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TESTING MASLOW'S HIERARCHY OF NEEDS: NATIONAL QUALITY-OF-LIFE ACROSS TIME

ABSTRACT. Maslow's hierarchy-of-needs theory is used to predict development of Quality of Life (QOL) in countries over time. Previous data sets have not had sufficient power to test these development trends among countries. Therefore a new database was developed that includes annual quality of life time-series for 88 countries from 1960 to 1994, covering measures on all five of Maslow's need-levels. Results showed significant agreement with some of Maslow's predictions, including his sequence of need achievement, and parts of an S-shaped trajectory in QOL. However, his mechanism of growth – that countries must slow growth in one area to increase growth in another – was disconfirmed.

INTRODUCTION

The ruling party of China believes that a nation's "more basic needs" must be met before democracy can be successfully established. In contrast, Russia was advised by the U.S. to establish democracy at once, regardless of peoples' other needs. Which policy will increase their citizens' QOL most quickly? Maslow's "hierarchy of needs" theory addresses this type of question. In this paper, we test Maslow's predictions on the experiences of a large sample of countries across 35 years.

Maslow's (1970) hierarchical theory of human motivation is included in every text in introductory psychology. It has received moderate experimental support (Wicker et al., 1993) in predicting how *individuals* develop. Sirgy (1986) has suggested that it can also describe how *nations* develop and improve their quality of life. Maslow classifies all of human striving as an attempt to fill one

of 5 needs. The first need he labels as physiological, such as air, water, and sufficient calories and nutrients to live. The second need is safety, such as safety from assault, from murder, and from chaos. The third need is belongingness and love, including friends, a family, a community, and "having roots". The fourth need is esteem, where a person is valued as a wise decision-maker, has a certain status and confidence. The fifth need is self-actualization, where each individual makes maximum use of his or her individual gifts and interests, "to become everything that one is capable of becoming" (p. 46).

Maslow arranges these 5 needs in a *hierarchy*, where their fulfillment follows a fixed sequence. The physiological needs are filled first. (When they are missing, almost all effort goes to filling these more basic needs.) Once these are nearing complete satisfaction, effort is allocated to the next level of the hierarchy – safety. Once safety is nearing satisfaction, effort is allocated to the next level, and so on for each of the higher needs. "The chief principle of organization in human motivational life is the arrangement of basic needs in a hierarchy of lesser or greater priority" (p. 59).

Maslow offers this as a theory of *individual* need fulfillment, but it is natural to inquire whether it can be extended to describe the need fulfillment of *nations*, as well. His theory has several implications that can be tested by observing nations' development through time. They are stated as 4 hypotheses that can be tested on time-series of nations' actual development over time.

H1. Nations will increasingly fill their needs over time. This is his simplest prediction. Maslow sees individuals as *learning* successfully over time, thereby fulfilling their lower-level needs and progressing on to higher-level needs.

H2. A nation's trajectory of need fulfillment will follow an S-shaped pattern over time. Figure 1 demonstrates this prediction, where need fulfillment is plotted as a function of time. The curve on the left shows predicted achievement trajectory for a lower-level need, and the curve on the right measures achievement of the next-higher-level need. As nations place effort into lower-level needs first, achievement of higher level needs will show little improvement (as shown in the right-hand curve from year 5 to year 10). But once
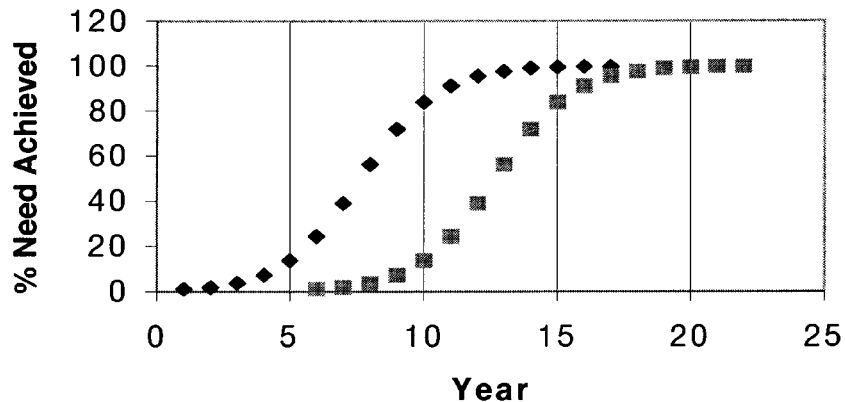
Figure 1. Hypothetical S-shaped curves predicting time path of fulfillment for two needs.

lower-level needs are nearing attainment, they will place more effort into the next need-level, causing a much higher slope on the growth trajectory (see the right-hand curve from year 10–15.) Finally, as needs at this level approach fulfillment, effort is allocated away to the third-level needs, causing lowered growth again (right-hand curve from year 15–20). This produces two "kinks" in each curve, which should be observable as an S-shape.

