model approach outlined above and these results are presented in Table 4. As can be seen, spirituality evidenced significant incremental validity over personality in predicting these outcomes. The path coefficients for the direct pathway from spirituality to the outcome ranged from .20 for self-rated well-being to .38 for both self-rated growth and interpersonal style, with a median value of .35. For the Filipinos, the effect size is slightly higher, where overall a three standardized point increase in spirituality was associated with a one standardized point gain on the outcome dimension.

Table 3. Results of mediational analyses for spirituality for both self- and observer-rated outcomes in a Filipino sample.

Outcome	Direct effect for spirituality controlling for personality <i>t</i> -value
Self-reports	
Well-being	3.23**
Growth	5.36**
Interpersonal	5.17**
Observer ratings	
Well-being	2.49*

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

N for self-reports = 574; N for observer ratings = 249. The variables defining the well-being dimension were the same as those employed in the American sample. The Interpersonal criterion was defined by scores on the Individualism and Materialism scales. The Growth dimension was defined by scores on the Self-actualization, Purpose in life, and Prosocial behavior scales.

Figure 1 graphically presents the effects being tested here. Mediation occurs when the pathway from spirituality to the outcome is zero. A significant pathway would indicate that mediation is not occurring.

Table 4. Results of structural equation modeling analyses using a nested model approach for the Filipino sample.

Outcome variable	Nested model Chi-squares		
	χ^2 Spirituality: Indirect effect	χ^2 Spirituality: Direct effect	$\Delta\chi^2$
Self-reports			
Well-being	224.77	210.03	14.74**
Growth	317.10	268.64	48.46**
Interpersonal	275.65	236.87	38.78**
Observer ratings			
Well-being	161.85	136.97	24.88**

** $p < .001$.

N for self-reports = 574; N for observer ratings = 249. The variables defining the Well-being dimension were the same as those employed in the American sample. The Interpersonal criterion was defined by scores on the Individualism and Materialism scales. The Growth dimension was defined by scores on the Self-Actualization, Purpose in Life, and Prosocial Behavior scales.

Figure 2 graphically presents the effects being tested here. The goal for testing the “Nested Effect” is to determine whether adding a direct effect for Spirituality significantly improves overall model fit. Is $\Delta\chi^2$ Significant?

Discussion

The major issue raised by critics of spiritual and religious research is whether numinous variables represent important, nonredundant aspects of people or are these variables merely a “repackaging” of existing psychological constructs. This is perhaps the central question that needs to be addressed by researchers in this area. If the latter, then religious constructs do not provide any new information about people and are merely stand in variables for other, more powerful concepts. However, if numinous constructs do represent aspects of people heretofore not represented by traditional psychological constructs, then a whole new frontier of understanding awaits exploration. Research with numinous constructs may help to expand current models of psychological functioning and identify new methods for clinical intervention.

However, before becoming overly exuberant about these possibilities, there are numerous methodological issues that need to be addressed. First, psychometrically sound measures of numinous qualities need to be developed. Gorsuch (1984) has noted the rather abysmal state that exists concerning instrumentation in this field. Few instruments possess sufficient documented validity to be considered useful. The STS-R, used in this report, is one instrument with extensive psychometric support (see Piedmont, 2004a). Second, models of spirituality and religiosity need to be adapted to fit with current psychological models. Theologically based approaches will not find useful applications in the social and medical sciences. Numinous realities need to find a scientifically acceptable grounding. The Spiritual Transcendence scale operationalizes spirituality from a motivational/trait model and is very amenable to empirical analysis. Finally, research needs to document the incremental validity, or added value, of numinous constructs over existing psychological constructs (e.g., Dy-Liacco *et al.*, 2006). The central question to be answered is, “What is it the spiritual/religious constructs tell us about people that established variables do not already provide?”

The study reviewed here attempted to address this issue directly. Using multiple information sources (self vs. observer) and multiple samples (American vs. Filipino), it was demonstrated that an empirically sound measure of spirituality does indeed provide additional predictive power over an established, multidimensional model of personality. Although spirituality may not explain all the variance in an outcome, or even the lion’s share, it does add a statistically (and practically) significant amount of explained variance. In the current study, the magnitude of this contribution was about $r = .30$, a moderate sized effect that is consistent with results obtained from meta-analyses (e.g., Sawatsky *et al.*, in press). Spirituality does add enough predictive power so that any comprehensive model of the person must include a numinous component.

What is perhaps most interesting about spirituality is its relevance to such diverse outcomes. There are few single constructs that have such a wide range of predictive convenience. Research here and elsewhere (e.g., Piedmont, 2001, 2004c) has shown spirituality’s relevance to overall levels of well-being, interpersonal style, self-esteem, sexual attitudes, and psychological maturity. Spirituality has also been shown to be a significant predictor of outcome in an outpatient substance

abuse treatment program. These findings are not merely zero-order correlations, but emerge from rigorous incremental validity analyses that aim to control for potential mediation effects. The current study should give researchers more confidence in spirituality's utility as a useful psychological construct. The predictive relationships noted here cannot be dismissed as merely correlated error or even a culture specific effect. Spirituality does add something new to our understandings. Perhaps some modicum of exuberance is warranted!

Future research will need to expand on these findings by incorporating different types of spiritual and religious scales, more diverse outcome criteria, and different cultural and religious groups. Such work will help to fully demonstrate spirituality's robust predictiveness as well as its ability to foster well-being and resiliency. If the data presented here are indeed correct, then spirituality can be recognized as a universal, species-specific aspect of the human experience. Spirituality may ultimately be shown to be the psychological cord that ties together the many components of one's mental world into a more solidly integrated bundle.

Appendix: Descriptive Statistics For All Variables in Both the American and Filipino Samples.

Variable	American sample		Filipino sample	
	Mean	SD	Mean	SD
<i>Self-report</i>				
Neuroticism ^a	49.92	9.32	48.52	8.71
Extraversion^a	52.41	9.07	48.77	8.67
Openness ^a	50.43	10.08	49.98	8.79
Agreeableness ^a	51.89	8.89	50.60	9.41
Conscientiousness^a	48.36	9.97	45.58	11.57
Prayer fulfillment	36.15	8.32	32.74	4.30
Universality	24.94	4.14	35.75	4.56
Connectedness	22.62	3.36	22.96	2.92
Positive affect	4.14	1.01	3.36	1.32
Negative affect	3.15	1.46	1.15	1.32
Self-actualization	43.73	5.29	43.89	5.42
Self-esteem	31.12	4.80		
Prosocial behavior	52	11.16	52.39	11.21
Optimism	24.41	3.15		
Purpose in Life	106.12	13.64	106.63	16.44
Individualism/collect	37.98	6.79	40.47	6.36
MMRS Social Support	21.67	5.46		
Erotophilia	44.08	10.48		
Erotophobia	44.23	11.63		
Satisfaction with Life	25.63	5.71		
Delited/terrible score	5.40	1.05	4.94	1.26
Hope	37.59	5.91	69.97	6.91
Attitude on abortion	5.77	2.84		
Materialism				

Variable	American sample		Filipino sample	
	Mean	SD	Mean	SD
<i>Observer ratings</i>				
Positive affect	4.29	.86	3.66	1.13
Negative affect	2.58	1.27	1.42	1.24
Delited/terrible score	5.49	.95	4.72	1.13
Attitude on Abortion	6.29	2.24		
Individualism/collect	39.58	5.62	42.82	4.68
Self-actualization	43.28	4.71	41.63	4.05
Satisfaction with Life	25.31	4.78		
Prosocial behavior	48.79	10.03		

^a Scores presented are T-scores (Mean 5 50, SD 5 10). Based on norms provided by Piedmont, 1995.

Variables in bold indicate a significant mean difference in scores between the American and Filipino samples at $p < .01$, two-tailed.

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Hope and Spirituality in the Age of Anxiety

ANTHONY SCIOLI

Introduction

“In the Middle Ages, a favorite image is the wheel of fortune . . . if you are attached to the rim of the wheel of fortune, you will be either above, going down, or at the bottom, coming up. But if you are at the hub, you are in the same place all the time . . . centered.”

Joseph Campbell, *The Power of Myth*

“Quality of life” (QOL) covers a vast conceptual terrain. Two thousand years ago, the ancient Greeks debated the meaning of what is “good.” Plato called for harmony within the tri-partite soul. As he saw it, a quality existence derived from a proper admixture of reason, passion, and will. In *The Nichomacean Ethics*, Aristotle introduced the “golden mean” and warned against the vices of “deficiency” and “excess.” Seneca and other stoic philosophers touted a life of “rational serenity” unruffled by “unruly passions” such as anger or fear.

In the twenty-first century, scientists, administrators and political leaders, continue to grapple with this issue. The breadth of perspectives and topics in this volume is a testament to the continuing search for the most appropriate QOL “indicators.” Economists monitor the quality of employment and educational opportunities as well as the presence of adequate food and shelter. Health officials concentrate on matters of disease control and quality of life among the ill or infirm. Sociologists assess the quality of family life and the presence of “community.”

Deviating from the search for “social” or “economic” indicators, psychologists have tended to highlight “subjective well-being” or “happiness.” Going even further, Diener and Seligman (2004) have suggested that psychological indicators of QOL might even be more relevant today than economic indicators. From their perspective, economic variables are most salient when national resources are scarce. In contrast, when scarcity is no longer the norm but the exception, “national well-being measures” relating to happiness or life satisfaction might serve as the most relevant QOL indicators. In support of their “satisfaction thesis,” Diener and Seligman, point to such signs of “slippage” as the increasing levels of depression,

distrust, and alienation among individuals living in countries that are witnessing a rise in economic indicators.

In truth, the world is not one “place.” Although I believe they overstate the degree of “rising abundance,” their notion of “slippage” is on the mark. There is widespread distress and despair among the masses. Sociopolitical tensions are rising and the threat of catastrophic acts of terrorism has never been higher. Indeed, it is the sum of all these woes that makes this a particularly “turbulent” time.

In reflecting further on the satisfaction thesis of Diener and Seligman, I find myself both in agreement and disagreement. A full account of QOL must certainly include its subjective elements. Several decades of empirical research has shown that demographic variables are poor predictors of outcomes such as “happiness” or “subjective well-being” (Watkins, 2004). However, I diverge somewhat from Diener and Seligman in selecting “hope” as the primary indicator of subjective QOL.

The Importance of Hope

Hope is one of the great virtues. It prompted our Neanderthal ancestors to adorn the graves of their deceased kin with supplies for the afterlife. The ancient Greeks made sure that hope remained in Pandora’s box of earthly ills. Within the Judeo-Christian tradition, hope has long been recognized for its special powers. Saint Paul placed it alongside faith and love. “For now we see in a mirror darkly, but then face to face . . . So faith, hope, love, abide, these three.” If you were to read the Bible from cover to cover, you would find that the word “hope” appears over 180 times or approximately once every seven pages. Christians, however, are not the only ones sustained by hope. Buddhists, Hindus, and Jews as well as the followers of Mohammed, the African Ifa, Native Americans and the Australian Aborigines draw their “spiritual light” from hope-oriented belief systems.

Hope has been hailed by thinkers of every age from Aristotle to Marcel. It has been endorsed by the spiritually-minded as well as the most atheistic philosophers and scientists. Practitioners of every healing art have prescribed Hope. For modern scholars such as Erikson, Frank and Marcel, there is no greater ally. Erikson (1950) characterized hope as the first virtue of infancy and saw despair as the greatest challenge of old age. Jerome Frank (1968) plumbed 25 years of psychotherapy research for a common curative factor and emerged with hope. Marcel (1962) believed that the dying individual who retains hope realizes in the “depth of their being . . . a liberty and faculty of relaxing.”

For more than a decade, Snyder (1991, 2004) has been promoting a “hope-centered” approach to positive psychological functioning. Vaillant (2002) has argued that hope, particularly of a spiritual nature, is essential for “aging well.” Carr (2004) includes “hope and optimism” as among the most important emotions underlying subjective well-being.

Hope is especially important in dealing with stress and adversity. In the Oxford English Dictionary, one of the earliest definitions of hope is that of a “safe island in the midst of a wasteland”. William Cowper, the eighteenth century poet,

dubbed it “an anchor firm and sure, (that) holds fast the Christian vessel and defies the blast.” In more psychological terms, hope can be defined in part, as a positive perceptual bias that facilitates the discovery and retention of favorable future outcomes. [The stress investigator Shlomo Breznitz (1986) refers to this as the “work of hope”] Further evidence of hope’s buffering action comes from psychologist James Averill (1990) who relied on a variety of informal “factor analytic” techniques to cull “metaphors of hope.” The process involved sifting through hundreds of classic hope quotes and proverbs as well as everyday expressions in an effort to elucidate the phenomenological core of hope. Consistent with the earlier observations, Averill found that two of the most common ways that individuals experience hope is as a “bridge” (to a better place) as well as a “protected area.”

The Nature of Hope

Hope is best viewed as a socially constructed emotion. Following Averill’s (1997) approach to theory-building, hope is conceptualized as a multi-level system that is primarily organized by social principles of organization. To capture the full spectrum of hope-related thoughts, feelings, and behaviors, it is necessary to posit five levels (see Table 1 below).

Table 1. Hope as a multi-level system.

Levels	Motives underlying hope and selected derivatives		
1. Biological systems	<i>Attachment</i>	<i>Mastery</i>	<i>Survival</i>
2. Endowments (Care/support)	Basic Trust Openness (Presence)	Curiosity Planning (Empowerment)	Defenses Coping skills (Salvation)
3. Hope traits	<i>The Attached Self</i> Relational trust Openness <i>The Empowered Self</i> Goal-related trust, Will to hope, Mediated power <i>The Resilient Self</i> Survival-oriented trust, Terror management capacities, Symbolic immortality		
4. Faith system	Faith Options (Investment in one or more “Centers of value”) (e.g., higher power, nature, science, government, other people)		
5. Hope expressions	<i>Beliefs</i> Continued presence Continued support Benign universe <i>Feelings</i> Connected Empowered Serene <i>Actions</i> Trusting, open Goal pursuits Recruiting care		

Level 1: Hope Motives

The first level of the hope foundation consists of the biological motive systems relating to mastery, attachment and survival. Present at birth, these are *the genetic blueprints for hope*. It is human nature to look for a better tomorrow, to seek a permanent union and to find a safe haven. These motives are complex and like most human behaviors draw on multiple brain areas. At the same time, there is overwhelming evidence that certain neural circuits are primarily designed to support particular motive systems. While a detailed discussion of these elements is beyond the scope of this chapter, a brief overview is possible.

The *mastery infrastructure* includes the frontal lobes (initiative and planning) and hippocampus (goal-related memories) as well as the reticular formation (general arousal) and various excitatory neurotransmitters (specific arousal). The *attachment system* features a circuit in the front, left region of the brain that facilitates detection of facial expressions and emotional intonations. Other elements include the hormone Oxytocin, dubbed the “cuddle chemical” for its role in promoting social behaviors such as nest building, protection of the young and embracing. The *survival components* include a complex immune system as well as involuntary reflexes for avoiding sudden dangers. Parts of the Amygdala provide a basis for fear and anxiety by facilitating detection of harmful stimuli. The “stress response” assures a boost of neurotransmitter activity for short-term confrontations as well as a back-up supply of hormonal release for extended struggles. To calm the organism during harmful encounters and to prevent excessive vigilance and fear, Gamma Amino Butyric Acid (GABA) is dispensed, creating a state of relaxation and diminished pain.

Level 2: Endowments and Supports

The motives that underlie hope assure that human beings will be primed for further developments related to attachment, mastery and survival. Some individuals possess more or less of these capacities. But regardless of their “natural endowments,” individuals will require support and guidance to realize their potential for goal-achievement, intimacy, and self-regulation. Family, culture and spiritual beliefs may all play a vital role in this process.

Mastery requires determination as well as a guiding hand. In the Western world the need for formal apprenticeships and spiritual guidance receives far too little attention. In contrast, followers of the Hindu faith seek a personal guru to ensure success in both the material and spiritual realms. Similarly, the Ifa of Africa maintain an elaborate set of puberty rites. Adolescents participate in a symbolic bonding with, and separation from, their parents. This is followed by a test of courage, then instruction by tribal elders and finally an initiation into the ways of securing the aid of various forces of nature.

Hope-related attachments derive from trust and openness. These twin-engines of spiritual growth are intertwined and interdependent. Without openness, trust is stymied. A lack of trust will preclude openness. Gabriel Marcel, the existentialist philosopher, wrote that openness “allows hope to spread,” yielding the “fruits and pledges” of trust and further receptiveness. While humans seem predisposed to be

open and trusting, the quality of care and attention received early in life is a major factor in the continued development of these capacities.

A talent for survival is also present at an early age. One of the first responses that a human infant can make is to express disgust if they are confronted with a sour taste or foul odor. Given something sweet to taste, they will smile. At birth, they are pre-wired with some 70 reflexes, including the rooting response for food as well as the startle and stepping reactions. Within 6 months, the typical infant shows sadness when there is a sense of loss and fear in the presence of danger. As individuals mature they acquire personal coping skills and defenses. Humans, like all social animals, derive further protection from group membership.

Beyond self and society, humanity has sought hope via religious and spiritual beliefs. Reflecting significant motivational diversity, these beliefs and practices offer varying degrees of mastery, attachment or survival-based hope. For example, Hindus derive spiritual empowerment by accessing the “inner Atman.” The Navaho and Lakota are “glued together” by tribal customs and a shared legacy. Buddhists find salvation in the promise of an afterlife devoid of want and suffering.

Level 3: Hope Traits (The “Hopeful Core”)

The “hopeful core” is comprised of three clusters of personality traits. The first cluster is forged from the mastery and attachment elements and consists of the *will to hope*, *goal-related trust*, and *mediated power*. The “will to hope” is more fundamental than either a will to power (Nietzsche) or a will to pleasure (Freud). It encompasses a number of ideas put forth by existentialists and humanists, including Maslow’s notion of peak experiences, Erikson’s prompting that “I am what I will.” It embraces the “growth-centered attitude” discussed by Carl Rogers and Anthony Sutich (1969) as well as Marcel’s emphasis on readiness, openness, and availability. The “will to hope” is also related to Klinger’s (1977) definition of a meaningful life in terms of purposeful engagement with the world.

Goal-related trust is grounded in the self as well as others. In the West there is a greater tendency to trust the self in goal-related matters whereas in the East there is greater reliance on external support. For example, Hindus place enormous trust in gurus. In Sanskrit the word “guru” means both “teacher” and “heavy.” The latter definition captures the “weight” of investment placed by Hindus in their spiritual guides.

Hope derives from a mastery “middle ground,” an experience of shared power and control that emerges from an intimate association with a larger force or presence (spiritual as well as non-spiritual in nature). Stated differently, a hopeful outlook transcends the traditional internal versus external control dichotomy. Hope-based outcomes are mediated through empowering relationships.

The notion of *mediated power* has resided in the psyche for countless millennia. Sophocles wrote, “Heaven helps not the men who will not act.” St Paul likewise declared, “I can do all things through Christ which strengtheneth me.” In the East, the “elegant sayings” of the Tibetan monks have long included the following insight: “Men . . . by depending upon the great, may prosper; a drop of water is a little thing, but when will it dry away if united to a lake?” A Koran prayer implores, “Add to my strength through him and make him share my task.”

William James (1961) discussed the influence of the “the more” in religious experiences, the sense of union with a power that is simultaneously beyond us and at the same time, felt as part of the self. Psychologist Paul Pruyser as well as philosopher William Lynch have effectively argued that this sense of mediated or shared control is what helps to differentiate (a more spiritual) “hope” from (a more ego-centered) “optimism.”

The second cluster of hope traits is derived from the attachment motive. *Relational trust* is based on openness and disclosure as well as intimacy and gratitude. The hopeful individual trusts in the availability of a valued person or transcendent presence. They maintain a posture of openness towards the object of trust, striving for increasingly deeper levels of intimacy. Their reward is a constant ally, their Christian “shepherd,” Hindu “inner god” or Native American “guiding spirit.”