H3. Nations' *sequence* of need fulfillment will follow Maslow's sequence, from physiological needs, to security, to belonginess, to esteem, to actualization. This sequence is his most publicized prediction, but it has not been tested for nations' development of quality of life.

H4. Higher growth in one need area should be correlated with lower growth in other need areas for the same time period. This is because Maslow argues that effort can only be allocated to one need-level at a time. Figure 1 also shows this prediction, where growth in the right-hand curve is slower during years 5–10, while effort is expended on the more basic left-hand curve during the same period. In contrast, other theories might suggest that "synergies" could exist among levels: for example, improvements in health will also cause improvements in GDP at the same time.

Maslow's 5 needs allow the extension of traditional economic development theory to a broader measure of QOL. Traditional eco-

nomic development theory considers money-income as the quantity to be maximized in human endeavor. Education, poverty, and health are also considered, but primarily as "human capital" and as means to the end of increasing money and the things it can buy. In contrast, Maslow's theory allows non-economic quantities to be valid measures of QOL. For example, many people in developed countries now consider "belongingness" and a sense of community to be important elements of QOL. Yet traditional economic development is silent on these. The present paper introduces some first measures of Maslow's higher needs, such as "belongingness".

Previous Research

Sirgy (1986) was first to suggest that Maslow's theory could describe Quality of Life development among nations. However, testing the theory has not been possible until now because it requires a sufficiently long *time-series* of each country's progress on each need-level. In contrast, most previous research on nations' quality of life has been *cross-sectional*. For example, Diener's (1995) national QOL index covered a broad range of measures for 77 countries, but for only one time period – 1991. Similarly Veenhoven and Ehrhardt (1995) performed extensive analysis but used only cross-sectional data for the 1980's. Mazumdar (1995) and Majumder et al. (1995) developed the first time-series database of countries' QOL, but it included only 4 time periods – 1960, 1970, 1980, and 1990. While this covers a broad period of time, the data are very sparse. This severely limits the modeling that can be done on each country. For example, an S-shaped curve requires 4 data points just to estimate. Hence their data could not test the S-shape with any power.

The data set described here solves these problems by collecting annual measures over 35 years on each country. It also contains 12 variables directly aimed at measuring achievement on Maslow's hierarchy of 5 levels. It provides the best database yet to test Maslow's theory of QOL development.

DATA

Table I shows the 12 indicators collected in the database, grouped by Maslow's need hierarchy. The first row lists the physiological

TABLE I

Maslow's hierarchy of needs, with measures of a country's status on each need

Maslow's Need Hierarchy	Measures for a Country
1. Physiological	Daily calories available per person
	GDP per person
2. Safety	Safety from War (1-War Rate)
	Safety from Murder (1-Homicide Rate)
	High Life Expectancy
3. Belongingness and Love	Low Divorce Rate (1-Divorce Rate)
	Low Child Death Rate (1-Infant Mortality Rate)
4. Esteem	Political Rights
	Women's participation in work for pay
5. Self-Actualization	Tertiary Education Enrollment
	Secondary Education Enrollment
	Primary Education Enrollment (?)

needs, measured by daily calories available per person, and gross domestic product per person (GDP/person). Daily calories available per person were from the Food and Agriculture Organization (1995) database. They defined daily calories as the caloric equivalent of all food in the country over a year, after accounting for imports and exports, subtracting food used for seed or for animal feed. They point out that this measure has the shortcoming that it cannot account for inequitable distribution, or for differences in consumer tastes. GDP per person was collected from the World Bank (1997). GDP was measured in constant 1987 US dollars, and divided by midyear population estimates for each year.