Hope is also sustained by a sense of “continued presence.” In the deepest traces of the mind there are stored mergers of the self with important others. Attachment theorists such as Kohut (1971) have labeled this psychic fusion the “self-object.” By unconsciously joining with a more powerful force the newly formed self is strengthened. In some form, this process continues throughout life.

The third cluster is geared towards survival. These traits include: *survival-oriented trust*, *terror-management capacity*, and a sense of *symbolic immortality*. Together, they provide a way of addressing the great challenges of the human condition: fear, pain, loss, and death.

Survival-oriented trust offers the assurance that an individual’s well-being matters to some other person, group or higher power. There is a firm belief that support will be there when needed, that one will not languish in isolation. This notion is beautifully captured in the famous Irish blessing that begins with the lines, “May the road rise to meet you” and ends with the words, “May God hold you in the palm of his hand.”

A capacity for *terror management* implies that an individual is not paralyzed by fear or anxiety. While fully aware of life’s vicissitudes, the hopeful individual trades in denial and delusion for an enlarged and more eternal perspective. Fear is replaced by a sense of serenity and perhaps even the comfort in “knowing” there is a benign higher power that offers protection. Goethe, the German poet, listed among his “nine prerequisites for a good life,” “hope enough to remove all anxious fears.”

Symbolic immortality is acquired by investing parts of oneself (one’s “hopes”) in more enduring aspects of reality. In fact, Robert Lifton identified as many as five different ways of “transcending death,” including via one’s progeny, creating something of lasting value, bonding with the eternal cycles of nature, seeking salvation in religious or spiritual beliefs, or realizing “moments of immortality” through meditative practices.

Religious and non-religious scholars agree that by focusing on more enduring aspects of the self in relation to the universe, one can achieve a sense of *spiritual integrity*, a feeling of wholeness and continuity that can be retained despite whatever physical and emotional setbacks may be occurring.

Level 4: The Faith System

Faith is a product of trust, mediated power and self-other bonds. When tested, faith discloses whether or not a person has a “will to hope” as well as adequate trust and openness. Faith is a barometer of terror management capacities and reveals the presence or absence of spiritual integrity and symbolic immortality. Faith is the bedrock of trait hope. Kahlil Gibran called it “an oasis in the heart.” Mary McLeod Bethune, a daughter of former slaves who became an educator, political activist and presidential advisor, wrote, “Without it nothing is possible. With it, nothing is impossible.”

More than one source of faith can sustain an individual’s hope. This is a further indication of the interplay of the motive systems that underlie hope. A person can develop faith through mastery and attachment, via attachment and survival, or by embracing all three of these motives. Along the lines of Fowler (1996), these faith sources can be understood as “centers of values.” (As a point of clarification, regardless of which motives underlie an individual’s experience of hope, if these impulses are perceived as “central” to one’s sense of self, the result is a “spiritualized” hope.)

Level 5: Expressions of Hope

Hope is more than a cold expectation. It also involves a commitment to action and an associated deep feeling tone that is characteristic of a “hot cognition.” Shlomo Breznitz (1986) referred to the “work of hope” in managing stressful encounters. Erikson (1950) alluded to its “surface and depth” while Emily Dickinson paid homage to the hopeful “tune without the words.”

Hope-based mastery includes beliefs and feelings related to empowerment as well as the establishment and pursuit of transcendent goals. Hope-based attachments spawn a sense of continued presence as well as acts of interpersonal trust and openness. Hope-based survival is constituted from the belief in a benign universe, a well-regulated physiology, and acts of care recruitment.

In summary, while “optimism” gets most of the attention in the scientific literature as well as the popular press, it is hope that is the subject of enduring myths and legends (Prometheus and Pandora). It is hope that is associated with a patron saint (St Jude), the color of spring and the daffodil. It was hope and not optimism, which created the “Great Gatsby’s” longing for a distant light.

Hope and Quality of Life

The most potent QOL indicators are those which impact the individual’s psychological, social, and physical well-being. For example, an economist might suggest that employment opportunities are a powerful predictor of subjective well-being that can also reduce social tensions while resulting in improved health status. A sociologist may highlight the psychological, social, and physical benefits of stable family units and continued trust in other longstanding institutions. At the psychological or subjective level, hope is a potent QOL variable because of *its* impact on the mental, social, and physical functioning of the individual.

In preparing this chapter, I searched “quality of life” within three different databases, Medline, Psychinfo, and Sociological Abstracts. All together, I found approximately 60,000 publications that included “quality of life” in the “subject” field. However, when I entered “hope and quality of life,” this number was reduced to 679 or approximately one per every 100 publications. Likewise, among the more than 200 presentations at these proceedings, only three dealt with hope. If indeed “hope” is such a powerful “human ally” then why so few references in the QOL literature? I believe that part of the problem is a failure to adequately conceptualize hope as a complex emotion with cognitive, social, and spiritual components. A recent debate within the emerging field of “positive psychology” offers a good illustration.

Snyder (2004) suggested that hope was the most important of the virtues, the wellspring for the development of other positive traits. Seligman (2002), in partial agreement with Snyder, proposed that hope is one of three main components of “authentic happiness.” Moreover, Park *et al.* (2004) tested Snyder’s “hope hypothesis” by correlating 24 character traits with a well-known measure of subjective well-being (SWLS; Diener *et al.*, 1985). Although hope was among the strongest predictors of well-being, it was not appreciably greater than several other virtues.

This particular “slippage” is understandable given Snyder *et al.*’s (1990) goal-oriented approach to hope. Snyder’s approach to hope follows in a long line of “cognitive “expectancy” theories that includes Stotland’s (1969) hope theory, Abramson, *et al.* (1989) reformulation of helplessness attributions, and Scheier and Carver’s (1987) approach to optimism. While “goal expectations” are an important part of the hope construct, as was discussed earlier, they are by no means “the whole story.”

Conceptual clarity with regards to hope is important in its own right. Otherwise the entire enterprise of hope-related research may be skewed. In addition, a broader perspective on hope that includes social and spiritual aspects offers a far richer conceptual interface to bridge with various objective QOL indicators. Indeed it is ironic that Park *et al.* challenge Snyder’s “hope-centered” hypothesis by invoking the virtues of “perseverance” (a mastery variable), “love” (an attachment variable), and “modesty in the wake of trauma” (a survival variable).

What factors should be considered in conceptualizing subjective QOL? Diener and his colleagues have focused on “life satisfaction.” Park *et al.* mentioned “pleasure,” “engagement,” and “meaning.” Ryff (1995) offered a six-fold model of psychological well-being that includes autonomy, environmental mastery, positive relations with others, purpose in life, self-acceptance and personal growth. There are two notable trends in psychological studies of QOL; a movement towards multidimensional models, and a consideration of transcendent aspects such as “engagement,” “purpose” and “spiritual well-being.”

The Case for Hope

My argument for hope as the primary focus in subjective QOL is based on six observations. *First*, an integrative approach to hope that encompasses mastery, attachment, and survival, subsumes many of the “well-being” variables promoted by other theorists (e.g., perseverance, engagement, purpose, love and positive relations, etc.).

Second, “hope” incorporates many of the “virtues” highlighted within the emerging field of “Positive Psychology,” including courage and perseverance (mastery) as well as love, relatedness (attachment), and adaptive self-regulation (survival and terror management).

Third, concerns about attachment, mastery, and survival are already a major focus of QOL investigators. Within these proceedings one can find explorations of “trust,” “social anomie,” and “political cynicism.” There are studies pertaining to “work ethic,” the “American dream,” and “empowerment.” Survival issues surface in explorations of “health care quality,” “migrant adaptation,” and “vulnerability.” Similarly, the last several volumes of *Social Indicators Research* have included articles on “intimacy” and “loneliness,” “self-esteem” and “productive activities,” “resiliency” and “security.”

Fourth, as I noted earlier, hope is typically a spiritual experience. One cannot offer a complete analysis of “quality of life” without factoring in religious and spiritual beliefs. Stretching back to the dawn of civilization, such beliefs have provided a majority of the world’s population with its greatest sense of “well-being,” in good times and bad.

Fifth, the “spiritual capital” of a nation can be assessed in terms of how much hope it provides to its citizenry. Does a country provide a sense of collective mastery? Does it engender trust and impart a reassuring worldview? If the answer is yes to all three of these questions, we might single out such a country as having a particularly high “national hope index.”

In contrast, consider Africa. No continent is more “hope challenged.” Three hundred million of its inhabitants live in total poverty. More than 33 million are infected with the HIV/AIDS virus. As a result of AIDS, more than 12 million children have been orphaned. Of all the African nations, Liberia may be the one that affords the lowest quality of life. This country of three million people has been ravaged by more than a decade of civil war. Over 50,000 have been killed and countless others have been tortured or maimed. Large sections of the country have been without electricity or running water for decades. One foreign observer called it the “world’s most stark example of a failed state.” On a wall, the misspelled graffiti of a desperate child says it all, “We one peecee” (we want peace).

In Liberia, every vital sign of hope has been undermined. Corruption and infighting among rival warlords have eroded trust in political leaders and their institutions (poor attachment). The educational system is in shambles and only 20% of the population is able to read and write (poor mastery). Firefighters are without trucks and wheel barrels serve as makeshift ambulances (poor survival).

Liberia’s “ray of hope” is soccer sensation George Weah. When Liberia’s national team was nearly disbanded due to a lack of funds, Weah donated his own money to pay the players’ salaries, purchase uniforms and transport them to matches. Nelson Mandela has called him the “African Pride.” A Liberian official puts it even more bluntly, “George Weah and soccer are the only things we can hold onto.”

Sports Illustrated’s S.L. Price (2001) made a “pilgrimage” to Liberia in 2001 to observe the “holy positions” maintained by George Weah and the game of soccer. When interviewed, a teammate suggested that Weah’s emergence “had been designated by God.” Price also noted that whenever Weah attends a youth soccer

clinic or visits a hospital, the locals begin to murmur, “He is coming. Jesus is coming.” On the day Liberia was scheduled to play Sierra Leone, the scene was very much like a religious procession. Throngs of adoring fans formed a caravan around the team bus, cheering and singing to the players. “Church services stopped in mid-sentence. People smiled for the first time in a month . . . A man with no legs tried to crawl after the bus as it passed.” Weah understands the enormous responsibility that has been placed on his shoulders. “Soccer is a game of hope, and in this country . . . there is very little [Hope].”

Sixth, an integrative and spiritualized hope offers a rich interface to explore links between various levels of individual functioning (psychological, social, and physical) and multiple “objective” QOL indicators. “Hope” can be explored as both a causal factor and as an outcome, potentially linked with such factors as “work ethic” and “productivity,” quality of housing and healthcare, as well as the rise or fall of religious, social, or political institutions.

Hope in the Age of Anxiety

To reinforce an earlier point, hope is an especially relevant virtue in this age of anxiety. Because hope is spiritualized and grounded in faith, it can keep an individual as well as a nation “centered” in the worst of times. In elaborating on this point, the biological concept of “allostasis” may serve as a useful analogy. When an organism manages to remain within a biologically desirable range of functioning, it is demonstrating “homeostasis.” If the same organism is subjected to stress, levels of one or more biological parameters (e.g., temperature, fluid levels, or electrolytes) may be dramatically altered. Energy must be expended restore biological harmony. The wear and tear of being cast “adrift” and investing resources to return to a steady state has been termed “allostatic load.”

Hope defines subjective QOL in a turbulent time because it helps to reduce psychological and spiritual “drift,” the emotional equivalent of “allostatic load.” In particular, hope-based attachments, rooted in trust and openness, can provide a counterweight to balance the impulse toward cynicism and isolation that arises during times of international conflict and economic hardship. Hope-based mastery, drawn from an association with larger “centers of value” assures immunity against states of helplessness and despair. Hope-based survival, derived from “soothing introjects” (e.g., of early caregivers or a higher power) as well as various spiritual beliefs can confer what Lifton called a “sense of symbolic immortality,” an important factor in precluding levels of mass terror.

Empirical Studies

A hope test has been derived from the integrative approach outlined in this chapter (Comprehensive Hope Scales; Scioli, 2004). The 16 scales reflect attachment, mastery, and survival concerns as well as underlying facets, including

supported mastery and progress towards ultimate goals (mastery), trust and openness (attachment), and care recruitment and liberation beliefs (survival). Nine of the scales constitute a non-spiritual cluster while the other seven provide a spiritual-hope score. An example of a non-spiritual, mastery item is, "I believe that I am going to get what I really want out of life" An example of a spiritual attachment item is "I have never felt close to any kind of spiritual force or presence (reverse scored)." An example of a spiritual, terror management item is, "In times of terror or uncertainty, I can find tranquility in my spiritual beliefs." Extensive reliability and validity testing, including principal component analysis, have supported the structure and content of the individual clusters and scales.

Four Studies

The comprehensive hope scales have been used in four recent studies that pertain to quality of life and coping in an age of anxiety. Specifically, in collaboration with my colleagues and students, I have explored the relationship between hope and the following: life satisfaction, perceived control and spiritual empowerment, imagined loss, and exposure to mortality salient stimuli.

Hope vs. SES as Predictors of Life Satisfaction

Which is the better predictor of life satisfaction; hope or socioeconomic status? To address this issue, measures of hope and life satisfaction were administered to both young adults (mean age = 19.10) and middle-aged individuals (mean age = 43.40). Life satisfaction was assessed via Diener *et al.*'s (1985) Satisfaction With Life Scale (SWLS). SES was computed using Hollingshead's (1975) formula.

The pattern of correlations was the same across the age groups. For example, SES was *not* a significant predictor of life satisfaction in either sample (young adults: $r = .12, p > .05$; middle-aged sample: $r = -.09, p > .05$). In contrast, trait hope was significantly correlated with life satisfaction (combined samples; $r = .59, p < .05$). Two regression analyses were also conducted. Using a forced entry procedure, it was found that trait hope contributed 97% of the explained variance in life satisfaction, as compared to just 3% for SES (trait hope: $\beta = .61$; SES: $\beta = .06$). When a stepwise regression was used, only trait hope was retained in the equation and SES was excluded.

Perceived Control and Spiritual Empowerment

A sample of young adults received the Rotter (1966) Locus of Control scale along with the trait hope measure described above. The Rotter scale is a classic measure of internal versus external locus of control. Higher scores reflect a greater sense of internalized control. We divided the locus of control scores into low, medium, and high, hypothesizing that the most hopeful individuals, sustained by "felt associations" with perceived others, would fall in the middle of the control spectrum (neither fully "externalized" nor totally "internalized" in terms of perceived control). As expected, the

Table 2. Trait hope and spiritual empowerment.

	Total trait hope (CHS; Scioli, 2004)
<i>Ryan and Fiorito (2003) means-ends scale</i>	
A primary goal for me in being spiritual is To access the divine energy within me	.64**
My spiritual beliefs do not empower me	-.26
By being spiritual I want to feel less alone and helpless in my life tasks	.39*
A goal in being spiritual is to feel more empowered to work and cope	.49**
In being spiritual I want to feel empowered	.46**
By something or someone greater than I	
Total Spiritual Empowerment	.65**

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

medium-internal control group had a significantly higher level of hope-based mastery than either the low-internal group or the high-internal group ($F(40) = 3.68, p < .05$).

Hope scores were also compared with spiritual empowerment items from the Means and Ends Spirituality Questionnaire developed by Ryan and Fiorito (2003). Trait hope was significantly correlated with all but one of the spiritual empowerment items (see Table 2). The correlation between Trait Hope and Total Spiritual Empowerment was quite strong ($r = .65, p < .001$).

Hope and Imagined Loss

A classic picture-story exercise (TAT; Murray, 1971) was used to test the hypothesis that hope can serve as a buffer against imagined losses. Participants were given TAT card 14, depicting an individual in a darkened room staring out of a window. The words below the picture read: "This person has just returned from a funeral. What is happening now? What happened in the past? What will happen next? Who is this person? What are they thinking and feeling? Participants were given 5 minutes to write a story. Recent comments by Watkins (2004) regarding the "life satisfaction" literature provided the impetus for employing an "implicit measure" of responses to imagined loss. Watkins expressed concern about the over-reliance on self-report measures and called for more complementary indices of well-being.

Two blind raters coded the number of positive and negative emotion terms in the stories as well as the number of positive references to the deceased (inter-rater reliability was high: $r = .90$). Higher trait hope scores were positively correlated with a greater number of positive emotions ($r = .35, p < .05$). There was little relationship between trait hope and number of negative emotions ($r = -.09, p > .05$). There was a trend, suggesting greater trait hope was linked to more positive references to the deceased ($r = .33, p = .06$).

Hope, Death Depression and Death Anxiety

In addition to imagined losses, “turbulent times” tend to evoke mortality concerns and increased death anxiety (Becker, 1973). Two studies were conducted to test the hypothesis that hope can serve as a buffer against death-related depression and death anxiety. In study one, Templer, *et al.*'s (1990) Death Depression Scale was given to individuals along with the hope scales. Although the overall Trait Hope score was not significantly correlated with death depression ($r = -.23, p > .05$), there were significant associations involving the survival hope cluster ($r = -.42, p < .05$) as well as two of the individual survival scales (Personal Terror Management, $r = -.40, p < .05$ and Spiritual Terror Management, $r = -.49, p < .05$). As expected, the strongest predictor of (less) death-related depression was a spiritual variable.

In study two, we tested the hypothesis that hope and spirituality would serve as stronger buffers against death anxiety as compared to “self-esteem.” The latter construct has been the focus of the “terror management group” (Greenberg, *et al.*, 1986) that has sought empirical support for Becker's (1973) speculations on the role of self-related constructs in mitigating death anxiety concerns.

Seventy-six young adults were shown a ten-minute edited segment from the film “Philadelphia” starring Tom Hanks. The film is about a successful young lawyer who contracts AIDS. He deteriorates over the course of the film and ultimately dies. Prior to viewing the film, participants were given the hope scale, a standard measure of self-esteem, and Piedmont's Spiritual Transcendence Scale (Piedmont, 1999). Before and after the film, participants received equivalent halves of the Death Anxiety Scale (Templer, 1970). The dependent variable was a difference score, computed by subtracting the pre-film death anxiety value from the post-film death anxiety value. Nearly half of the participants demonstrated an increase in death anxiety. The self-esteem measure did not emerge as a significant predictor. However, higher scores on both the spiritual hope cluster and the “universality” sub-scale of the Spiritual Transcendence Scale were associated with either a reduction or no change in death anxiety.

Summary and Concluding Observations

In this chapter I have argued that hope and spirituality should play a central role in quality of life studies. In particular, an integrative approach to hope that encompasses attachment, mastery, and survival as well as spirituality offers a powerful means of indexing subjective well-being at both the individual and group level. Six observations and four empirical studies were presented in support of this thesis.

In the course of these proceedings several presenters broached the issue of how to incorporate spirituality into the study of QOL. Spiritual beliefs are equally, if not more complex, than hope. Moreover, spiritual beliefs vary enormously across cultures and sometimes even within subcultures. Addressing this diversity may both enrich and complicate the study of QOL. For example, Scioli and Biller (2003) have suggested that at least seven different kinds of hope are offered by the world's major religious and spiritual traditions. For example, Buddhism's confers a

Table 3. Hope profiles of major religious and spiritual belief systems (from Scioli and Biller, 2003).

1. <i>Attachment based</i>
Australian (Aboriginal)
2. <i>Salvation based</i>
Buddhist
3. <i>Mastery & attachment based</i>
Hindu
4. <i>Attachment & survival based</i>
Religious sub-variety (human bonds)
Judaic
Spiritual sub-variety (nature bonds)
Ifa (Western Africa)
Spiritual/religious sub-variety (human & nature bonds)
Native American
5. <i>Attachment & survival based (with limited mastery emphasis)</i>
Islamic
6. <i>Attachment & survival based (with moderate mastery emphasis)</i>
Christian (Catholic & Orthodox)
7. <i>Mastery-based (with moderate attachment & survival emphasis)</i>
Protestant

“survival-based hope” whereas Judaism or Islam renders an “attachment and survival oriented hope” Hinduism reflects a hope rooted in “mastery and attachment” (see Table 3). Given this diversity, how should investigators index and monitor the spiritual side of QOL across different cultures?

Sociologists often distinguish between cultural analyses that are absolutist (an “etic approach”) and those that are relativistic (an “emic” approach). Adopting an “etic approach,” investigators and policy-makers might be prompted to gauge the subjective “well-being” of a nation in terms of a “balanced” hope-profile, one that places equal weight on all three of the motives underlying hope (attachment, mastery, and survival). In contrast, an “emic approach” might lead both scientists and public officials to evaluate “well-being” in terms of how well the “hope profile” of that particular nation is being maintained.

While challenging, the inclusion of hope and spirituality as indicators of subjective well-being is vital to the advancement of QOL in this turbulent, “post-traumatic age.” To cite just one obvious example, cults and terrorists groups thrive in a climate of hopelessness because they offer empowerment to the disenfranchised, a sense of inclusion to the alienated, and liberation to the oppressed. From this perspective, ensuring “quality of life” by fostering hope may be more important than ever.

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Part III

Advancing Quality of Life for Selected Population Groups

Communitarian versus Individualistic Arrangements in the Family: What and Whose Income Matters for Happiness?

MARIANO ROJAS

“In the case of the labour market the distribution of resources is based on competition and individual performance. The welfare states’ redistribution is focused at solidarity between citizens. In the case of the family the principle is reciprocity and an informal contract between family members concerning responsibilities for the welfare of family members. There is a contract between spouses, between parents and their children, between adults and their elderly parents, and between adults and further relatives.” Vogel (2003: p. 393)

1. Introduction

The relationship between income and happiness has been widely studied. Most cross section studies find out that a statistically significant but weak relationship between income and happiness does exist. Different variables are used as proxies for income in these studies, being the availability of information a binding constraint. Most studies work with household income, but the use of personal income and adjusted household income is also common in the literature. A recent study (Hsieh, 2004) compares how different income variables—household income, per-capita income, and equivalent income—affect financial satisfaction in older adults in the United States. Hsieh finds out that equivalent and per-capita income are better income predictors of financial satisfaction than family income.

This paper uses information about household income, personal income, personal expenditure, and adjusted household income to study what income proxy better relates to a person’s happiness. Household income refers to the aggregate income earned by all persons who live in the same household as the person whose happiness is being studied. Personal income refers to the income earned only by the person under study. Personal expenditure refers to total spending in personal goods made by the person under study. Adjusted household income is calculated on the basis of household per capita income—household income divided by the total number of household members—and equivalent income—a concept that takes into account the existence of economies of scale as the number of household members increases.

There are substantial differences with respects to Hsieh's paper. First, the investigation deals with happiness rather than with financial satisfaction; it is widely accepted that happiness is a better approximation to a person's well-being than financial satisfaction. Second, it incorporates other proxies for income, such as personal income and personal expenditure. Third, it is not limited to elder people. Fourth, the study is made in Mexico, a country with different cultural and family patterns than the United States. Fifth, it also studies the importance that a person's breadwinning status has in the relationship between income and happiness. Thus, this paper deals with what and whose income matters for happiness.

Furthermore, the paper explores the important implications that the use of alternative income proxies have with respects to our conception about living arrangements within the family.¹ For example, the use of household income assumes that a person's happiness is related to the purchasing power of her family, and that this person's happiness is independent of her breadwinning and family status. In other words, it is assumed that household income is a common pot from which every member of the family can equally benefit. Thus, if household income is relevant in explaining a person's happiness then it is possible to state that there are communitarian arrangements within the family.

On the other hand, the use of personal income to explain a person's happiness assumes that what matters is the income that this person generates, and that this person's happiness does not depend on the conditions of her family nor on her status within the family. If this were the case, it could be stated that living arrangements within this person's family are basically individualistic.

In consequence, the study of what and whose income matters for happiness provides useful insights to a vast literature on family living arrangements. The traditional view approaches the family as a communitarian group; where income, time, and other resources are pooled together, and all family members equally benefit from the household's resources.² The intra-family allocation of the scarce resources is not dominated by self-centred considerations. No family member takes advantage of his or her status to attain greater happiness by influencing the intra-family allocation of resources. Therefore, household income -rather than personal income- better explains a person's happiness in a communitarian family. In addition, her happiness and her benefits from household income are not related to her specific breadwinning status within the family.

In his pioneer work on the economic approach to the study of the family, Becker (1973, 1974, 1981) assumes that some family members—usually the head of the family—behave altruistically; while the other members of the family behave selfishly. Thus, Becker combines communitarian and individualistic characteristics within the family. Becker assumes that altruistic members are concerned about the well-being of the rest of the family—although not necessarily as much as they are concerned about their own well-being—and, in consequence, the well-being of other members is incorporated in the utility function of altruistic members. Selfish members are just concerned with their own situation, and they have no interest in the well-being of the rest of the family. Therefore, personal income should be a relevant explanatory variable for happiness in the case of non-altruistic family members; while household income should be a more relevant explanatory variable for the altruistic members.

The recent literature approaches the family as a cooperative arrangement, where family members—in special, spouses—have selfish behaviour (they are concerned just about their own utility) and act unilaterally. A cooperative equilibrium (a marriage or a family) emerges because it is in the interest of every member. This approach has been called *Cooperative Bargaining Models of Family* (Manser and Brown, 1980; McElroy, 1985, 1990; Lundberg and Pollak, 1993 and 1996; Pollak, 1994, 2002), and it explains intra-family decisions as the result of a collective-choice process; which takes place on the basis of selfish and unilateral behaviours that leads to cooperative household equilibriums. Hence, family members remain in the household as long as the arrangement is in their advantage. This approach implies that personal income—and personal expenditure—should be better explanatory variables of a person's happiness rather than her household income.

In consequence, the study of what income variable better relates to a person's happiness has important implications for the validity of different approaches to the study of the family.

It is important to state that the vast literature on family arrangements emphasizes the consumption side of living arrangements, and sometimes other areas such as women incorporation into the labour force (Edmonds *et al.*, 2004). There are not previous studies that emphasize the happiness side of family living arrangements; which is an important issue because happiness is an ultimate goal, while consumption is just an instrumental goal.

Furthermore, those studies that emphasize the consumption side of living arrangements usually conclude that household income—as an indicator of a person's access to economic resources—tends to exhaust as the number of members in the household increase. Therefore, household per-capita income and household equivalent income—which adjust household income by the family's size and its age structure—are used on the basis that they better relate to the well-being of household members. Happiness can be used as a proxy for well-being in order to test what income variable better relates to well-being and, in consequence, to study the degree of depletion of material resources as family size and age structure change.

In addition, even if families have communitarian arrangements, it could still be possible to have some asymmetry in a member's access to the common pot (household income) For example; Lundberg *et al.* (1997) find out that an increase in a person's income raises her decision-making power within the family. This investigation tests whether an asymmetric arrangement exist on the basis of a person's bread-winning status. The family would become a perfect communitarian group if bread-winning status does not make a difference in the relevance of household income as an explanatory variable for happiness.

Thus, this paper constitutes a first attempt to get inside the black box of the household's income-happiness relationship. The paper is structured as follows. Section 2 discusses the database and the variables used in the empirical analysis. Section 3 studies the relationship between income and happiness. Section 4 deals with what income variable is more relevant in explaining a person's happiness; it also discusses the degree of communitarian arrangements within the family, as well as whether there is a depletion of household income in the generation of happiness as the size of the family increases. Section 5 studies whether a member's breadwinning

status within the family has an impact on her access to the family's material resources for her happiness pursue. Section 6 presents some general conclusions from the investigation.

2. The Database and List of Variables

A survey was conducted in five states of central and south Mexico³ as well as in the Federal District (Mexico City) during October and November of 2001. A stratified-random survey was designed to gather the information. The survey was balanced by household income, gender, and urban-rural areas. The sample size is acceptable for inference in central Mexico; 1540 questionnaires were properly completed.

The survey gathered information regarding the following quantitative and qualitative variables:

Demographic variables. Education, gender, age, civil status, family size, age structure, number of household-income dependants, and breadwinning status.

Socio-economic variables. Twenty-four questions were asked to gather information about housing conditions, ownership of durable goods, and access to public services. Three variables that describe the socio-economic position of a person were constructed on the basis of principal-components technique: Soc_1 relates to ownership of commodities such as computer, microwave ovens, and cable/satellite TV, as well as house size (measured by number of bedrooms and number of lights). Soc_2 relates to access to public services such as running water, sewage, and electricity. Soc_3 relates to variables that describe the situation in the neighbourhood, such as quality of public transport, streets, public lighting, and security.

Economic variables. Current household income, personal income, and personal expenditure in thousands of Mexican pesos.

Happiness. A seven-option scale was used. A question of the form "Taking everything in your life into consideration, how happy are you?" was asked. The following are the scale's answering options: *extremely happy*, *very happy*, *happy*, *somehow happy*, *neither happy nor unhappy*, *unhappy*, and *very unhappy*. Happiness is handled in a 1 to 7 scale; where 1 was assigned to the lowest level of happiness and 7 to the highest. It is treated as a cardinal variable.⁴

3. On the Relationship between Happiness and Income

First of all, it is important to state that income, independently of how it is measured, is not a crucial variable in the explanation of happiness. Numerous investigations have dealt with the relationship between economic variables and happiness (Douthitt *et al.*, 1992; Diener *et al.*, 1993; Diener, 2002; Diener and Oishi, 2000;

Table 1. Happiness and income* simple regression—two specifications for income.

	Linear specification		Log-income specification	
	Coefficient	Prob > <i>t</i>	Coefficient	Prob > <i>t</i>
Intercept	5.3	.000	5.0	.000
Income	.0125	.000	.212	.000
R-squared		.020		.045

Note: * Household income is used as a proxy for income in these regressions.

Diener and Suh, 1997; Frey and Stutzer, 2000; Fuentes and Rojas, 2001; Easterlin, 1974, 1995, 2001) The finding of a weak or non-existent relationship between income and happiness in cross-section studies is common in this literature.

Thus, income is not a very important resource in the generation of happiness. However, its relevance is larger at low income levels; thus, a logarithmic measure of income provides better goodness of fit than a linear approximation. Two simple regressions are run in order to explore this issue. Table 1 shows the results from the analysis.

Table 1 shows that: First, the logarithm of income provides a better goodness of fit than the absolute income value. In consequence, the impact of income on happiness declines as income increases. Second, the relationship between income and happiness is weak; income alone—in its logarithm specification—explains less the 5% of the variability in happiness. Third, the relationship between income and happiness is positive and statistically significant; however, an increase of about 500% in income is required to increase happiness in just one category (in a 1–7 scale)

Thus, even though income is not a crucial variable in the explanation of happiness, it still has a positive and statistically significant relationship with happiness. Hence it is of interest to study what proxy for income performs better.

4. What Income Matters?

4.1. Proxies for Income

Income is a general concept associated to a person's command over resources that are useful to purchase goods and services. It is possible to conceive different proxies for this concept. Each proxy implies important conceptual assumptions and has different empirical consequences. Five different proxies for income—all measured in monthly terms—are considered in this investigation:

- Household income (Y_H): refers to the aggregate income earned by all persons living in the same household.⁵
- Personal income (Y_{pers}): refers to the income earned exclusively by the person under consideration.
- Personal expenditure (Y_{exp}): refers to the expenditure made by the person in goods and services for his or her exclusive consumption.

- d. Household per-capita income (Y_{H-pc}): refers to the ratio of household income over the total number of members in the household. It is a measure of average income within the household.
- e. Household equivalent income (Y_{H-eq}): This concept is based on two main assumptions: First, that there are scale economies as the number of household members increases. In other words, adding a second or a third adult to the household does not represent as much a burden as the first member. Up to a certain degree, many household items can be shared, with no exclusion and little rivalry among family members. Second, children and adolescents do not represent as much a burden as adults. Thus, different weights are assumed for the first adult and for the rest of adults in the house, as well as for children and adolescents. This investigation uses the weight criteria followed by the Organisation for Economic Cooperation and Development (OECD), where the first adult is set at 1.0, other adults at 0.7, and children and adolescents at 0.5.⁶

Table 2 presents the correlation matrix for the five income proxies used in this investigation. It is observed that the correlation coefficient is very high for the household per-capita and equivalent incomes. Correlations are relatively low for the personal income and the household per-capita and equivalent incomes. Household income is correlated with all other proxies, but correlation coefficients are not extremely high.

4.2. *Is the Family a Communitarian Group?*

It is possible to study the degree of communitarian arrangements within the family on the basis of the relationship between happiness and the different proxies for income. The aggregate income of her group should be the relevant explanatory variable for a person's happiness if the group is communitarian; while her personal income should be the relevant explanatory variable if the group is individualistic. Thus, in a perfectly communitarian family, a member's happiness is associated to her household's income, but not to her personal income. In other words, in a communitarian family a member's happiness better relates to household income, rather than to personal income. On the contrary, in an individualistic family, a member's happiness does not relate to her household's income, but only to her personal income.

Therefore, the issue demands for a comparison of the impact of household income (Y_H) and personal income (Y_{pers})—or personal expenditure (Y_{exp})—on a person's happiness. It is clear that a communitarian living arrangement should not be

Table 2. Correlation matrix alternative income proxies.

	Y_H	Y_{exp}	Y_{pers}	Y_{H-pc}	Y_{H-eq}
Y_H	1.000	.671	.578	.752	.731
Y_{exp}	.671	1.000	.564	.684	.664
Y_{pers}	.578	.564	1.000	.355	.399
Y_{H-pc}	.752	.684	.355	1.000	.992
Y_{H-eq}	.731	.664	.399	.992	1.000

associated to an equal distribution of material resources (household income) among all family members, since not all family members require the same resources for their happiness. Family members may require different material goods and services because of different life purposes, life situations, and personalities. Thus, what really matters for the family being a communitarian institution is that its members are not restricted by their personal income nor by their family status in their happiness pursue.

The following regression was run to study whether the Mexican families can be considered as communitarian:

$$H = \alpha_0 + \alpha_1 \ln Y + \delta X_{\text{control}} + \mu \tag{1}$$

where:

H refers to happiness

Y refers to a proxy for income

X_{control} is a vector of the following control variables (δ is a vector of parameters)

Gender: 1 for male, 0 for female

Education: level of education

Age: age in years

Civil status: vector of dichotomous variables, *single* is the category of reference

Socioeconomic variables: *Soc*₁, *Soc*₂, *Soc*₃, explained in section 2.

Three proxies for income were used: household income (Y_H)—which is relevant in communitarian family arrangements, personal income (Y_{pers}), and personal expenditure (Y_{exp})—which are relevant in individualistic family arrangements. Table 3 presents the estimated coefficients for each income proxy.

Results from the exercise show that the relevant variable for explaining a person’s happiness is not her personal income nor her personal expenditure, but her household income. Controlling for other socio-economic and demographic variables, an increase of a 100% in a person’s household income tends to increase her happiness in one tenth of a category. As it is expected with income, the impact on happiness is relatively small, but it is statistically significant. On the other hand, the impact of a person’s personal income and personal expenditure on happiness is

Table 3. Happiness and income relationship different proxies for income.

	Proxy for income		
	Household income (Y_H)	Personal income (Y_{pers})	Personal expenditure (Y_{exp})
Ln. Income Coefficient (α_1)	.099	.005	.005
Prob. > <i>t</i>	.001	.554	.844
R-squared	.094	.093	.084

Specification for each regression:

$$H = \alpha_0 + \alpha_1 \ln Y + \delta X_{\text{control}} + \mu$$

Control variables: age, gender, education level, civil status, and socio-economic indices. The estimated δ coefficients are not shown in the table.

negligible and statistically non different than zero. Thus, the happiness benefits from household income are shared by all household members and, in consequence, Mexican families follow communitarian arrangements.

In addition, the non relevance of personal income indicates that there is substantial altruism within the family; income earners do not obtain any extra-happiness benefit. All income goes to a common pot, and no family member is excluded from the happiness benefits of household income on the basis of his or her lack of contribution.⁷

4.3. *Is there a Depletion of Household Income?*

From a happiness perspective, household income is a common pot from which all family members can benefit if there is a communitarian arrangement in the family. However, a communitarian family may still face the problem of depletion of resources. The material resources that a household income provides have to be shared by a larger number of members as family size increases. Hence, for a given household income, it could be more difficult for a family member to obtain the same happiness in larger than in smaller families. In other words, there could be family-size depletion effects on the household's common pot. The existence of a depletion effect can be explored with the use of family-size adjusted incomes. This investigation uses two adjusted measures, the household per-capita income (Y_{H-pc}), which takes into consideration the number of household members; and the household equivalent income (Y_{H-eq}), which encompasses the existence of scale economies in family size and also adjusts for the family's age structure.

Regression (1) was run to test for the existence of depletion effects in the impact of household income on a person's happiness as her household size increases. Three proxies for income were used: Household income (Y_H), household per-capita income (Y_{H-pc}), and household equivalent income (Y_{H-eq}). Table 4 shows the results from the analysis.

It is clear that a person's happiness is related to her household income; the coefficient is statistically different than zero when household income is considered. On the other hand, a person's happiness is not related—in a statistically

Table 4. Happiness and income relationship different proxies for income.

	Proxy for income		
	Household income (Y_H)	Household per- capita income (Y_{H-pc})	Household equivalent income (Y_{H-eq})
Income coefficient (α_1)	.099	.035	.028
Prob. > t	.001	.189	.311
R-squared	.094	.090	.090

Specification for each regression:

$$H = \alpha_0 + \alpha_1 \ln Y + \delta X_{\text{control}} + \mu$$

Control variables: age, gender, education level, civil status, and socio-economic indices. The estimated δ coefficients are not shown in the table.

sense—to adjusted income measures such as household per-capita and equivalent incomes. Thus, a person's happiness is related to her household income, and this is independent of the number of family members and of their age structure. This result indicates that from a happiness perspective there are no significant depletion effects associated to a larger family size nor to a change in its age structure.⁸

There are two potential explanations to this interesting finding. First, there could be substantial family-size scale economies at the household level, and this economies are not fully captured by adjusted income measures such as the household per-capita and equivalent incomes. It seems that in the generation of happiness there is little intra-family rivalry in the use of a household's material resources.⁹ Second, happiness is not only related to a person's access to material resources (consumption), but also to a person's access to affective intra-family resources. A larger family may imply less access to material resources, but it may also imply more access to affective intra-family resources. The affective effects may compensate—and could even overcome—the material effects of larger families; thus, a person's happiness is not smaller—and could even be greater—in a larger family, even if household income remains constant.¹⁰

In conclusion, because of communitarian arrangements in the Mexican family, household income is the best income proxy in the study of a person's happiness in Mexico. The remaining sections of the paper will use household income as the income proxy.

5. Whose Income Matters?

In a communitarian family it should not matter who the source of income is or how much a person contributes to the total household income. In other words, a person's happiness should not depend on his or her breadwinning status or on his or her share of the household income. Being the main breadwinner, a secondary breadwinner, a marginal breadwinner, or even no breadwinner at all should not matter for the access to the family resources that contribute to happiness. Likewise, earning a large share of the household's income or no share at all should not matter. On the contrary, in an individualistic family the access to resources that contribute to happiness is expected to be strongly related to a person's share in the generation of his/her household's income; as well as on his/her breadwinning status.

5.1. *Happiness and Breadwinning Status*

The survey gathered information about a person's breadwinning status. Four categories were created: main breadwinner, secondary breadwinner, marginal breadwinner, no breadwinner. This is a self-reported categorical variable; which provides information about the status of the person with respects to his/her role in the generation of household income. Table 5 provides information about the breadwinning status distribution, as well as about average happiness by status.

Table 5. Breadwinning status frequency and corresponding average happiness.

Breadwinning status	Percentage in sample	Average happiness
Main breadwinner	46.4	5.36
Secondary breadwinner	23.0	5.46
Marginal breadwinner	18.0	5.46
No breadwinner	12.6	5.33

It is observed in Table 5 that there is little difference in average happiness across breadwinning status.