Safety needs were measured by safety from war, safety from murder, and by total life expectancy in the country. Safety from war was calculated as one minus the probability of dying from war or rebellion in that year. Deaths from wars for each country were computed from Eckhardt (1989), and supplemented by SIPRI (1995). Deaths from war included not only military deaths, but deaths of civilians, and not only international wars, but also civil wars. All

conflicts were recorded that resulted in total deaths of more than 1000 people. Total deaths were converted to average deaths per year from each conflict, divided by midyear population of each country. Homicide rate was collected from Bennett's (1991) Correlates of Crime database, and supplemented by Interpol reports of intentional homicides for all reporting countries. Life Expectancy was collected from the World Bank and supplemented by the annual UN Statistical Yearbook. Note that Life Expectancy is logically inclusive of both deaths from war and homicides. But we include them because people perceive war and crime as far more threatening and chaotic than death from disease.

Measures of "belongingness" and love were related to the risk of a "broken family" – the risk of divorce, as well as the risk of a child in the family dying. Many parents report that the death of their child is the greatest suffering a parent can endure. Similarly, divorce causes great stress and suffering for the entire family. Divorce rate per thousand population and infant mortality per thousand live births were recorded from the annual UN Demographic Yearbook.

Measures of esteem were political freedom and women's participation in the work force. Davies (1991) suggested both of these as measures of Maslow's fourth-level needs. Political freedom was collected from the Polity III database of Jaggers and Gurr (1995). These political scientists provide expert ratings of the degree of democracy enjoyed by each country for each year, based on government and media reports. Women's work force participation attempts to measure whether women have equal opportunity to compete with men. The World Bank provided data on the percent of the workforce that is female, where workforce is defined as all people in a country paid money for their work.

Finally, self-actualization was measured as access to higher education. Sirgy (1986) suggested that *higher* education encourages creativity and knowledge-generation. In contrast, he suggests that primary education is oriented toward skills-training and satisfying more basic needs. Therefore, we place a question mark in Table I after the primary education entry, to denote that it may be associated with more basic need levels. We will test Sirgy's distinction by examining three levels of education: primary, secondary, and tertiary. The education measures are limited because they tap only

one type of creativity and self-actualization that Maslow cited. Other types of self-actualization are artistic expression, and religious expression. Unfortunately, we did not have data to test these other possible measures of self-actualization. Education data were collected from the annual UNESCO yearbook as the percent of eligible age groups enrolled in primary, secondary, and tertiary education.

Data were collected for a total of 88 countries from 1960 to 1994. The countries are listed in Appendix A. They were chosen to include the 77 reported by Diener (1995), and augmented to include formerly socialist countries in central Europe. Three countries split apart after 1990: USSR, Czechoslovakia, and Yugoslavia. For these countries, we followed the practice of the World Bank to designate a successor country to each. The successor country to the USSR is considered Russia. The successor country to Czechoslovakia is the Czech Republic, and the successor country to Yugoslavia is Slovenia. To ensure the consistency of the time-series, data prior to the splits were revised to reflect only the provinces representing the successor countries. Two countries merged after 1990: East and West Germany. Data for West Germany only were collected after 1990 to maintain consistency. The 88 countries account for 87% of the current world population. Countries were drawn from all strata of development as defined by the World Bank.

Some data was missing because not all countries reported to international agencies every year. Across all 12 measures and over all 35 years, 28% of the data was missing, equivalent to 1 out of every 4 years missing. The percent of missing data varied from 0% for safety from war, to 64% missing for homicide rate. As expected, more data was missing for less developed countries than for more developed. The analysis methods that were used ensured that countries with less data would be given the same weight as countries with more.

RESULTS

The four hypotheses were tested by observing the growth of each measure over time. Figures 2–13 plot the growth of the 12 measures over time, with the top curve of each figure representing the mean
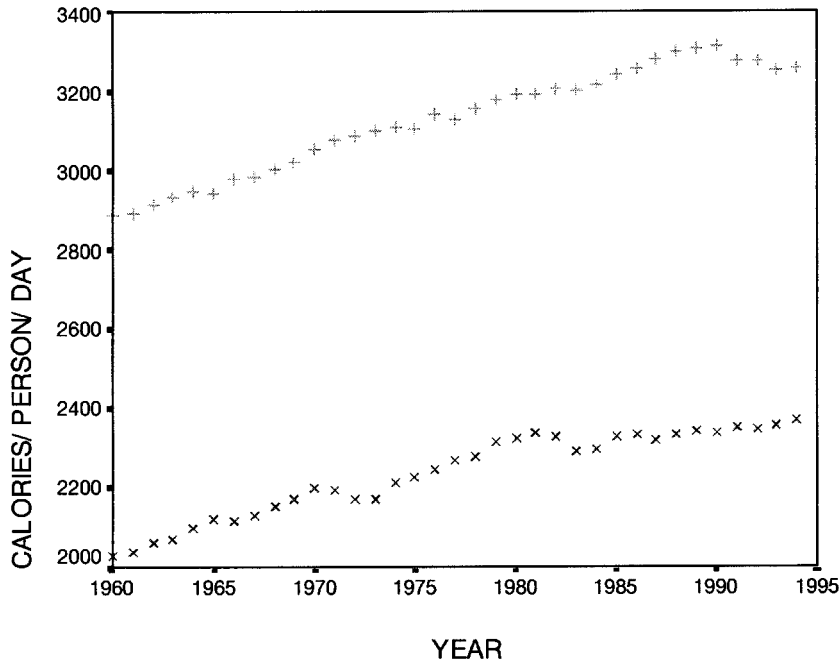
Figure 2. Calories per person per day since 1960, by top 50% (plotted as "+")
and bottom 50% (plotted as "x") of nations.