The following regression was run to study whether a person's breadwinning status makes a difference in his or her happiness, as well as on his or her capacity to obtain happiness from variations in her or his household income.

$$H = \beta_0 + \beta_1 S_B + \beta_2 M_B + \beta_3 N_B + \beta_4 \ln Y_H + \beta_5 S_B \ln Y_H + \beta_6 M_B \ln Y_H + \beta_7 N_B \ln Y_H + \phi X_{\text{control}} + \mu \quad (2)$$

where:

H refers to happiness

$\ln Y_H$ refers to the logarithm of household income

S_B is a dichotomous variable, with a value of 1 if the person is a secondary breadwinner, and a value of 0 otherwise.

M_B is a dichotomous variable, with a value of 1 if the person is a marginal breadwinner, and a value of 0 otherwise.

N_B is a dichotomous variable, with a value of 1 if the person is not a breadwinner, and a value of 0 otherwise.

X_{control} is a vector of the following control variables (ϕ is a vector of parameters)

Gender: 1 for male, 0 for female

Education: level of education

Age: age in years

Civil status: vector of dichotomous variables, *single* is the category of reference

Socio-economic variables: Soc_1 , Soc_2 , Soc_3 , explained in section 2.

The category of reference in regression (2) is a person who is the main breadwinner in the family. Thus, parameters β_1 , β_2 , and β_3 must be interpreted as the happiness difference between the secondary, marginal, and no breadwinner position and the main breadwinner, respectively. These parameters are useful to test whether there exists a happiness difference across persons which is explained only by their breadwinning status. Parameter β_4 shows the relationship between household income and happiness for the main breadwinner; while parameters β_5 , β_6 , and β_7 indicate whether there is a difference in the happiness—household income relationship between the main breadwinner and the secondary, marginal and no breadwinner persons, respectively.

In a communitarian family, a person's breadwinning status should not influence his or her access to the family's material resources. Thus, as household income increases, the increase in happiness should be similar to any member in the family, independently of his or her breadwinning status. In consequence, if the family is a communitarian organization then parameters β_5 , β_6 , and β_7 should be no different than zero. Furthermore, a person's breadwinning status should not influence his or her access to all family's resources. Thus, parameters β_1 , β_2 , and β_3 should also be no different than zero.

Table 6 presents the results from regression (2). First, it is observed that a person's breadwinning status does not make a difference with respects to his or her happiness. There are not statistically significant differences between the happiness of a main breadwinner and the happiness of a secondary, marginal or no breadwinner person. However, it seems that marginal breadwinners have greater happiness than secondary breadwinners.

In addition, the impact of income on happiness is small but statistically different than zero. For a main breadwinner, as household income increases in 100%, his or her happiness increases in almost a tenth of a category. It is observed that the impact of household income on happiness is not statistically different when a secondary, marginal or no breadwinner person is considered. Thus, as household income increases, the happiness of any family member increases in a similar way, independently of his or her breadwinning status. This finding is consistent with a communitarian family.

5.2. Share in Household Income

Section 5.1 worked with a self-reported breadwinning status to explore whether there is a difference in the relationship between happiness and household income on the basis of a person's breadwinner status within the family. The same issue can

Table 6. Happiness and income breadwinning status.

Variable	Coefficient	Prob > t
Secondary breadwinner (<i>SB</i>)	-.500	.41
Marginal breadwinner (<i>MB</i>)	.466	.42
No breadwinner (<i>NB</i>)	.083	.91
$\ln Y_H$.096	.02
$\ln Y_H * SB$.060	.38
$\ln Y_H * MB$	-.044	.52
$\ln Y_H * NB$	-.023	.79

Regression is based on equation (2).

Control variables: age, gender, education level, civil status, and socio-economic indices. The estimated ϕ coefficients are not shown in the table.

R-squared: 0.098.

be addressed on the basis of a person's share in his or her household income. Let's define a person's share as the ratio of his or her personal income over his or her household income:

$$S_{\text{per/H}} = \frac{Y_{\text{per}}}{Y_{\text{H}}}$$

Table 7 provides some basic statistics for $S_{\text{per/H}}$. It is observed that the mean value for the share of a person's income in his or her household income is 0.56. Twenty percent of people in the survey do have a share of 0, meaning that they make no contribution to their household's income. On the other hand, 35% of people in the survey have a share of 1, which means that they earn the totality of their household's income.

If breadwinning status matters, then a person's happiness should rise as his or her share of personal income in household income increases.

The following regression was run to study whether a person's happiness is related to his or her share in the generation of household income:

$$H = \varphi_0 + \varphi_1 \ln Y_{\text{H}} + \varphi_2 S_{\text{per/H}} + \omega X_{\text{control}} + \mu \quad (3)$$

All variables in regression (3) have already been defined. Table 8 shows the relevant estimated parameters.

It is observed that a person's happiness slightly declines as his or her share in the generation of household income increases; however, this decline is not statistically different from zero. Thus, from a statistical point of view, a person's share in

Table 7. Descriptive statistics share of personal income in household income.

Range	Percentage
$S_{\text{per/H}} = 0$	20.5
$0.50 \geq S_{\text{per/H}} > 0$	25.8
$1.0 > S_{\text{per/H}} > 0.50$	19.3
$S_{\text{per/H}} = 1.0$	34.4
Mean value	0.56

Table 8. Happiness and income personal share in household income.

Variable	Coefficient	Prob > t
$\ln Y_{\text{H}}$.085	.01
$S_{\text{per/H}}$	-.056	.41

Regression is based on equation (3).

Control variables: age, gender, education level, civil status, and socio-economic indices. The estimated ω coefficients are not shown in the table.

R-squared: 0.095.

the generation of household income does not make a difference in his or her happiness. This result strengthens the general argument that from a happiness perspective Mexican families are basically communitarian.

6. Conclusions

This investigation has used self-reported happiness, as well as the emerging literature on subjective well-being and economics, to test some hypothesis about family arrangements. In addition, it provides useful conclusions about what income variable is more relevant to the study of a person's happiness.

The literature on living arrangements within the family has usually focused on consumption as a proxy for a person's well-being. However, consumption is not a good proxy for well-being because there is much more in life than the standard of life. Hence, family arrangements should be judged on the basis of a good proxy for well-being; this investigation has used a person's self-reported happiness.

It was found that neither personal income nor personal expenditure are the relevant variables in explaining a person's happiness, but his or her household income. This result indicates that Mexican families are organised on the basis of a communitarian arrangement, rather than an individualistic or bargaining arrangement. In addition, it was shown that a person's relationship between household income and happiness is not affected by the size of her family or by its age structure. Thus, no depletion effects associated to larger family sizes and compositions are found in Mexican families. This finding may occur because of substantial scale and scope economies in the use of material resources at the family level; another possible explanation is based on the existence of positive affective effects as the family size increases.

Furthermore, the study found that a person's increase in happiness as household income rises is independent of his or her breadwinning status. This finding is consistent with the existence of communitarian arrangements within the family.

Thus, with respects to the Mexican data, it seems that household income is the best income proxy to study a person's happiness. However, this result should not be extended to other regions, since it is contingent of the country's culture and family arrangements. More cross-country comparative research is needed. Future research would also benefit from the use of panel—rather than cross-section—data; as well as from databases that use the family—all members—as subjects of study.

Notes

1. Strauss and Thomas (1995) discuss whether the household extends beyond a residential unit or whether it is limited to those persons that occupy the same physical residence. This investigation uses a same-residence occupancy definition, and it uses the terms household and family as synonymous.
2. The family is seen as an institution that provides a large vector of services to its members; for example: coping with risk, providing unemployment insurance, taking advantage of

- specialization and division of labour, pooling resources and taking advantage of scale and scope economies, modifying labour supply, and so on (Benjamin, 1992; Rosenzweig, 1988; Strauss and Thomas, 1995; Thomas, 1990; Vogel, 2003).
3. The states included in the survey are: Oaxaca, Veracruz, Puebla, Tlaxcala and the State of Mexico. The survey was applied in both rural and urban areas.
 4. Ferrer-i-Carbonell and Frijters (2004) have shown that there are not significant differences in the results when happiness is treated as a cardinal rather than as an ordinal variable.
 5. In this research, all household occupants are considered as family members. Cultural patterns in Mexico justify the use of an extended definition for the family; which goes beyond the typical nucleus of father, mother, and children. Grandparents, uncles, aunts, nephews, nieces, cousins, and so on, may also be considered as members of the family as long as they live under the same roof. Thus, the investigation works with an extended conception of the family.
 6. Notice that the relevance of the equivalence scale used by the OECD can be tested on the basis of the relevance of household equivalent income as an explanatory variable of happiness
 7. It is important to keep in mind that the survey was not applied to kids nor teenagers; thus, the analysis only takes into consideration the reported happiness of adults living in the house.
 8. This result is consistent with the findings of van Praag and Ferrer-i-Carbonell (2004, chapter 15) On the basis of a Belgian database, they find out that there are substantial scale economies.
 9. Household income can be used to provide public goods and services at the intra-family level. In other words, most of the goods and services provided by household income show non-rivalry and non-exclusion intra-family attributes.
 10. It is also important to remember that up to a certain degree the original size of the family is an endogenous variable for some family members (parents); and its composition is also an endogenous variable for most adult members.

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Socioeconomic Inequality and Inequalities in Health Among Kibbutz Elderly¹

URIEL LEVIATAN AND CHAGIT SALM

Introduction: Kibbutz Background for the Study

In the past the aging population of the kibbutzim demonstrated a high level of health, exceptional levels of wellbeing, longevity, and solid testimony to successful aging. These were evinced in many indicators. For instance, death rates of members aged over 50 years were much lower than those for the Jewish population in Israel, to the ratio of 1:2 or 2:3. Life expectancy of the kibbutz population was thus three to four years longer than that of the Jewish population in Israel. It was also longer than in other populations in industrial societies (Leviatan *et al.*, 1983; Leviatan, 1999; Leviatan and Cohen, 1985). Illustrative data are shown in Table 1.

Moreover, the aging population of the kibbutzim enjoyed also very positive levels of physical health and wellbeing in comparison with other populations. These were expressed in indices such as satisfaction with specific life domains, with kibbutz life, and with life in general (Leviatan *et al.*, 1981; Carmel *et al.*, 1995; 1996; Leviatan, 1999; Tannebaum *et al.*, 1974). The aging kibbutz population thus demonstrated “successful aging,” as the concept is suggested in recent writings (e.g., Rowe and Kahn, 1998; Baltes and Baltes, 1990; Leviatan, 1999).

Research on aging in kibbutzim focused on the following question: “What are the main determinants of the positive indices of health, wellbeing, and life expectancy for the kibbutz population in general, and for its elderly in particular?” Major findings of such research pointed to the *social arrangements* that kibbutzim offered to their members as the pivotal factor explaining the positive outcomes summarized above. Underlying these arrangements were the following principles: (1) reference to each individual according to his/her unique needs and capabilities (as demanded by the guiding kibbutz principle of “qualitative equality”: “To each according to his/her needs, from each according to his/her capabilities”); (2) total and unconditional responsibility of kibbutz communities for satisfying the needs of members and those dependent upon them and for taking care of their personal development; (3) expression of full solidarity among members; (4) striving for “qualitative equality” among members in all domains of life.

Table 1. Life expectancy (LE) at birth and at age 50 of Kibbutz Permanent Population and Israeli Jews in Three Years—1977, 1984, and 1995 (by gender).^a

Gender	Year	LE at birth		LE at age 50	
		Kibbutz	Israeli Jews	Kibbutz	Israeli Jews
Males	1977	74.4	71.9	28.3	25.7
	1984	76.7	73.5	29.6	26.5
	1995	78.1	75.9	30.8	28.3
Females	1977	79.0	75.4	31.0	28.0
	1984	81.3	77.1	33.4	29.2
	1995	82.5	79.8	33.8	31.2

Sources: ^a Leviatan (2003); data for the Jewish population in Israel are taken from *Statistical Abstracts of Israel*, Central Bureau of Statistics (1979, 1986, 1997).

Social arrangements based on these principles were adjusted to create ‘social capital’ (Leviatan *et al.*, 1981; Leviatan, 1992; Cohen-Mansfield and Leviatan, 1992; Leviatan, 1999) as a resource conducive to the enhancement of health and well-being of kibbutz members.

The physical aspect of “social capital” (Lynch and Kaplan, 1997) was expressed, for example, in the kibbutz commitment to create appropriate jobs for the elderly at every age and as long as they were willing to continue working. Jobs were created that took into account the particular limitations of the elderly members, and their work arrangements were adapted to their changing capabilities as regards, for instance, the reduction in number of working hours per day, per week, and per year. Resources were invested in the creation of appropriate possibilities for leisure activities; the material standard of living of the aged was kept equal to that of younger members in their full capacity as workers; and their special needs concerning money were shouldered by their kibbutz (e.g., special budgets to allow for gifts and visits of grandchildren from outside the kibbutz.) Kibbutz health institutions saw themselves as responsible for the elders’ health, and therefore institutionalized preventive medicine, ambulatory institutions, and medical follow-ups— all under institutional responsibility.

Parallel to investments in the creation of the physical form of “social capital” came the building of “social capital” in the social spheres (Kawachi, 1999). For the elderly members this was expressed in an emphasis on social integration, and the offer of social support. Expressions of generating this form of “social capital” are exemplified in the intensive integration of the aged members in the civic life of their kibbutzim; in their continued right to hold office in all governing bodies of their kibbutzim; in an effort to involve them in the community’s cultural and social life. Other ways of expressing the focus on building “social capital” were the integration of the elderly in the organic work teams of their work places, and the establishment of unique social institutions on the kibbutz (such as “committees for veteran

members”) whose unique goal was to take care of the needs and problems of the aged members.

The thesis arguing for the importance of social arrangements found support in research. For instance, older members of kibbutzim that differed in levels of supportive social arrangements, assumed to contribute to health and wellbeing, indeed displayed expected differences on these outcomes (Leviatan *et al.*, 1981; Leviatan, 1999). The findings were similar when kibbutzim were compared with other populations in Israel and abroad (e.g., Leviatan, 1988) and again when personal characteristics and social arrangements were contrasted for their relative strength as predictors of wellbeing and health of members (Leviatan *et al.*, 1981).

Yet, the importance of socioeconomic equality among members of different communities could not be tested directly, as kibbutzim showed hardly any variability in this regard.

This deficiency of past studies can now be remedied by the research opportunities offered in light of the structural transformations currently experienced by many kibbutzim.

Current Structural Changes in Kibbutzim

During the last fifteen years, kibbutzim have experienced what often is labeled as the “kibbutz crisis” (e.g., Rozolio, 1999; Rosner and Getz, 1996; Leviatan *et al.*, 1998). Since the end of the 1980s, and still more intensively from the 1990s to the time of writing (2005), many kibbutzim have experienced major structural and ideological transformations (see annual surveys by Getz, 1990–2004). These structural changes significantly influence social arrangements that kibbutzim follow and these, in turn, exert major effects on health and the wellbeing of all members, the elderly in particular.

The most significant structural changes are firstly expressed in “privatization of public budgets,” and secondly in “differential salaries” (in which remunerations are based on level of professional or managerial positions at work).

“Privatization of public budgets” means that a public budget, such as the budget of food, which previously was distributed according to individual needs (within the capabilities of the kibbutz) has been “privatized.” Now each member receives a food budget which is equal to what other members get, without reference to any unique needs or wishes of the individual concerned. Many kibbutzim have similarly “privatized” public budgets for other consumption domains (such as vacations, home maintenance, extracurricular education for children and adults, health treatments not covered by the national insurance, higher education, and more).

The principle of privatization of public budgets eliminates the view of each individual as unique and abolishes the principle of “qualitative equality.” With this, the responsibility of kibbutz institutions to treat each individual member “according to his or her needs” is lifted also and so is the fate of unconditional solidarity among members. Thus, the distributive principle preserved in privatization might be labeled as “mechanical equality.”

The second major topic of structural changes adopted presently by about half of all kibbutzim is expressed in the differential levels of salaries members now get

Table 2. Percentage of kibbutzim reporting adoption of structural privatization or differential salary (1990–2003).^a

DOMAIN // YEAR (19.. or 20..)	'90	'91	'92	'93	'94	'95	'96	'97	'98	'99	'00	'01	'02	'03
* Privatization of food budget	3	NA	6	7	16	25	38	48	60	64	69	72	80	85
* Privatization of enrichment studies for children	4	5	9	10	12	14	13	19	26	28	32	41	45	50
* Privatization of higher studies (part or whole)	1	3	3	4	7	7	10	8	11	15	21	28	48	53
* Privatization of health budget (part or whole)	NA	NA	NA	NA	NA	NA	NA	6	9	9	21	32	49	57
* Differential salary (part or whole)	NA	NA	NA	NA	1	2	6	10	16	12	31	43	50	57

^a Source: Getz (1998–2004) Annual surveys.

from their kibbutz. A salary based on level of position at work. The distributive principle operating here is the “equity” principle of remuneration. It runs counter to the principles previously exercised by the same kibbutzim, when personal or family consumption budgets were calculated to assure a similar standard of living for all members (“mechanical equality”) yet it also took into account the family’s or the individual’s unique needs (“qualitative equality”).

The adoption of differential salaries usually follows major privatizations. It takes one more step farther away from the past definition of equality in kibbutz society. Even the “mechanical” principle of equality is given up and the ruling principle becomes “equity” (Homans, 1961; Adams, 1965).

Table 2 shows the percentages—at different years—of kibbutzim that have privatized various domains and those adopting differential salaries for remuneration.

Socioeconomic Inequality and Its Effects on Health

The structural changes in kibbutzim described above—“privatization of public budgets” and “differential salaries”—are expected to be of major importance in influencing the physical and mental health of members. This is because they bring about *inequality in socioeconomic positions within the same communities*.

A rich literature shows that individuals lower on socioeconomic status dimensions suffer more from ill health symptoms or from risk factors for health (e.g., Adler *et al.*, 1994; Adler and Ostrove, 1999; Marmot, 1999; Robert and House, 2000; Anderson and Armstead, 1995; Taylor *et al.*, 1997; Robert, 1998; Taylor *et al.*, 1997).

Other research, at the aggregate level of analysis, posits a negative relationship of degree of socioeconomic inequality with average levels of health and life expectancy of members in these social aggregates (Wilkinson, 1999; Lynch and Kaplan, 1997; Kawachi *et al.*, 1999). This is because communities with more expressed socioeconomic inequalities invest *less* in physical expressions of “social capital,” and their psycho-social kind of “social capital” is also at a lower level.

These findings from studies outside the kibbutz are relevant to the kibbutz situation and their structural transformations. Consider the following:

1. The privatization of public budgets and the introduction of differential salaries increases inequalities in social status through creating a sizeable layer of “poor” (rank-and-file level) members on the one hand, and “rich” (high ranking managerial office holders) members on the other (Rosner *et al.*, 2002; Pavin, 2003). Health of the rank-and-file members is expected to be at lower levels than that of the office holders.

Such a relationship was already found in past research on kibbutz members (e.g., Tannenbaum *et al.*, 1974; Leviatan, 1980, 1991; Bartolke *et al.*, 1985), but then it was relatively weak for two reasons: (1) inequality in social positions was not accompanied by inequality in economic remuneration because salaries (or personal consumption budgets) were not correlated with work positions; (2) the principle of managerial rotation (Leviatan, 1978) did not allow a person to hold a senior hierarchical position for a long time.

These two conditions no longer exist in “differential” kibbutzim: economic inequalities are inherent in them by the very definition of the new structure of

remuneration; and the principle of managerial rotation has been abolished by about two fifths of these kibbutzim (Getz, 2004). Office holders in the “differential” kibbutzim apparently guard their position so as not to lose the ample rewards that go with the office. A dynamics that follows the “iron law of oligarchy” suggested by Michels (1959), and akin to the situation observed in other cooperatives by Meister (1974) and in labor unions by Lipset (1954).

2. At the community level of analysis, privatization of public budgets and differential salaries should lower members’ health levels due to the smaller investment made by these communities in physical determinants of health as found elsewhere by Lynch and Kaplan (1997). It also should bring about less positive expressions of psycho-social capital as suggested by research in other populations (e.g., Kawachi, 1999; Marmot, 1999). One should expect in these communities the lowering in levels of mutual trust, in norms of reciprocity, in social support, in social involvement, in social integration, in social and civic activity, in quality of working life, and in degree of influence members have in their community.