of the top 50% of nations on that measure, and the bottom curve
the bottom 50% of nations. Separate curves for top and bottom per-
formers are plotted because each might capture a different part of
the S-shaped pattern theorized in Figure 1. For example, Figure 2
contains the growth curves on calories per person. The top curve is
the average of the 44 nations that ranked in the top 50% on calories
per person (averaged over all years), and the bottom curve is the
average of the 44 nations that ranked in the bottom 50%. (For pur-
poses of plotting, any missing data for a country were interpolated
by a cubic polynomial regression to ensure that all countries are
represented in each point.) The figures appear quite orderly, with
only a few exceptions. For example, an outlier appears in Figure 4
for the year 1994. It was caused by Rwanda, where over 8% of its
citizens were killed by genocide in that year.

Hypothesis 1 was tested by examining the linear time trends for
each measure. A separate linear regression was run for each country,
predicting each measure from the number of years since 1960. The
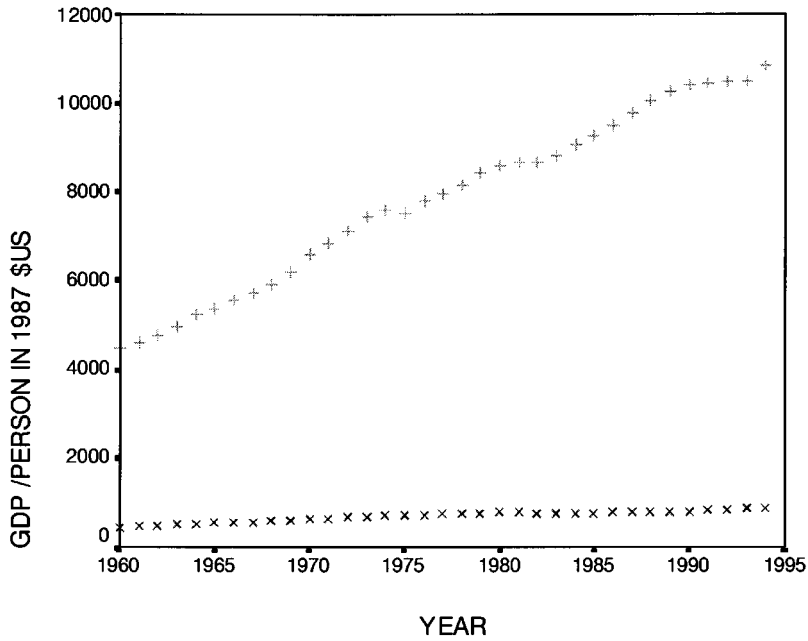regression coefficients are shown in Table II. Nine of the twelve