Figures 1 and 2 summarize the discussion thus far by displaying two causal flow models: (1) at the societal (aggregated) level of analysis; and, (2) at the individual level of analysis.

Hypotheses

Given the relationships suggested in Figures 1 and 2, we now state formal hypotheses to be investigated in this study.

1. Hypotheses at the aggregate level of analyses:

Ha1: Kibbutzim that practice arrangements of differential remuneration and extensive privatization will show lower levels of the existence of “social capital.”

Ha2: Members of kibbutzim that practice differential remuneration and extensive privatization will express, on average, lower levels of health and wellbeing, and higher levels of ill health.

2. Hypotheses at the individual level of analysis:

Hb1: An individual’s hierarchical position on socioeconomic dimensions will determine that individual’s level of health.

Hb2: Individuals’ experience and/or perception of existent “social capital” in their community will determine their level of health.

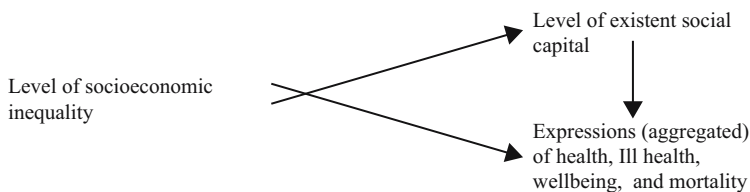


Fig. 1. A causal flow model at the social (aggregate) level of analysis.^a

^a Relating to each other level of socioeconomic inequality, existence of social capital (physical and social,) and aggregated expressions of health, ill health, wellbeing, and mortality.

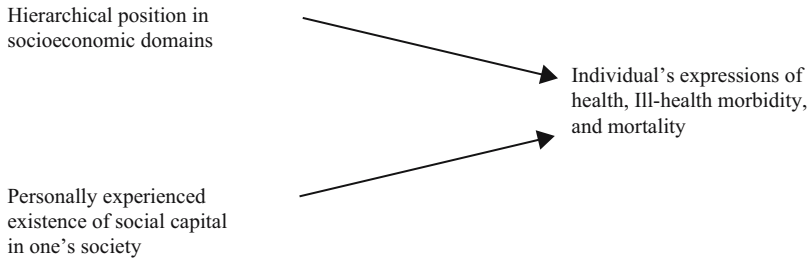


Fig. 2. A causal flow model at the individual level of analysis.^a

^a Relating to each other hierarchical position in socioeconomic domains, experienced existence of social capital in one's society, and expressions of health, ill health, morbidity, and mortality.

Research Methods

Study Design

This is a cross-sectional study; data were collected in 2002 from samples of older members (55+ years) in four kibbutzim. The sample formed two matched pairs; kibbutzim in each pair were roughly equal in their level of economic situation, time of settlement, and their membership ranged at around 300–400. In each pair one kibbutz had instituted differential salaries as its remuneration system (the D kibbutz) and one still operated the traditional (qualitative equality) system of remuneration (the T kibbutz). The founders of all four kibbutzim were of (Jewish) eastern European origin, and all four belonged to the former Kibbutz Artzi federation.

Sample

The original sample consisted of about 280 members aged 55+ years from the four kibbutzim described above. Excluded from the samples of each kibbutz were individuals recognized as cognitively weak or physically sick, those who could not respond to questionnaires, or were residents of homes for the aged and frail. We chose to concentrate on older respondents because we expected them more likely to respond with health symptoms to stresses in their environment.

Due to the relatively small number of actual respondents in each of the four kibbutzim (only about 35) we combined data for each of the two types (D or T) of kibbutzim and compared the two types with each other. That way, we in fact compared exposure of individuals to the experience of their type of kibbutz—Differential or Traditional.

Instruments

The major instruments were the following: (1) A questionnaire elicited perceptions and evaluations of various domains in kibbutz life, self-evaluation of health and

wellbeing, and personal demographic-biographic details. (2) The medical files of the same individuals were analyzed by a health professional of the kibbutz (nurse or the local family physician); these professionals also gave a general evaluation of each respondent's level of health. (3) Key central office holders were interviewed by phone as informants on the level of privatization and on details of the structure of differential remuneration in their kibbutz.

Questionnaire items were mostly set on Likert-type scales, each with a range of five possible responses, generally from "most positive" (1) to "least positive" or "most negative" (5).

Variables

Factor analyses (extraction method: Principal Component Analysis; Varimax Rotation) of the data produced, where appropriate, indices. Individuals' scores on each index are the means across the items included in it. Table 3 displays all variables and some of their statistical characteristics.

Plan for Testing Hypotheses

Analyses at the aggregated level: Because we had only two groups of individuals, we could not test for the intervening position of "social capital" between level of socioeconomic inequality (operationally defined as a kibbutz being Differential or Traditional). We therefore tested for a direct relationship of type of kibbutz (D or T) with indices depicting experience and/or perceived levels of social capital on the one hand, and with indicators of health and wellbeing on the other.

Analyses at the individual level: We tested relationships of (1) experienced and/or perceived levels of existing "social capital" with indicators of health and wellbeing; and (2) individual standing on social status dimensions with indicators of health and of wellbeing.

Findings

The two traditional kibbutzim still adhered to the principle of equality so that personal budgets were allocated to individuals and families equally or according to needs (as determined by size of family or by special needs); the two kibbutzim with differential salary arrangements had an allocation structure whereby remuneration was according to position at work. The range of salaries was 1:2.3 for one kibbutz, and 1:3.4 for the other kibbutz.

The two differential kibbutzim had privatized the following public budgets for consumer items: food, higher education, personal enrichment courses, laundry, health, and children's education. Only the food budget had been privatized in the two traditional kibbutzim. Both the differential kibbutzim had become such only within two years prior to data collection, but discussion among members and the psychological stress and conflicts that accompanied the fierce debates were present at least one or two years before that.

Table 3. Variables used in the study and their descriptive characteristics.

Variable or Index	Details	N	Mean	SD	Cronbach's alpha
(1) Being a member of a differential / traditional kibbutz. <i>Indicators of social capital</i>	Percent traditional	141	50%		
(2) "Satisfaction with the state of equality on kibbutz" (1 item).	at work; in the dining hall; at cultural activities; at activities of social committees.	127	3.55	.96	
(3) "Frequency of institutionalized opportunities offered by/in the kibbutz to meet other members whose company I desire"—(4 items).		135	3.16	1.11	.695
(4) "Satisfaction with social relations in the kibbutz"—(3 items).	Satisfaction with . . . : the existing social relations one has with other members; interpersonal relations on one's own kibbutz; intergenerational relations on one's own kibbutz. Agrees with these statements: Members are mutually considerate toward each other in day-to-day life; I am sure that in time of need members will support me economically and socially.	139	2.83	.83	.832
(5) "Solidarity and mutual consideration among members"—(2 items).	Does not agree with these statements: Conflicts exist among many members; Conflicts exist between members and office holders on the kibbutz.	138	2.74	.91	.592
(6) "Conflicts among kibbutz members"—(2 items).	a global index resulting from a secondary factor analysis on indices 2–6 above.	138	3.01	.84	.601
(7) "Social Capital"—(5 items). For sake of parsimony, this index was used for testing hypotheses and not its components.	In social leadership; in business leadership.	141	2.94	.71	.750
(8) "Extent of trust one has in kibbutz leadership"—(2 items).		136	3.47	1.02	.788

continued

Table 3. (continued) Variables used in the study and their descriptive characteristics.

Variable or Index	Details	N	Mean	SD	Cronbach's alpha
(9) "Frequency of visits one gets at own home during an average week"—(4 items).	From kibbutz office holders; from friends; from family members; from acquaintances.	131	3.56	.97	.649
(10) "Frequency of opportunities in informal or leisure activities to meet other members whose company I desire"—(4 items).	As guests in my apartment; in my neighborhood; in my children's apartment; in my leisurely activities.	137	3.05	.87	.675
(11) "Attendance of public functions"—3 items	A mean across three items yes (1)/no (2): "Eating in the common dining hall"—"Participation in community cultural activities"; "Participation in social committees."	135	1.19	.32	.719
<i>Health and wellbeing</i>					
(12) "Medical treatments"—(2 items).	Number of visits to family doctor last 12 months; number of prescriptions written for person in last 12 months.	141	5.10	5.80	.932
(13) "Evaluation of respondent's health by clinic personnel (physician or nurse) of kibbutz"	Health state on basis of medical file; health relative to respondent's age group.	141	2.71	1.19	.893
(14) "Number of symptoms" (out of 24) respondent "always" suffers from	As analyzed by nurse or family physician from medical records.	142	1.44	1.73	
(15) "Number of symptoms" (out of 24) respondent "always" suffers from (same symptoms as analyzed from medical records.)	Self-reported in questionnaire.	142	3.20	2.14	
(16) "Self-reported health"—(4 items).	Satisfaction with own state of health; self-evaluation of own health; as compared to own health a year ago; as compared to health of age group.	140	2.70	.82	.898

Variable or Index	Details	N	Mean	SD	Cronbach's alpha
(17) "Physical health"—(5 items). For sake of parsimony, this index was used in analyses for testing hypotheses and not its components.	A global Index resulting from secondary factor analysis. It is composed as a mean across indices 12–16 above.	142	2.77	1.57	.639
(18) "Alienation" (reversed)—(2 + 2 items).	Feeling of powerlessness (2 items); feeling of normlessness (2 items) (Seeman, 1959) (1—highly alienated; 5—not alienated).	137	2.90	.89	.658
(19) "Satisfaction (in general) with life on kibbutz" (1 item). <i>Demography and biography</i>	Age	137	2.49	.84	
(20) Demographic characteristics.	Number of children	136	68.9	10.2	
	Gender (57.4% females); Family status (71.7% with partner); Adult children on same kibbutz (63%).	125	3.42	1.07	
(21) Positions on status dimensions	Level of formal education 51.4%—above high school—51.4%. Managerial office currently held—13.9%; Highest managerial office held within last five years: 6.5% = managerial office or committee chair; 31.7% = committee member; 61.8% = none.				
(22) Material standard of living (2 items). (Satisfaction with standard of living is assumed to reflect, at least partially, differentials in economic status.)	Satisfaction with . . . personal material standard of living; standard of living compared to other members in own kibbutz.	139	2.67	.81	.808

Table 4. Comparison of respondents of two kibbutz types (D and T^a): their state, perceptions, and attitudes as regards “Social Capital,” health, and wellbeing. age group 55–70; mean age about 62.

Variables and indices	Kibbutz type	N	Mean	SD	Student's t
<i>Indicators of social capital</i>					
* Satisfaction. with equality on kibbutz (1—highest)	D	29	3.93	1.10	2.29*
	T	46	3.43	0.78	
* Trust in leadership (1—highest)	D	35	3.93	0.94	2.18*
	T	45	3.48	0.90	
* Social capital (1—highest)	D	35	3.45	0.68	5.26***
	T	48	2.72	0.59	
* Members' visits to one's home (1—highest)	D	33	3.40	1.21	NS
	T	43	3.65	0.87	
* Meetings (informally) with members (1—highest)	D	35	3.33	0.91	NS
	T	46	3.03	0.72	
* Attending kibbutz functions (1 = all; 2 = none)	D	34	1.40	0.41	4.79***
	T	45	1.05	0.12	
<i>Indicators of health and wellbeing</i>					
* Physical health (1—highest)	D	35	2.40	1.11	NS
	T	48	2.04	0.98	
* Alienation (reversed) (1—lowest)	D	34	2.98	0.95	NS
	T	46	2.96	0.93	
* Satisfaction with kibb. Life (1—highest)	D	35	2.83	1.01	2.22*
	T	48	2.40	0.644	
* Age	D	35	62.6	5.38	NS
	T	48	61.3	4.16	

^a D = kibbutz with differential remuneration; T = traditional kibbutz.

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

Comparisons of Respondents of the Two Types of Kibbutzim

Members from the D kibbutzim were on average older than those from the T kibbutzim. To overcome this problem we performed two analyses of comparisons: once with a group aged 70 years or younger (Table 4) and then with a group aged 71 years or older (Table 5).

At age 70 or younger, the two sub-samples differed in expected ways. Differences appeared in how they experienced the existence of “social capital” on their kibbutz, satisfaction with the level of equality among members, level of trust in local leadership, attendance at local social functions, and level of satisfaction with kibbutz life. In all comparisons the members from traditional kibbutzim exhibited more positive results. Yet, no statistically significant differences appeared in the index of satisfaction with personal material standard of living, neither did any of the demographic or biographic variables show statistically significant differences. This was the case for the variables of level of education

Table 5. Comparison of respondents of two kibbutz types (D and T^a): their state, perceptions and attitudes as regards “social capital,” health, and wellbeing. age group 71 or older; mean age about 80.

Variables and indices	Kibbutz type	N	Mean	SD	Student's t
<i>Indicators of social capital</i>					
* Satisfaction. with equality on kibbutz (1—highest)	D	33	3.88	.74	4.68***
	T	17	2.76	.90	
* Trust in leadership (1—highest)	D	33	3.51	1.01	3.68***
	T	17	2.47	.82	
* Social capital (1—highest)	D	33	3.18	.56	6.54***
	T	19	2.21	.43	
* Members' visits in one's home (1—highest)	D	32	3.66	.89	NS
	T	17	3.48	.81	
* Meetings (informally) with members (1—highest)	D	32	3.04	.81	2.14*
	T	18	2.46	.99	
* Attending kibbutz functions (1 = all; 2 = none)	D	30	1.28	.36	3.29**
	T	18	1.05	.14	
<i>Indicators of health and wellbeing</i>					
* Physical health (1—highest)	D	34	4.30	1.11	3.64***
	T	19	2.82	.97	
* Alienation (reversed) (1—lowest)	D	32	3.42	.81	NS
	T	19	3.28	.69	
* Satisfaction with kibb. Life (1—highest)	D	32	2.47	.88	NS
	T	19	2.21	.79	
* Age	D	34	79.9	4.93	NS
	T	19	80.32	6.84	

^a D = kibbutz with differential remuneration; T = traditional kibbutz.

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

attained, percentage of those holding office currently or in the past five years (though the trend in the data was in the expected direction,) gender composition, family status, and total number of children, and those on the kibbutz. The age in the two groups was equated: 62.6 vs. 61.3. As well, no statistically significant difference emerged in the global measure of physical health, although it was in the expected direction.

Table 5 shows the same analysis as Table 4, but with the group aged 71 years or older.

At the age of 71 or older, the two sub-samples differed in a similar way as the younger age group, but the differences were more pronounced and the levels of *Student's t* statistics were higher. The effect of kibbutz type on the global health measure of physical health was particularly pronounced. Here, again, none of the demographic or biographic variables showed statistically significant difference.

Table 6. Relating “social capital” and social status to levels of physical health, alienation, and satisfaction with kibbutz life. Coefficients of correlations are at the zero order level and partial correlations where “age” is held constant.

	Physical health		Alienation		Satis. with life on kibbutz	
	Zero order r	Partial r ^a	r	Partial r	R	Partial r
<i>Indicators of social capital</i>						
* Satisfaction with equality	.280***	.438***	-.273**	-.291***	.302***	.295***
* Social capital	NS	.263***	-.222**	-.255**	.485***	.474**
* Trust in leadership	NS	.239*	-.185*	-.276**	.456***	.438***
* Members' visits to one's home	NS	NS	NS	NS	NS	NS
* Meetings (informally) with members	NS	NS	NS	NS	.266**	.248**
* Attending public functions	NS	.192*	NS	NS	.198*	.193*
<i>Indicators of standings on socioeconomic status dimensions</i>						
* Level of attained education	-.204*	NS	-.310***	-.274**	NS	NS
* Current office holding	.203*	NS	-.254**	-.216*	NS	NS
* Managerial office in previous 5 yrs.	NS	NS	-.299***	-.275**	NS	NS
* Satis. with material standard of living	NS	NS	NS	NS	.433***	.419***
* Age	.496***	—	-.171*	—	NS	—

^a Age held constant.

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

Analyses at the Individual Level

Hypotheses 2a and b concerned how experience of existence (or non-existence) of “social capital” in its various forms affected health and wellbeing, and how health and wellbeing were affected by positions a person held on dimensions of socioeconomic status. These hypotheses were tested at the individual level of analysis first by calculating the zero order coefficients of correlations of variables denoting (1) “social capital”; and, (2) personal positions with physical health, alienation, and satisfaction with kibbutz life. However, since we suspected the age variable to exert strong effect on the outcome variables of health and wellbeing, partial correlation coefficients (holding age as constant) were calculated in parallel. Table 6 presents the two parallel analyses.

It is clear from Table 6 that level of experienced “social capital” was a major contributor to health and wellbeing. Most of the relationships in Table 6 remained substantial when age was held constant and some of them became even stronger.

Satisfaction with kibbutz life was strongly related to satisfaction with level of equality in the community; with level of existent institutional “social capital”; with level of trust in community leadership, with frequency of informal meetings with other members at one’s home; and with attendance at public social functions on one’s kibbutz. It was also related to an indicator of an economic standing of individuals: level of satisfaction with one’s material standard of living. Similarly, most of these relationships remained substantial when age was held constant in an analysis of partial correlations.

Alienation was also related to the experienced levels of the community’s “social capital” (level of equality, institutional “social capital,” and trust in leadership): the higher the level of “social capital,” the lower the expressed feeling of alienation. It was also related to three of the four indicators of social status (education level, holding office currently and in previous five years: the higher the individual’s social status,) the less alienated he/she was. The same was true with age: older individuals were somewhat more alienated. However, all the above relationships remained at roughly the same level when age was held constant.

Table 7. Multiple regression analyses to explain variance in health and wellbeing as outcome variables. Predictors are variables denoting social capital, age, and socioeconomic positions.

Predictors	Beta	Zero order r	Beta *r	Explained variance ^a	r partial
<i>A: Physical health is the dependent variable</i>					
* Age	.570	.505	.288	74.8%	.577
* Satisfaction with equality	.254	.274	.070	18.2%	.296
* Trust in leadership	.200	.140	.028	7.3%	.231
R = .621; R ² = .385; R ² _{adj.} = .370; N = 119; F = 24.25; p < .000					
<i>B: Alienation is the dependent variable</i>					
* Satisfaction with equality	-.274	-.299	.082	39.8%	.292
* Level of attained education	.195	.284	.055	26.7%	.198
* Managerial office in previous 5 yrs.	-.218	-.316	.069	33.5%	.221
R = .454; R ² = .206; R ² _{adj.} = .184; N = 110; F = 9.26; p < .000					
<i>C: Satisfaction with kibbutz life is the dependent variable</i>					
* Social capital	.283	.482	.136	37.7%	.280
* Satis. with standard of living	.288	.420	.127	35.2%	.326
Trust in leadership	.227	.456	.104	28.8%	.228
R = .601; R ² = .361; R ² _{adj.} = .346; N = 131; F = 24.08; p < .000					

^a Since in standard scores $R^2 = \beta_1^2 r_1^2 + \beta_2^2 r_2^2 + \dots + \beta_n^2 r_n^2$, $\beta_n^2 r_n^2 / R^2 * 100$ gives an estimate (in percentage) of the contribution of predictor n to the explained variance in the dependent variables. This is true as long as the major β_n s and r_n s carry the same sign. When this condition does not hold, and the β and r that are involved are large, the formula is difficult to interpret in this way.

Physical health was first of all affected by age: as was to be expected, older members showed lower levels of positive indicators of health and stronger indicators of ill health. However, when age was held constant the three major measures of "social capital" (satisfaction with equality, existence of institutional social capital, and level of trust in community leadership) showed even stronger relationships with physical health.

Next we present multiple regression analyses where the three outcome variables (physical health, alienation, and satisfaction with kibbutz life) were the dependent variables and variables denoting "social capital," social status, and age were the "predictors." Table 7 summarizes these analyses.

The list of "predictors" originally included in the analyses encompassed all indicators of "social capital" in their various manifestations, measures of socioeconomic standings of individuals (education, office holding, and satisfaction with standard of living) membership in a kibbutz type (D or T) and age. Of these, only three variables were included in the resultant multiple regression functions.

The multiple regression analyses (Table 7) show that membership in a kibbutz type (D or T) did not enter any of the formulas. They indicate that the explained variance (of the outcome indicators) carried by this variable was wholly mediated by the "social capital" variables. We tested whether such membership played the part of a conditioning variable by running the same regression analyses separate for the respondents of the D and the T kibbutzim. The resultant formulas came out very similar to the original formulas computed with all respondents.

The data also showed that while age was a major determinant of physical health (as could be expected) it still left a substantial role for indicators of "social capital" (trust in leadership and satisfaction with equality on one's kibbutz) which accounted for about ten percent of the variance in physical health or about 25% of the explained variance. About 37% of the variance was explained by these predictors.

Discussion and Conclusions

The simple conclusion from the findings seem to strongly support this study's general hypotheses: when a kibbutz adheres to a remuneration structure of qualitative equality, and major budgets of consumption are public (rather than privatized), its level of perceived "social capital" is more positive in comparison to the level of perceived "social capital" existent in kibbutzim where salary is differentiated and the public budgets are privatized. The findings also point to a strong positive relationship between perceived level of existent "social capital" and various indicators of personal health and wellbeing. As a less central finding, supported is the hypothesis of positive relationship of personal status positions with indicators of health and well being. Thus, the causal flow of variables seems to be as hypothesized: socioeconomic inequality brings about deterioration in levels of "social capital" and this, in turn, contributes to ill health and lower levels of wellbeing.

These findings could not be attributed to any of the demographic or biographic variables (save age) as the respondents in the two types of kibbutzim did not differ on demography or biography. Age, however, did differentiate between the

two groups—respondents of the “differential” kibbutzim were older, and age was related to ill health and to less positive expressions of wellbeing. Yet, in Tables 4 and 5, where we equated the ages of the two groups, the hypothesized differences between the D and T respondents showed themselves and with a stronger manifestation for the older group (age 71 or older). Also, Tables 6 and 7 supported the expected contribution of “social capital” to the explained variance in variables of health and of wellbeing, beyond the contribution of age.

It seems, therefore, that the main hypotheses of this study were supported by the findings. Yet, before assuming these ready conclusions of the results, we need to explore some alternative interpretations and resolve for methodological threats to the validity (both external and internal) of our findings.

Alternative Interpretations and Threats to Validity

1. Is it possible that the causal flow is in an opposite direction: deteriorating levels of “social capital” (such as trust in leadership, solidarity, or level of social involvement) ignite a wish to give up on partnership and equality and both lead to deterioration in level of health and well being? Testing this counter hypothesis calls for a study with a longitudinal design. Such a design was employed by Leviatan (2001) with several dozens of kibbutzim and across a time frame of ten years. The findings of that study clearly supported the thesis of the current one: kibbutzim first privatized public budgets, than adopted differential salaries and only than experienced deterioration in levels of “social capital.”
2. It is also possible that both the adoption of structural transformations and loss in level of “social capital” are determined by a third structural factor such as size of community, its level of wealth, its number of years in existence, its political and ideological movement affiliation. All these factors could be of importance. However, remember that the four kibbutzim in the study were chosen so as to be equated on all these variables: same movements, about same size, similar level of wealth, and similar number of years since settlement.
3. Selection of kibbutzim into the sample offers another threat to the (external) validity of the findings in our study. Of course, we could not assign kibbutzim randomly to the “differential or traditional treatments.” Yet, we employed a second best design by matching pairs of similar kibbutzim on all important control variables. Thus ensuring the constancy of those variables in the comparisons.
4. Another possible explanation for the findings rests with the fact that the very act of structural transformation of the kind described here (rather than its content) brings with it stresses and strains that are later translated into ill health and deteriorated wellbeing. The reasoning could go further and suggest that several years hence; respondents would adapt to the new situation and come back to their original levels of health reactions. To test for this hypothesis we needed to sample kibbutzim that were at different number of years since adoption of differential salaries. We would expect than improved health among members in kibbutzim with more years into the new structures. Such a study design could not be performed since at the time of the study onset, too few kibbutzim were

already with a differential remuneration system for several years (see Table 2). The test of this alternative explanation will need to await another stage of our research program.

5. Another possible interpretation of the findings that could not be tested is relating the lower levels of health, wellbeing and “social capital” in the differential kibbutzim not to their deeper socioeconomic inequalities but rather to their members’ deep feeling of frustration resulting from giving up on their original ideology of equality and partnership. Such an interpretation assumes, in fact, that the cause of deterioration in health and wellbeing is a widening gap between personal expectation (ideal of equality) and reality. But then, is it not another expression of “relative deprivation” as suggested by Adler *et al.* (1999)? Anyway, in this study we could not compare members (of the “differential” kibbutzim) with varying levels of ideological conviction as we had no measures for level of ideological conviction prior to the onset of the structural transformations.
6. The study suffers from a relatively small number of respondents. Only about 50% of those sampled actually agreed to participate in the study. We suspected this to result from individuals not willing to permit access to their medical records. However, is it possible that this unwillingness differentiated between members of the two types of kibbutzim and thus might have led to a bias in the data? Checks we performed on how representative (age and gender) is the actual sample of respondents of the age and gender distribution among members of their own kibbutz (55 years or older) did not show any difference between the two types of kibbutzim.

While we grant that all these points are of relevancy, none seems to us to be more persuasive than the original interpretation. That interpretation was based on our central hypotheses and grounded in theory and previous research both in kibbutzim and elsewhere.

Limitations of the Study

The Study has several limitations that force some reservations about the conclusions we offered and the interpretations we suggested. One major limitation is the small number of kibbutzim and the fact that the two “differential” kibbutzim did not differ as regards number of years operating under that structural arrangement. Having only two kibbutzim in each group, did not allow testing, at the aggregate level, for the relationship of socioeconomic inequality with level of “social capital.” Another limitation is the relatively small number of respondents (only about 140) which prevented us from performing more detailed multilevel and multivariate analyses. Another major limitation is not having measures in our study to test for the effects of being a T or D kibbutz on the expressions of physical examples of “social capital” and the effect of physical expressions of “social capital” on health and well being. Of course, other limitations are the lack of variables to test for the alternative interpretations (4 and 5 in the previous section).

Being aware of these limitations we, in fact, are pursuing the same research topic in another planned study where they are taken into consideration.

In Conclusion

Differential kibbutzim clearly showed lower expressions of “social capital” in all their manifestations: less satisfaction with equality, less trust in leadership, and less existence of social capital as expressed in intensity and frequency of interaction with other members. It is also clear that members of traditional kibbutzim displayed more positive indicators of health and wellbeing.

Strong relationships, supporting the hypothesis tested, also appeared at the individual level of analysis: members who experienced higher levels of social capital were also healthier and expressed more positive states of wellbeing.

“Social capital” expressed in more private conditions (e.g., leisure activities, visits to one’s home) was not as differentiated between the two types of kibbutzim. We suggest that this reflects a stronger personal component that takes longer to overcome by situational and social transformations.

All these findings render strong support for previous research that viewed social arrangements and the existence of social capital as the major causes of successful aging and longevity of kibbutz members. Accordingly, major changes in social arrangements (e.g., privatization and differential salaries) should adversely affect successful aging, morbidity and mortality, and the wellbeing of kibbutz members. It is perhaps too early for an unconditional conclusion in this direction; more time should be allowed to pass after the adoption of these structural transformations before an unequivocal conclusion could be reached.

Note

1. This paper is based in part on a Master Thesis by the second author written under the guidance of the first author.

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Life Satisfaction Crossover Among Couples

MELVIN PRINCE, CHRIS MANOLIS AND RANDI MINETOR

Introduction

There is little research available on the *ways* relations between marital partners affect each other's well-being and quality of life. What is known, however, suggests that happiness or unhappiness is contagious among couples. For example, happy people have traits, such as compassion and trustworthiness that promote happiness in others (Veenhoven, 1988). Unhappy people have traits such as egocentricity and disagreeableness that lead to unhappiness for their associates (Gotlib, 1992; Segrin and Dillard, 1992). Emotional sustenance works to generate well-being of both married men and married women. Although women receive less emotional sustenance compared with men, they benefit more than men from the marriage's emotional make-up (Williams, 1988). Thus, it may be inferred that spousal relations contribute quite importantly to subjectively experienced quality of life.

The concept of *crossover* applies to interpersonal relations and the mutual consequences of the flow of feeling states between individuals. Among couples, crossover occurs when one spouse's personal disposition affects his or her spouse's dispositions in similar ways (Sears and Galambos, 1992). Furthermore, crossover effects are conditional on work satisfaction or dissatisfaction experienced by working spouses (Hammer *et al.*, 2005). Crossover effects between spouses have been found in research on expatriate cross-cultural adjustment (Takeuchi *et al.*, 2002) and marital dissatisfaction (Westman *et al.*, 2004).

More specifically, *life satisfaction crossover*—the interpersonal contagion of happiness or unhappiness between marital partners—remains a neglected area of study. In the present research, we investigate the within-household crossover in life satisfaction among dual career parents. This kind of crossover effect has not been directly examined in previous research, and requires theoretical scrutiny. Crossover of happiness between spouses may be explained by the *extended self theory* (Belk, 1988, 1989; Morgan, 1993; Sivadas and Venkatesh, 1995). Based on this theory, one spouse may to some degree be psychologically incorporated as part of the other spouse's self. Extended self implies (1) personal and social aspects (i.e., the degree the spouse is a definition of the self), (2) symbolic and functional aspects (i.e., one spouse enables the other spouse to be and do what is desired), and (3) control and

attachment aspects of the inter-spousal relationship (i.e., control over a spouse relates the spouse to one's identity, as does being controlled; emotional attachment implies that the spouse is a part of the self). Given the preceding, life satisfaction for each spouse would seem to naturally cross over between the self and the extended self.

An example of extended self behavior, spanning all dimensions of the concept, is given by case materials furnished by Randi Minetor, based on interviews conducted for her book (Minetor 2002).

The case of Becky and Steven (Minetor, pp. 49–50). Becky gave her husband a wonderful gift one day. She had a high income and loved her work, and she knew that Steven wanted to put his time into recording a CD of his music, instead of working at the lower paying job he did not enjoy. She came home from work one evening and told him that he should quit his job and work on his music full time, something Steven never believed would be possible for him. When Steven's life satisfaction increased dramatically with this new arrangement, their marriage became stronger than ever. Becky says that Steven focuses on their mutual quality of everyday life, something that she often has little or no time to consider. This focus allows each of them to pursue their dreams.

The above case illustrates extended self theory, in that it shows that a male partner may be an extension of the female partner's self-identity and *vice versa*, in that (1) they both are motivated by the notion of self-actualization, (2) one spouse enables the other to achieve self-fulfillment, and (3) partners exert and accept control over each other by directly or indirectly signaling their goals and the means of achieving them. All of these factors positively affect the relationship and contribute to higher levels of happiness for both spouses.

In this work, we demonstrate the nature and extent to which such crossover is driven by workplace influences on general dispositions of individuals. These influences include each partner's personal income, pay satisfaction, and job satisfaction. Cummins (1996) identified a number of life satisfaction domains. Among these are material well-being and productivity. Personal income and pay satisfaction represent the former, while job satisfaction is indicative of the latter. Cummins meta-analyzed a number of studies and found strong and significant relationships between each of these domains and overall life satisfaction.

A Model of Life Satisfaction Among Couples

Life Satisfaction Crossover Effects

In any marital relationship, each spouse's life satisfaction may be expected to derive in some measure from the life satisfaction of the other spouse. It is difficult to be happy when a spouse is unhappy. When the marital relationship is not based in making one another happy—and, in so doing, creating a happy home for the entire family—then the relationship can easily falter. The degree of crossover

effects between spouses will depend on factors that intensify or buffer these effects (Larson and Almeida, 1999). These factors may, in turn, be characteristics of one or both spouses, and may be either stable or situational. Stable factors might include values held by either spouse, while situational factors might include coping strategies employed by either spouse, varying from occasion to occasion. Negative life satisfaction crossover between spouses, may stem from the self-centeredness of one spouse, and an inability of that spouse to recognize and acknowledge the other's unhappiness.

Working women struggle to be happy when their husbands resent their long work hours, and expect them to fulfill their traditional homemaker roles at the conclusion of a long workday (Minetor, 2002). Rusting and Nolan-Hoekswema (1998) provide an integrative model of factors affecting marital crossover that lead to gender differences in well being. According to this model, women are socialized more than men to be sensitive to others' emotions, to be more emotionally expressive than men (except for anger), to report higher levels of affect, to develop internal coping strategies, and to develop dispositional empathy. Women continually monitor and are also more sensitive to the state of their marital relationships than are men (Holzworth-Monroe and Jacobsen, 1985). Women are much more likely to self-report both positive and negative empathetic behavior (Myers, 1999).

When women are exposed to negative events in the lives of people close to them, they may be prone to express intense affect over these events and to cope with that affect by internalizing negative feelings and emotions. When negative events happen to men or their loved ones, men may be less likely to cope with the distress that they experience. In tension-laden home situations, men have a stronger physiological arousal than do women, and require longer periods to normalize their feelings (Gottman and Levenson, 1986). Husbands are typically the senders of emotion and women the receivers (Larson and Almeida, 1999). This suggests a process by which husbands exert power over their wives and by which gender stereotypes may be reproduced in families.

Westman and Etzion (1995) have summarized general processes advanced by researchers to explain crossover effects between dispositions of spouses. These include (1) occupational demands experienced by each spouse, (2) occupational demands of one spouse influencing moods (e.g., distress and dissatisfaction) of the other spouse, (3) the mood of one spouse creating demands on the other spouse, and (4) contagion of moods from one spouse to another. A number of studies have consistently shown mutual influences between spouses' feelings, and suggest that husbands' negative emotions are more likely to predict wives' negative emotions than the other way around (Gottman, 1979; Notarius and Johnson, 1982; Guthrie and Noller, 1988; Roberts and Krokoff, 1990).

Breadwinner status will affect the direction and intensity of crossover effects. Traditionally, in our culture, the concept of breadwinning is viewed as an essential element in the masculine role. The male's authority and power are traceable, in part, from the breadwinner status among partners. This may be indicated by patterns of household financial management that vary along the lines of breadwinner status (Stamp, 1985). Thus, males who are clearly breadwinners will be happier than those who are clearly not breadwinners, and these states will be radiated to their spouses.

Minetor's research revealed many situations in which the wife's satisfaction (or lack thereof) with her husband's income significantly influences the husband's life satisfaction. The tension created between spouses when one is unhappy (for a prolonged period) and the other is not can have a detrimental effect on the relationship as a whole (Minetor, 2002). On the positive side, Minetor discovered that the wife's life satisfaction improves significantly when the husband is happier in his own life choices.

Spouses may try to avoid negative crossover effects by telling each other "money lies" about earnings or expenditures (Sahadi, 1994). There is an element of risk inherent in this strategy. The truth may well win-out, resulting in mistrust between the partners and negatively affecting the relationship overall and individual levels of life satisfaction. There are two levels of hurt in such behavior: financial and emotional.

H1: There is a crossover effect of life satisfaction from one spouse to the other: (a) life satisfaction of one dual income household partner positively affects life satisfaction of the other partner, after controlling for the other spouse's job experiences and effect, (b) this will hold true for husbands and wives, but (c) life satisfaction crossover effects from wives to husbands will be greater than such crossover effects from husbands to wives.

Little is known about the particular mechanisms by which personal income may affect happiness. Personal income exerts an effect on the relationships between beliefs that serve as internal buffers for happiness. Specifically, income affects self-esteem and optimism, which, in turn, affect happiness. Beliefs may be viewed as the engine of happiness, and income as the operator.

On the positive side, women may feel that their incomes are gratifying. Higher incomes may provoke a state of independence, self-sufficiency and personal freedom. Most women earning higher incomes seek financial independence with or without a husband. The happiest wives who earn higher incomes view all household income as satisfying, regardless of its source. Happiness for these women depends on an attitude that all money is "ours," which overrides resentment or discomfort on their part toward their husbands.

In dual career households, the relationships between personal income and life satisfaction may vary between husbands and wives. Wives who out-earn their husbands, for example, may experience ambivalence in the face of conflicting social norms. Although the role of women in our society has greatly expanded in the last century or so, some women continue to believe that it is distasteful and socially incorrect for a wife to be a primary breadwinner, or the more successful partner in the family (Minetor, 2002). There is normative conflict over social roles for working, married women, regardless of their income position in the marriage.

Women often struggle for balance in the marital relationship. In order to compensate for success in the workplace, for example, some women may feel they must also succeed as homemakers. These women may feel constrained to minimize their achievements in the workplace. Working wives may feel pressure from their husbands or others outside the marriage (parents, friends, even acquaintances who appear ready to pass judgment) to camouflage their images, lest they be viewed as

unfeeling, overconfident, and/or overambitious. Even their female identity may come under attack—if they are successful, they may come to feel like and be viewed as a man.

The upward extension of wives' incomes may rob the husband of his self-esteem and his gender identity, and may violate his closely held beliefs about the marriage. This may happen, for example, when the husband is thrust into a lower earning position involuntarily (i.e., because of a layoff, disability or illness). In such cases, higher income on behalf of women may, under certain circumstances, decrease life satisfaction for both partners.

Men are often judged by the size of their paychecks and their ability to support a family. Women, on the other hand, are frequently evaluated by the exterior attractiveness and tidiness of their homes. Higher paid women, in particular, report that any satisfaction gained from completing repetitive household chores pales in comparison to the recognition and praise they receive on the job.

Impact of Job Satisfaction, Income, and Pay Satisfaction on Life Satisfaction

In general, job satisfaction is recognized as one of the most important predictors of overall well-being (Argyle, 1989; Judge and Watanabe, 1993). Levels of job satisfaction and overall well-being among married males tend to decrease when they have wives who work outside the household (Parasuraman *et al.*, 1989). Mediating factors are the effects of wives' employment on the husbands' time commitment to work and husbands' satisfaction with childcare. These same mediators likely explain variations in life satisfaction levels among husbands in dual career partnerships. Yet, no study to date has explored the effects of wives' income on husbands' well-being where breadwinner status was allowed to vary.

Job satisfaction for women reflects the perceived complexity of job requirements (non-routine, interesting working conditions). Men and women differ in the meanings attached to paid work (Gerson, 1985; Zussman, 1987). Men are better able to compartmentalize work and family spheres. Women often shape their work participation around family needs. Gender differences also exist in vulnerabilities toward given working conditions. Compared with men, women's self-esteem is more strongly related to working conditions. Men, on the other hand, are affected to a greater extent by their status and autonomy in the workplace compared with women (Pugliese, 1995).

Job satisfaction is a judgmental process reflecting affective feelings that an individual has towards a job (Smith *et al.*, 1969). These feelings can be reflected in statements such as, "My work is satisfying" or "My job is interesting." Life satisfaction is a judgmental process in which individuals assess the quality of their lives on the basis of their own unique set of criteria (Pavot and Diener, 1993). Life satisfaction can be reflected in such statements as, "I am satisfied with my life" or "In most ways, my life is close to ideal."

The relationship between life satisfaction and job satisfaction has been the subject of a great deal of research (Schmitt and Mellon, 1980; Tait *et al.*, 1989; Judge and Watanabe, 1994; Cramer, 1995; Adams *et al.*, 1996; Kossek and Ozeki, 1998). As stated by Tait *et al.* (1989, p. 502) "It is generally assumed that job and

life satisfaction should be related to one another because, for many people, work is a significant and central aspect of their life" (in terms of both time and emotional involvement).

As a result, people are believed to have a difficult time separating their feelings about work and life in general, a tendency that is heightened by the importance that is attached to work in American society." Researchers have also called this the "overlap" effect which tends to be supported by positive correlations between job and life satisfaction (Judge and Watanabe, 1994; Cramer, 1995). When the "overlap effect" from job to personal life occurs, it is pervasive, equally affecting every domain of personal life (Small and Riley, 1990).