Figure 3. GDP per person, in 1987 US dollars, since 1960, by top 50% (plotted as "+") and bottom 50% (plotted as "x") of nations.
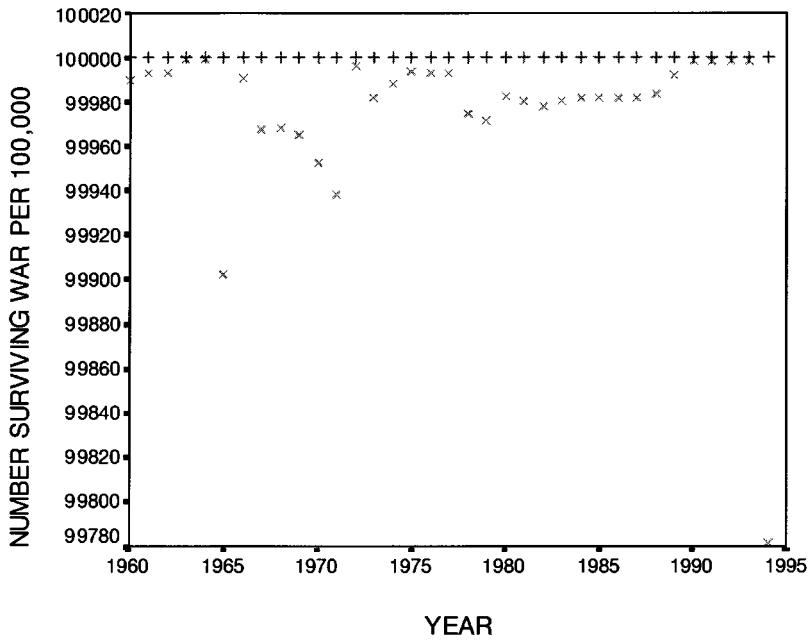

Figure 4. Probability of surviving war per 100,000 (1-War Rate) since 1960, by top 50% (plotted as "+") and bottom 50% (plotted as "x") of nations.

TABLE II

Mean change per year across countries for each measure (Standard errors are in parentheses.)

| Measure of Maslow Need	Mean change per year
Calories/person	10.8** calories/yr. (1.35)
GDP/person	95.10** US dollars/yr. (16.0)
1-War rate	–4.75 deaths/100,000 (8.1)
1-Homicide rate	–0.121 deaths/100,000 (0.085)
Life Expectancy	0.330** years of life/yr. (0.021)
1-Divorce rate	–2.85** divorces/1000/yr. (0.41)
1-Infant Mortality	1.56** deaths/1000/yr. (0.11)
Democracy rating	0.153** points/yr. (0.025)
% Females in paid workforce	0.366** %/yr. (0.033)
% Enrolled in primary education	0.698** %/yr. (0.070)
% Enrolled in secondary education	1.09** %/yr. (0.066)
% Enrolled in tertiary education	0.578** %/yr. (0.049)

$**p < 0.01$.
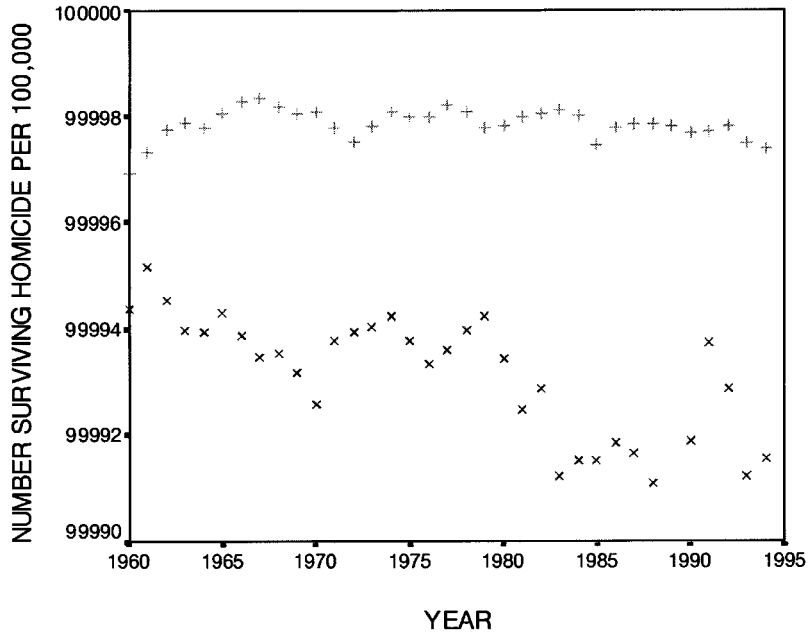
Figure 5. Probability of surviving homicide per 100,000 (1-Homicide Rate) since 1960, by top 50% (plotted as "+") and bottom 50% (plotted as "x") of nations.
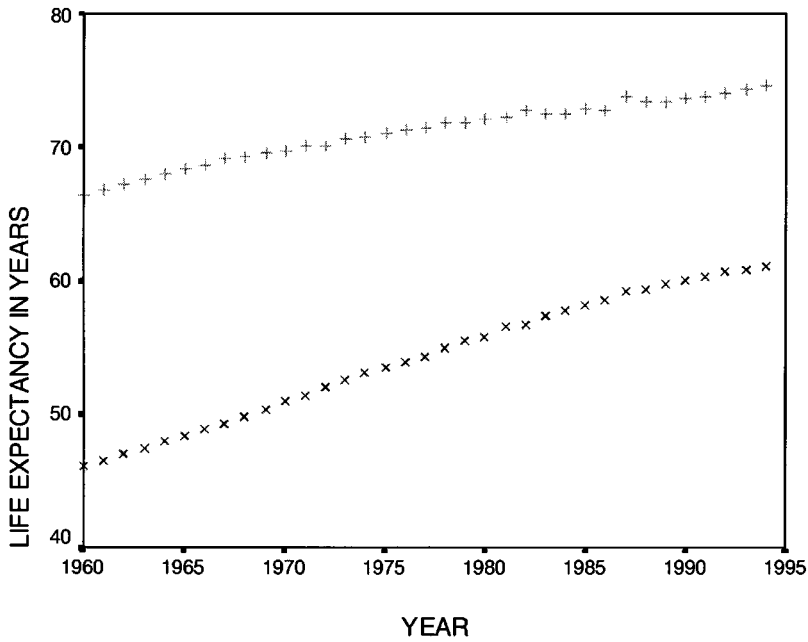