With few exceptions (Cramer, 1995), research has shown a positive correlation between job and life satisfaction (Schmitt and Mellon, 1980; Tait *et al.*, 1989; Judge and Watanabe, 1994; Adams *et al.*, 1996; Kossek and Ozeki, 1998). Life satisfaction also has been viewed as a positive outcome of job satisfaction and a negative outcome of role strain (Iris and Barrett, 1972; Adams, King, and King, 1996; Netemeyer, Boles, and McMurrian, 1996; Babin and Boles, 1998).

For married working wives, job satisfaction may be tempered by the wife's anger and jealousy of the husband if the husband appears to have more opportunities for enhancing life satisfaction than does the wife. The wife's anger and jealousy may intensify if the husband's life satisfaction opportunities are made available because she is working, whether or not her work is by choice. Married working women may feel entrapped by their jobs and paychecks and locked into jobs that are highly demanding because of the family's lifestyle (i.e., if the family could not afford to live in the manner to which it is accustomed to without the wife's income, etc.) (Minetor, 2002). However, a relationship between job satisfaction and life satisfaction has been found for men and women (Tait *et al.*, 1989) and the strength of the relationship directly related to the degree of work involvement (Steiner and Truxillo, 1989).

To understand how pay satisfaction may drive life satisfaction, it is first necessary to understand the interpersonal processes that lead to pay satisfaction levels. Some theories of pay satisfaction involve the concept of pay referents. That is, pay satisfaction depends on self comparisons with pay referents such as family members and close friends, colleagues at work, others who hold similar jobs elsewhere, people with the same education and experience, and immediate supervisors. One study (Varca, Shaffer, and McCauley, 1983) found occupational level of pay referents as a moderator of gender differences in pay satisfaction. Upper level men and lower level women were more satisfied. Using relative deprivation theory, the authors explained that upper occupational level women may have seen their pay as unfair in the context of higher level work, while women at lower occupational levels have a lesser expectation and are more easily satisfied with their pay.

Another study showed that when family members and close friends are used as referents, relative pay satisfaction significantly affects overall pay satisfaction (Law and Wong, 1998). While actual income and pay satisfaction are modestly related, other factors are important determinants of pay satisfaction. These include want for pay, past expectations, personal standards of salary equity, and comparisons with similar others (Sweeney, McFarlin, and Inderrieden, 1990).

Gender differences in job satisfaction have been investigated by Mason (1995). Findings from this study suggest that structural theory may explain gender effects on job satisfaction. Impoverished structures (with less prestige and power) may foster communal roles, while enriched structures (with more prestige and power) foster agentic learning. Sources of job satisfaction reflect experience in these structures. Under social role theory, gender affects job satisfaction in the following way: when the gender role is salient in the job, men and women will evaluate job satisfaction similarly in enriched structures and differently in impoverished structures. There is little evidence, however, to support the notion that socialization effects explain differences in the ways men and women evaluate their job satisfaction levels.

A widely held explanation for weak effects of money or pay on happiness is that it is relative income, rather than actual income, that makes people happy. Clark and Oswald (1996) found that satisfaction with pay was less if the spouse or other household member earned more, suggesting a comparison process. Women often have the perception that they are paid less compared with men even when they do the same kinds of work. Frequently these perceptions are accurate. Some women believe that they are entitled to smaller earnings simply because they are women and they accept their lower income positions when they compare themselves with other women in the same circumstances (Jackson, 1989). When women do the same work as men, however, they compare themselves to men and are no longer satisfied with lower wages (Loscocco and Spitze, 1991).

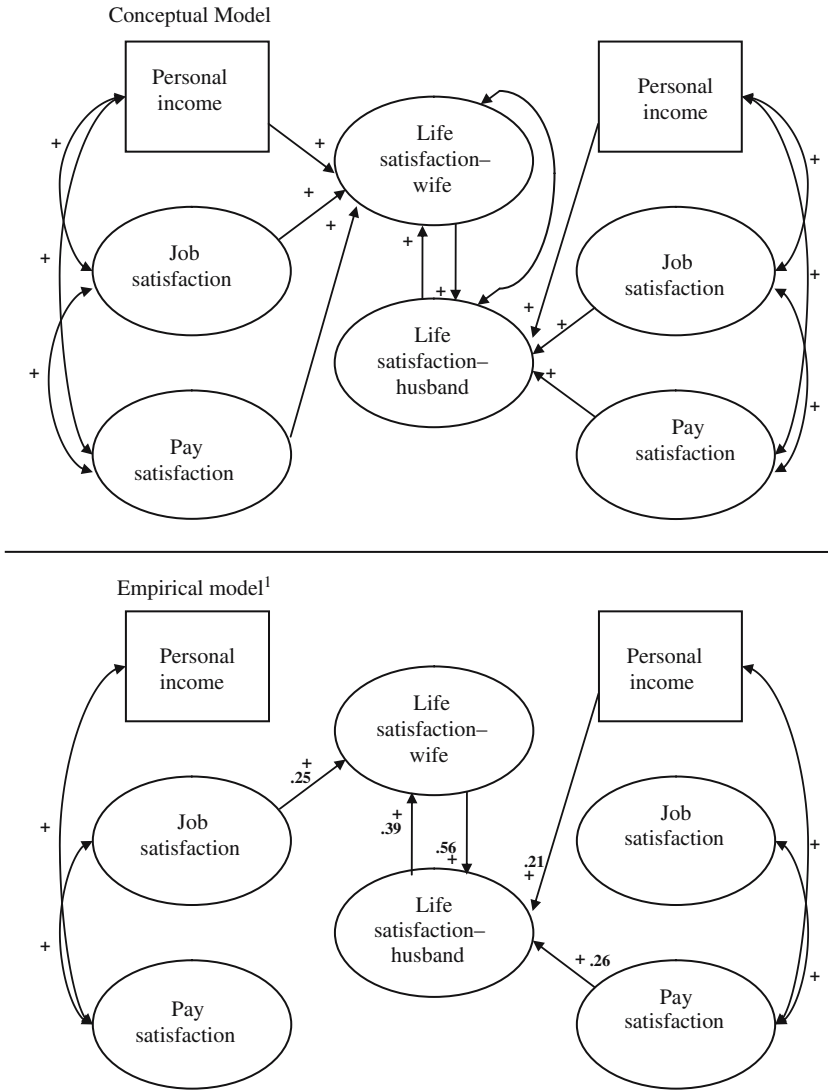
For men, self-esteem and personal control are strongly linked to the size of the paycheck. Compared with women, men are more concerned with high pay, good security, and opportunity for personal control (Mottaz, 1986). Women, on the other hand, are more responsive to supportive supervision and relations with colleagues at work; these conditions generate higher life satisfaction. Compared with men, women are also more interested in the total income of the household and the lifestyle that is enabled (Mottaz, 1986; Pugliese, 1995; Piltch *et al.*, 1994; Roxburgh, 1996).

Minetor (2002) found that when both partners in a relationship are satisfied with their work situations—be these in outside workplaces or at home—life satisfaction is highest. A spouse's lack of job satisfaction, on the other hand, has an immediate and pronounced negative effect on life satisfaction for both spouses.

H2: Each partner's job experiences affect his/her own life satisfaction: (a) these factors will exert different levels of influence on the life satisfactions of husbands and wives, (b) job satisfaction will have the strongest direct effect on life satisfaction of wives, stronger than personal income, or pay satisfaction, and (c) the relationships of personal income to own life satisfaction and pay satisfaction to own life satisfaction will be stronger for men than for women.

Impact of Income on Life Satisfaction

Husbands' experiences at work are a significant source of emotional transmission to their wives. Women appear to be better able to contain job stress and therefore



1. Although the entire hypothesized/conceptual model was estimated (see above), only significant ($p < .05$) paths are indicated; all path coefficients are standardized; $\chi^2 = 128.42, df = 91, p = .006$; $CFI = .96$; $IFI = .96$; $RMSEA = .07$ (the χ^2 for the null was 957.41, $df = 120$).

Fig. 1. Conceptual and Empirical Models.

avoid negative effects on their spouses, and, at times, may even transmit their work stresses in relatively beneficial ways (Larson and Almeida, 1999).

In what follows, the two heretofore mentioned hypotheses are examined based on a survey of dual career spouses. Crossover effects on happiness and concepts for occupational life experience are measured and tested. The hypothesized model is shown in the upper portion of Figure 1.

Method

Sample and Procedure

Participants in the current study were the parents of students from undergraduate marketing classes at two small to mid-sized universities, one located in the New England region of the United States and the other in the Midwest. As a means of voluntarily earning extra course credit, all students delivered questionnaires to both their mothers and fathers, who, in turn, were instructed to mail completed questionnaires back to the course instructor. Cooperation was complete.

Questionnaire delivery schedules were rotated across mothers and fathers within households, such that each parent completed the questionnaire at a different time, to minimize bias due to experimental method. The first questionnaire was completed and returned before another questionnaire was dispatched to a household in an effort to minimize within-household bias. Other instructions on the questionnaire informed the participants that there is no right or wrong answer to any of the questions, and that all responses would be kept completely anonymous.

Although all student-parents were eligible to complete a questionnaire, only *married couples where both spouses were working* (i.e., dual income or two-earner families) were retained for analyses in the current research, ultimately resulting in 86 married couples (the unit of analysis in this case). This represents a 100% response rate as every parent-couple who was eligible was included in the sample. In terms of education, 32% of the females and 41% of the males had a college degree or more (i.e., postgraduate schooling or degree, etc.). The three most common occupational categories for females were professional or technical (40%), clerical or sales (26%), and business manager (21%). Among males, the three most common occupational categories were professional or technical (54%), business manager (18%), and skilled manual craftsman (13%).

Measures

The scales used in the current study, the majority of which are multi-item measures, were previously published and established instruments. Correlations between scale scores and means for the scales from study data are shown in Table 1.

Job satisfaction. The *job satisfaction* concept refers to one's general satisfaction with one's job and is a component scale of the Occupational Stress Indicator (OSI)

Table 1. Correlation Matrices and Variable Means.

Variable	PI	JS	PS	LS	Mean (SD)
Personal income (PI)	1.00	-.06	.23	-.15	—
Job satisfaction (JS)	.12	1.00	.61	.34	6.1 (2.19)/ 6.1 (2.09)
Pay satisfaction (PS)	.34	.67	1.00	.08	5.5 (2.11)/ 5.9 (2.37)
Life satisfaction (LS)	.36	.31	.44	1.00	5.0 (1.23)/ 5.0 (1.27)

Female and male correlations are above and below the diagonal, respectively; and, significant correlations ($p < .05$) are underscored. Female and male scale score means (and standard deviations) are stacked above and below, respectively, in the right-most column.

instrument (Evers, Frese, and Cooper, 2000). In its entirety, the OSI consists of 25 subscales with a total of 167 items measuring occupational stress and stress-related personality and outcome variables. The job satisfaction subscale, or general job satisfaction scale as referred to in the OSI, contains five, ten-point Likert-type items (1 = not satisfied at all; 10 = very satisfied) pertaining to one underlying general job satisfaction factor. Although we included the original five items on our questionnaire, we utilized a two-item version of the scale (or factor) to test our model (see below). The two items that were retained are strongly correlated within the female and male groups (for the two items, r 's = .84 and .85 for the female and male samples, respectively).

Pay satisfaction. Also a part of the OSI, the pay satisfaction scale (or subscale) measures one's level of satisfaction with one's pay at work. Similar to the job satisfaction measure above, this scale in its entirety contains five unidimensional, ten-point Likert-type items (1 = not satisfied at all; 10 = very satisfied). Based on correlational analysis, as well as Cronbach's coefficient alpha (α), we utilized a three-item version of the scale/factor that is comparable across both female and male groups (for the three items, α 's = .87 and .92 for the female and male samples, respectively).

Life satisfaction. The final multi-item measure was the Satisfaction with Life Scale (SWLS). Developed by Diener, Emmons, Larsen, and Griffin (1985), this unidimensional scale measures one's global life satisfaction. This scale also contains five original items. In the present study, scale items follow a seven-point, Likert-type format (1 = strongly disagree; 7 = strongly agree). Here, too (based on correlational analysis and Cronbach's coefficient alpha, etc.), we utilized a two-item version of the scale that is comparable across female and male partners (for the two items, r 's = .72 and .83 for the female and male samples, respectively).

Personal income. Personal income was measured via a single-item measure of each respondent's individual income (before taxes) in the preceding year. Participants were asked to choose between nine income brackets: under \$20,000; \$20,000–\$24,999; \$25,000–\$34,999; \$35,000–\$49,999; \$50,000–\$74,999; \$75,000–\$99,999; \$100,000–\$149,999; \$150,000–\$199,999; and, \$200,000 and over. Forty-five percent of the females made over \$35,000 a year (the mode for this group was the \$25,000–\$34,999 bracket at 28.6%), and 39% of the males made over \$75,000 a year (the \$50,000–\$74,999 bracket was the mode for the males at 30.6%).

Results

Confirmatory factor analyses. In addition to estimating correlation and alpha coefficients (see above), we also conducted confirmatory factor analyses (CFA) in order to fully assess the reliability and validity of the multi-item measures. CFA models were estimated using the *EQS* software package and *ML* estimation. Specifically, two three-factor measurement models were estimated, one each for the female and male samples (there were seven items total in each model). The factors in this and subsequent analyses represent latent variables, each indicated by a set of uni-dimensional items (two to three items per factor—see above). Here and elsewhere, only completed cases for each item were utilized for analysis (i.e., mean substitution techniques were not employed, etc.), and analyses were judged to be adequate based on commonly utilized fit statistics including but not limited to *CFI* and *IFI*. Generally speaking, values over .90 are deemed acceptable for these indices.

The results of the CFA analyses suggest that our measures are satisfactory: *female measurement model*— $\psi^2 = 5.84$, $df = 11$, $p = .88$; $CFI = 1.00$; $IFI = 1.00$; $RMSEA = .00$ (the ψ^2 for the null was 334.03, $df = 21$); *male measurement model*— $\psi^2 = 13.61$, $df = 11$, $p = .26$; $CFI = .99$; $IFI = .99$; $RMSEA = .05$ (the ψ^2 for the null was 473.56, $df = 21$). Across both samples, all items loaded significantly on to their respective factors (p 's < .05).

Hypothesis testing. Our hypotheses concern *spousal* crossover effects of life satisfaction (*H1*) as well as various job-related determinants of life satisfaction (*H2*). Again, using the *EQS* software with *ML* estimation, we tested the structural model illustrated in the top portion of Figure 1 (hypothesized/theoretical model). The complete results of our analysis (i.e., empirical model), including all relevant statistics, are portrayed in the bottom portion of the same figure (see Figure 1). It is worth noting that, due to the theory-driven a priori predictions, we did not test alternative models. Furthermore, we did not conduct multi-sample analyses as the "samples" (husbands and wives) are not independent of one another and we are necessarily interested in modeling the interaction of husbands and wives within couples (i.e., crossover effects). In this way, the couple represents the unit of analysis in the current study.

In support of *H1a* and *b*, the results suggest that the life satisfaction of one dual income partner/spouse positively affects the life satisfaction of the other partner,

Table 2. Summary of results according to hypotheses.*

Hypothesis	Result
One	
There is a crossover effect of life satisfaction from one spouse to the other	
(a) life satisfaction of one dual income household partner positively affects life satisfaction of the other partner, after controlling for the other spouse's job experiences and effects,	fully supported
(b) this will hold true for husbands and wives, but	fully supported
(c) life satisfaction crossover effects from wives to husbands will be greater than such crossover effects from husbands to wives	fully supported
Two	
Each partner's job experiences affect his/her own life satisfaction	
(a) these factors will exert different levels of influence on the life satisfactions of husbands and wives,	partially supported
(b) job satisfaction will have the strongest direct effect on life satisfaction of wives, stronger than personal income, or pay satisfaction, and	fully supported
(c) the relationships of personal income to own life satisfaction and pay satisfaction to own life satisfaction will be stronger for men than for women	fully supported

* Results correspond to Figure 1.

and this effect is consistent across both wives and husbands. In support of *H1c*, the findings also suggest that the crossover effect from wives is greater compared with the reciprocal effect from husbands.

With respect to the work domain impact on life satisfaction, we find mixed support for our hypotheses. *Hypothesis 2a* is partially supported in that job satisfaction (only) is a determinant of life satisfaction among the females, and personal income and pay satisfaction (only) are determinants of life satisfaction among the males. *Hypothesis 2b* is supported as job satisfaction has a stronger effect on life satisfaction, compared with either personal income or pay satisfaction for the females (wives). Finally, *H2c* is supported in that both personal income and pay satisfaction are significant determinants of life satisfaction among males (husbands), while these same variables fail to affect significantly female life satisfaction. The results are summarized according to the hypotheses in Table 2.

Summary and Discussion

This is the first study of crossover effects of life satisfaction between working husbands and wives. A previous study (Doumas, Margolin, and John, 2003) has examined the vicissitudes of daily work to family spillover that is, responses to workplace situations and events that impact individuals when they return to the home environment, and consequent spousal interactions. That study showed that daily spillover behavioral patterns are short-lived in their transmission between spouses. In distinction, the present study concerns a more enduring psychological state—life satisfaction. Probing the *roots* of life satisfaction of working spouses, our study has advanced knowledge of ways by which the work domain differentially affects life satisfactions of males and females in dual career households.

The hypotheses (and corresponding model) advanced in this study have been largely confirmed. So what does this tell us about life satisfaction as it operates in a marriage relationship? In principle, crossover of happiness between spouses may be explained by the concept of *extended self* (Belk, 1989), in which the person psychologically incorporates a spouse into the self. Aspects of the extended self condition are its self-defining character, as well as its facilitating and control functions. Results of this study are consistent with the theory, but are not definitive. A stronger test must clearly introduce the time dimension to empirically describe the crossover process. Additionally, such a test must introduce the degree to which the spouse sees the partner as a self-extension. With extended self as a variable, it would be expected that self-extension and crossover of life satisfaction would be strongly related in a positive way. This theoretical relationship would be refined further by the introduction of gender effects.

In general, wives are more *in touch with and responsive* to their own feelings, emotions, and dispositions than are their husbands. Wives are more *expressive* of their own conscious feelings, emotions, and dispositions toward their husbands, than are husbands similarly expressive to their wives.

This may be attributable, in part, to sex role socialization as to what is feminine and what is manly. Based on the foregoing, it may be inferred that wives radiate their life satisfaction (or lack thereof) to their husbands with a greater frequency and intensity as compared with the same process on behalf of husbands with respect to their wives.

For both males and females, work domain experience affects individual life satisfaction levels. The process by which this experience exerts influence is, however, very different across the sexes. Gray (2002) observes that males compared with females are more goal-oriented, which includes *extrinsic* goals of work (income and pay satisfaction). Females, on the other hand, are more affected by the quality of relationships on the job (job satisfaction) and not so much by how much money they make (Gray, 2002). Gray stresses that the quality of support females receive in the workplace is more important than money. Males more likely value a job if it reflects on their competencies and enhances their status. For many males, higher income is an important symbol of status-conferral. Females are more likely to value a job that offers them quality interpersonal communications, consideration and relatedness, as well as favorable working conditions.

Another explanation of the differences in the way males and females respond to the work domain and shape their life satisfactions may be found in identity theory (Desrochers, Andreassi, and Thompson, 2004). The content of male and female identities is reflected in different meanings of work and family roles. Men are more likely to view work and family as interdependent and combinable for the male role. Women, on the other hand, view work and family as independent and at odds with each other in the performance of female roles. Another factor in sex-role identity salience is that many jobs historically have been designed specifically for men, whether or not they are being done by women (Rothausen-Vange, 2004). Similarly, socialization for family work has not created a strong sense of male commitment in this domain. So work has not become degendered, while household labor and responsibilities have largely remained gendered. This reinforces a gender-specific orientation to work and how it shapes life satisfaction.

Theoretically speaking, these differences might be affected by sex role differences in such areas as attributions of success or failure, need for achievement and affiliation, direct versus vicarious achievement motives, and fear of success. The scope of the present study does not, however, allow for empirical testing of these explanations. Future research should not only test these findings in other populations of married couples but should also introduce additional motivational variables that may not only differentiate spouses, but also provide more definitive empirically based explanations of life satisfaction crossover effects.

Finally, it would be useful if future empirical models of life satisfaction crossover were expanded to include additional, theoretically significant *interactive* inter-spousal variables. Specifically, causal modeling in future investigations of life satisfaction crossover among couples might include measurement of *joint effects* for each spouse of (1) extended self, incorporating his or her spouse (Sivadas and Venkatesh, 1995), and (2) marital satisfaction. In principle, these and related mechanisms will importantly advance our understanding of how marital partners influence each others' life satisfactions.

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Migrant Family Adaptation and Quality of Life: A Qualitative Study in Brazil

CYNTHIA HARR

Introduction

Each year thousands of families migrate to escape political or religious persecution, natural disasters, improve their economic situation, or provide for themselves a better life than was possible in their former country (Baptiste, 1993). Whatever the motive for migration, the major changes involved can often cause physical or emotional chaos in the lives of the family which can lead to a diminished rather than improved quality of life. Countries such as Brazil and the United States, although quite different economically, culturally, and politically, are experiencing similar migration and immigration challenges as there is increased turbulence in various areas of the world. One profound challenge facing these countries and others on all continents is the successful integration of migrating families into their society in such a way that the quality of life (QoL) of both their citizens and the migrants may be maintained. This qualitative study examined the influence of social support and family relationships on migrant family adaptation and QoL in the country of Brazil.

The varying meanings and concepts applied to QoL have made it difficult to define and directly measure. Both congruity theory and multiple discrepancy theory propose the concept that life satisfaction and QoL are determined by the perceived gap between actual and ideal life circumstances (Hunt, 1997; Welham *et al.*, 2001). The World Health Organization Quality of Life Assessment Group defines QoL as: “an individual’s perceptions of their position in life, in the context of their culture and value systems in which they live and in relation to their goals, expectations, standards and concerns” (Skevington, 2002, p. 136). Researchers examine objective and/or perceptual indicators of individual and family quality of life. Objective indicators focus on the conditions of life and environment, while perceptual or subjective indicators of life quality are related to the experiences of life (Rettig and Leichtenritt, 1998, pp. 307–341; Wrosch and Scheier, 2003, pp. 62–63). Perceptual indicators related to the life experiences of the participants are the primary focus in this study.

Review of the Literature

Social Support Systems

Social networks are the channels through which emotional and psychological support can be exchanged between individuals. The moderating effect of social networks on mental well-being is more pronounced among those experiencing the highest level of stressors and is directly related to the individual's quality of life (Achat *et al.*, 1998, pp. 735–744; Helgeson, 2003, p. 26). Social support systems are crucial to the adjustment of an immigrant and act as a stress reliever and source of strength while their absence is a major cause of stress in the life of the migrant. As migrants separate from their culture of origin, they often leave behind the relationships that provided security and comfort. These relationships reinforced self-identity and social networks and as well as defining daily activities and purpose (Ahearn, 1995).

Upon initial arrival migrants tend to focus on cultural differences, however, the longer they reside in the host culture, the more cultural similarities are perceived. Immigrants experience pressure to conform to the norms and pressures of the new society and may experience greater frustration and a sense of failure during the first years. It is thought that as immigrants' intercultural experiences accumulate over time, they become more certain about the interaction patterns and their positive affect toward the host country becomes greater. Active and effective communication with members of the host society provides the immigrant with greater insights, a more favorable attitude, and greater satisfaction with the host society. Participation in the larger social system of the host society seems to be vital for the acculturation of the immigrant (Kim, 1978; Bhagat, 1999; Caliguiri, 2000).

Migrant Family Conflict and Cohesion

The quality of family life is an important indicator of overall life quality. The resource theory perspective of family life quality assumes that families provide both symbolic and material resources. Family life quality exists when the personal needs of family members are met through exchanges of resources that lead to life satisfaction. Resource theory assumes that the family is the social institution where there is the greatest potential for needs to be satisfied through the range of resource exchanges among the members (Rettig and Leichtentritt, 1999).

Although immigrant families experience conflicts and tension due to additional stress, the support system of the family is often still the main agent through which the adjustment to migration occurs. It is more likely that there will be transitional conflict if the migration is forced rather than the choice of all family members or if the host culture is not easily compatible to the culture of the migrating family. Both intrinsic and extrinsic issues of transition are determining factors in the adjustment of the family unit. Problems of acculturation are more easily overcome if the family has emotional and financial resources as well as social systems in the host country upon which they can rely. During the period of acculturation, the family must sever ties with familiar people and places and transplant their home, their dreams, their lives to the new country (Ben-David, 1995; Hernandez and McGoldrick, 1999, p. 172).

Research has shown a link between acculturation stress and interpersonal conflicts within the family. Immigrants studied indicated more conflict among family members than was found in the general population. In some studies, behavior disorders among children and divorce were found to be more common among immigrants than the native population. Changes attributed to the migration process are intensification of interpersonal conflicts, changes in patterns of closeness and distance regulations, and changes in patterns of conflict resolution. Domestic violence, which in some cultures is tolerated or accepted, may occur more frequently due to increased stress even in a host culture where such action is considered unacceptable. Conflict may also be a result of the varying rate of absorption of the different family members into the new culture (Ben-David and Lavee, 1994; Burke, 1980; Ho, 1987; Raj and Silverman, 2003).

Family members face different kinds of and levels of stress and are sensitive to differing aspects of the adjustment process. The different rates of acculturation within the family often result in changes that affect the roles and hierarchy with the family unit (Leslie, 1993; Matsuoka, 1990). Living in a new culture, parents may not be able to provide appropriate socialization and role models for their children. Parents and elderly family members tend to cling to old values, beliefs, and norms while children absorb those of the host culture (Ahearn, 1995; Cheung, 1989; Kibria, 1994; Lee and Chen, 2000). The difference in acculturation of family members to the new culture is a cause of stress and conflict within the family unit and the individual members who are a part of it (Dugsin, 2001; Hernandez and McGoldrick, 1999, p. 178). Role ambiguity is directly related to stress and the migrant is frequently forced to choose between meeting the role expectations of the culture of origin or the new culture, never truly having success in fulfilling either (Padilla, Wagatsuma, and Lindholm, 1984).

Other studies indicate that immigration has a cohesive effect on some families and that there may even be a lower level of tension in these families (Hartman and Hartman, 1986). During periods of transition the migrant tends to cluster around the family, to need and value the family more. Family cohesion and adaptability have been found to relate to a family's ability to react under stress, although care must be taken in the evaluation of a family due to cultural differences in norms. An adaptable family is defined as a family which is able to change its power structure, roles, relationships, and rules in response to stressful situational and developmental stress. The long distance migration of a family often requires joint decision making within the family which may result in a change from a gender related uneven power balance to the emergence of a more equal power balance within the couples. The immigrant family must have flexibility in order to change and adapt to the circumstances it encounters (Ben-David, 1995; Smits *et al.*, 2003).

Qualitative Research

The study was conducted in the Latin American country of Brazil with the goal of investigating the impact of social support, family support and relationships on the quality of life of migrant families. Previous research has for the most part focused

on the migration experiences of those relocating to developed regions such as Europe or North America. This study allows for a comparison with results of other studies and promotes recognition that migration is a world wide phenomenon.

While cross-cultural quality of life research can provide valuable theoretical insights as to whether QoL is a universal or relativist concept, it poses several challenges particularly in the development of questionnaires and measures which can be used in various cultural contexts. Careful qualitative research is fundamental for providing a basis for the development of quantitative instruments and in determining whether an existing instrument should be adapted for use in a particular culture. It is also critical for the correct interpretation of results (Herdman *et al.*, 1998; Skevington, 2002). When a Quality of Life instrument is used in various cultural settings, it is vital to establish if the relative subjective importance of the different aspects which contribute to life quality is stable across cultures (Saxena *et al.*, 2001).

Description of the Setting and Participants

The location of the study was the southern state of Brazil, Rio Grande do Sul. The immigration history of the state shows the presence of large German, Japanese, Italian, and Eastern European groups that greatly influence the culture found in the area. With the establishment of the South American common market, migration to the area from Uruguay, Argentina and other Latin American countries is increasing. The development of foreign industry in the area has also brought in families from Africa, Arabic countries and others. With its background of native Indian culture, Gaucho influences, and Portuguese heritage, Rio Grande do Sul is a culturally diverse society. However, the people are very individualistic and proud of their unique "Gaucho" heritage. Those moving into the south of Brazil, including Brazilians from other states, do not find it easy to establish themselves within this society.

Families studied were residents of the capital city of the state, Porto Alegre, or of an agricultural community, Ijuí, in the interior of the state close to the border of Argentina. Porto Alegre and its suburbs are estimated to have a population of approximately three million. It is recognized as one of the most modern cities of Brazil with shopping centers, industry, and public transportation. The state governmental offices, museums, theaters, and medical centers are located in the area. In contrast, Ijuí with a population of approximately twenty thousand is one of the largest communities in the more rural, western part of the state. It is surrounded by farms and ranches and is strongly influenced by the presence of European immigrant descendants. Goods and services are not as easily obtained there, although the city offers most modern conveniences.

Participant families were chosen for the study through a combination of availability sampling with snowball sampling. A total of nine families were involved in this qualitative study. Participants came from a variety of different countries and continents. This provided opportunity to determine commonalties that persist among the immigrant/migrant population despite variance in culture and country of origin. The countries of origin of those interviewed were Russia, Canada, Holland,

Costa Rica, Uruguay, Ecuador, and Angola. The participants in those families that were interviewed ranged in age from 28 years to 52 years. Seven of the families had minor children who had migrated with them while the remaining two had children in their twenties who are residing in their country of origin.

Interviews

Individual interviews of approximately three hours were conducted with each spouse in their home or place of employment. Both open and close ended questions were asked as a part of the interview process. Interpreters were provided for those individuals who did not fluently speak English or Portuguese. Participants were asked to sign a consent form which was translated into three languages; English, Portuguese, and Spanish. Participants provided input concerning their quality of life and adaptation as well as that of the other family members. The researcher also met with some of the couples as time permitted for a joint session. Informal culturagrams of the families were done as part of the data obtained during the interviews (Congress, 1994). The researcher clearly stated to participants the purpose and procedures of the study. Confidentiality was maintained through out and the results shared with the participant families.

Data Analysis

Data analysis was ongoing throughout the study. Triangulation of data was accomplished through the combined use of transcripts, interview notes, tape recordings, and observation notes as these were organized and sorted. A coding system was developed as commonalities and differences between the various families and family members were noted. Plausible relationships between concepts were explored as patterns developed. Focus was placed on specific areas of concern indicated in the review of the literature, however, the researcher also sought to discover other previously unrecognized factors which affect cultural adaptation as well. The focus of the research was on grounded theory. Phenomenological aspects were also explored with the inclusion of interview questions that dealt with the participants' philosophical reflections on the meaning of these experiences and the perceived changes in their QoL.

Results

Relationships and Social Support

Relationships proved to be an area of critical importance to the adaptation and QoL of the migrant families. The formation of friendships with nationals was limited by lack of knowledge of cultural norms, language barriers, and lack of commonalities. Relationships with other ex-patriots provided understanding of common experiences, but were also limited due to time factors and common interests. With the exception of the Russian immigrants, those interviewed also had very little contact

with people from their own country. Many of the participants responded that they had no real support system in the country in Brazil. Most expressed a lack of true, in-depth friendships. They indicated that those friendships they had developed with both nationals and ex-patriots were "exaggerated" or surface friendships of convenience. Integration into the society was difficult due to the lack of relationships with those who would provide entry into various aspects of society and information as to cultural norms.

When discussing friendships, a sense of sadness pervaded the conversations. Although many participants stated that they had several acquaintances, they did not consider these people true friends. The following statements reveal their thoughts. "I can't say that we have Brazilian friends. We have had two or three families to have us over, but to say that they are friends . . . Friends are people that you can count on when having a difficulty." "I respect them and some I like, but they're not friends in the sense that we share and talk." "We don't have close friendships with Brazilians. We visit in the homes of some. But in the hour of need I would never seek them out." Migrants spoke about the fact that there is a really basic lack of comprehension on the part of the nationals who do not seem to understand them and their migration experience.

Friendships with nationals were not the same as those that they had left in their country of origin. During the interviews it became clear that the issue of friendships was very sensitive and an unresolved area of adaptation for the participants. Major concerns were the desire to have close friendships, the isolation that many migrants felt, and the lack of understanding as to how to develop meaningful relationships in this different culture. They spoke about how difficult it was to learn the "rules and regulations" of the country. One woman talked about the fact that it takes time to learn what people are sensitive about so that you can be honestly tactful when discussing issues such as a national policy.

The longer a couple had been in the country, the more socialization there tended to be. Although a few of the participants indicated that they socialized frequently with nationals, the majority seemed to feel uncomfortable in such situations. One man stated, "I don't know why. I don't feel pushed or awkward, but not comfortable. Customs are so different. It's very strange for me." Another said, "I feel some tension. I don't feel comfortable. I am only comfortable in my own home." While the participants were capable of functioning in the society to which they had migrated with minimal difficulty, few were truly integrated into the culture. Most continued to emphasize their cultural traditions and participated only minimally in the traditional holidays and celebrations of the country. The participants watched national television for the primary purpose of obtaining the world news. For most, visits in the homes of nationals were few; as were visits of nationals to their home. However, in the few cases where participants had a close Brazilian friend, the value of that friendship was very apparent.

Parents reported that their children faced similar challenges in adjusting to Brazilian society and developing friendships. Several were worried about the lack of opportunities for appropriate socialization for their children. One mother shared the difficulty her daughter experienced in dealing with feelings of rejection. Another parent stated that her young son plays alone. He greatly misses his friends

and talks about them often. His parents feel that he has suffered the most with the move. However, other parents felt that their children have adapted well and have actually developed greater skills at forming friendships out of necessity. For the most part the children have Brazilian friends, although the parents indicated that they seem to find it easier and more comfortable to form friendships with children who have migrated. Despite the lack of intimate friendships and their perceived diminished quality of life for themselves and their children in the area of social support, only a few migrants indicated a desire to return to their country of origin.

Family Relationships

Cohesion. In the area of unity between husband and wife, the participants all indicated that their relationship had grown closer or at least remained the same since their migration. There was little hesitation on the part of the participants as they expressed their appreciation and need of each other. One woman commented, "When we left our country we became closer as a defense. He is always asking me now if he can help with things. He has changed. Here we spend more time together." Her husband remarked, "I think there is more unity now between my wife and I. We are together professionally and also with concerns about our family in Russia. I give her support, she gives me support." Another husband said, "We are more united. We tie ourselves closer together because we don't have a large base of interaction. As a couple this has helped us because of an increased interdependence." His wife responded, "Our family is closer, more united. My husband gives more affection. His actions are more loving and caring."

Others referred to the fact that they spend much more time together than they did before. One woman said, "We are physically together more. We were all in different places. Now we are more together and this has helped our unity in other ways. For three years I practically talked only with them. It brought us closer together." In connection with this, some shared that the fact that they have few friends causes them to look to each other for friendship. Some husbands indicated that they were aware that their wives had made a sacrifice to be with them and expressed their appreciation.

A businessman shared his feelings about his family since the migration saying, "Our experience here has especially brought us closer. It has been a way of uniting our family. Today we are much closer and I have learned to love my family much more than I did there." His wife talked about how family time has become very precious and special. A woman participant simply said, "Your husband has to be your best friend. If I didn't have a husband who was there for me, I couldn't do it. You've got to have that support."

As these statements indicate, marital cohesion was found to be a significant factor in the successful adjustment of a family to a different culture and country and to their QoL. The families found mutual support and unity vital to their survival in a new and different culture far from other established support systems.

Conflict. Although mentioned often in the literature, increased conflict in the marital relationship did not appear to be a significant factor in the adjustment of

these couples to the new culture. The participants indicated that most conflict they experienced was typical of that which had occurred before their migration concerning issues such as finances or children. However, there were two areas mentioned that were related to migration issues. The first area of conflict concerned the issue of the possibility of returning to the country of origin permanently or for visits. In these conflicts, the wives wanted to return while the husbands did not. One man said:

I was the one responsible for taking my wife to these places. She didn't have much option. She made me responsible and I felt responsible. It brought tension to us. Her land was a long way away. Her family was far away. It weighed on our relationship.

Their family has attempted to resolve this by making as many trips to visit family as is financially feasible.

The other area of conflict had to do with changes in roles and responsibilities. Most participants did not indicate any significant change in their present roles within the family versus their pre-migration roles. The only significant change in marital roles mentioned was the assumption of new responsibilities, such as driving, due to the spouse's lack of comfort in performing this task in Brazil or due to the spouse's lack of time. One woman said, "We had to learn how to function the best. We had to find what we could do best and redefine responsibilities for our life here in Brazil. Until we did that there were difficulties which caused some conflict."

The other significant area of interpersonal and intrapersonal conflict concerned the parenting role, especially in the area of discipline of children in the Brazilian culture. Without exception, participants spoke of this as a cultural norm that they would not accept. This was true despite the varied cultural background of the participants. All viewed the discipline in Brazil as inappropriate and a potential area of conflict between them, their children, and the culture. One man stated, "It is a challenge raising them because we live by two different sets of rules. The discipline is different here. Brazilians don't accept what we consider good discipline. We expect more from our children." His wife added, "It is hard to explain to our children why they can't do things that other kids do. There really isn't discipline in most of the homes I have seen."

The parents of the Russian teenager faced numerous challenges in determining what was appropriate and what was not. The father stated:

There are enormous differences. There we always put barriers and didn't have freedom. We expect manners, rules of behavior, respect for elders and professors. Here there is so much freedom. They dress like they want. I don't let her use earrings there, here yes. I have to put limits on her. We have adapted to the reality here. I have lessened the limits. We had so much conflict because I was so strict. Now I have decided to give her more liberty and respect her personality. I try to teach her to be different in some ways.

The issue of respect was common among the participants and of great concern to them all. One father stated it clearly: "In my culture my child would never talk in

a loud voice to me. But here children do it all the time. I am afraid that they will assume these ideas.” Another parent said: “I think that Brazilian children have poor manners. The way they treat adults is rude. I have to teach my children not to act like this. I tell them that we are in a country in which we have to copy the good things not the bad.” Some of the parents also expressed concern for the liberal behavior permitted in the schools as well as what they perceived of as an acceptance of lower morals. While the participants desired to see their children adapting in this new culture, making friends, and having success in school; they hoped that the children would not assimilate the disrespect and lack of manners. Rather they had made firm decisions to discipline their children and educate them according to their culture of origin.

Discussion

The migration experiences of these families support the review of the literature that indicates the important contribution that family and social support systems offer to the successful adaptation and quality of life of the migrant. It also demonstrates the negative impact on the migrant quality of life when such support is absent. The formation of relationships with nationals can be limited by lack of knowledge of cultural norms, the barrier of language and lack of commonalities. While the participants in the study were capable of functioning in the society to which they had migrated, few were truly integrated into the culture. Migrants related experiences of isolation and loneliness which were difficult to overcome.

Resource theory related to family quality of life was supported as the participants in the study indicated that family cohesion had become exceptionally strong following the migration to another culture and was an important factor in providing for the emotional and physical needs that were not met by social support. Their common needs encouraged family members to tolerate more than they would have in more secure circumstances and to attempt to assist other family members in their adaptation. When a family migrates to a new culture they are faced with a multitude of tasks that require establishing new boundaries, developing problem solving methods for the difficulties encountered and creating a new identity. The migration forces the development of new patterns of communication and routines to which the family must adapt in order to survive. Their quality of life after migration greatly depends on their ability to successfully overcome these challenges.

This study was conducted in a rapidly developing South American country with a large number of first and second generation immigrants. The variety of study participants from numerous countries around the world provides an opportunity to investigate commonalities among migrants. The study is an effort to gain knowledge through the use of qualitative research that will be building blocks in our understanding of migrant QoL. There is a great need in the social sciences to continue the expansion of research studies to areas outside the United States and Europe in order to gain a global picture of the human experience.

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