Figure 6. Life Expectancy (in years) since 1960, by top 50% (plotted as "+") and bottom 50% (plotted as "x") of nations.
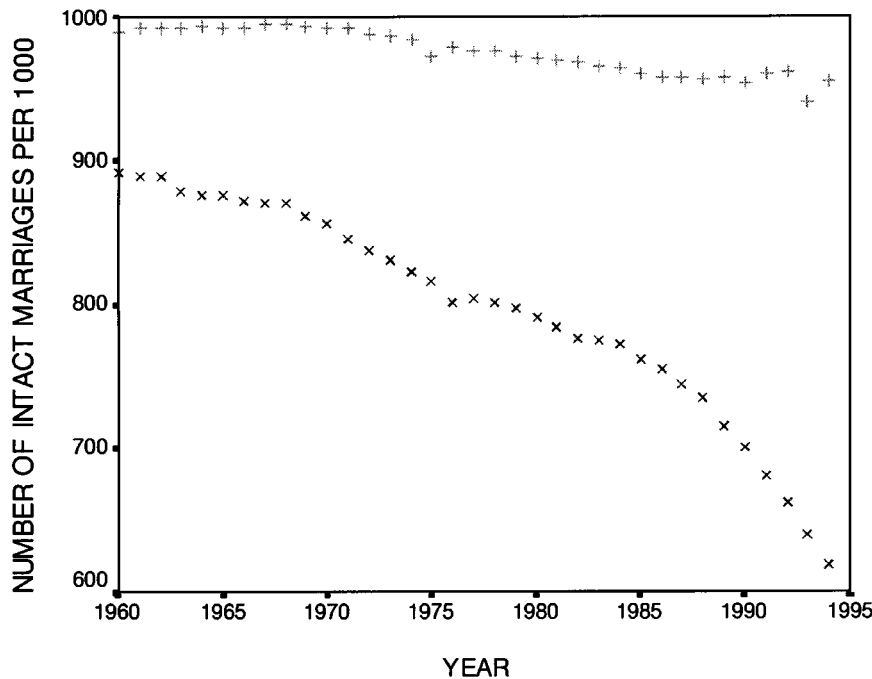
Figure 7. Number of intact marriages per 1000 population (1-Divorce Rate) since 1960, by top 50% (plotted as "+") and bottom 50% (plotted as "x") of nations.

are positive and significant, consistent with Maslow's predictions. Of the remaining 3, two were negative but not significant. Only "1-Divorce Rate" has been declining significantly over the last 35 years among these 88 countries. Hence H1 is largely confirmed. This is not to say that measures *never* decline for some period of time. Measures for individual countries often decline for some time, because of recessions, revolutions, famines, etc. Even the mean of *many* countries may decline for some time, as in the democracy ratings of Figure 9. It shows that the lowest 50% of nations dropped even lower on democracy during the 1970's, then began a climb that ended in the 1990's with their highest ratings yet. Maslow predicted only that the general *trend* would be upward as individuals met new challenges and learned to overcome them.

Hypothesis 2 was tested by examining the growth trajectories for each country for conformance to the S-shaped curves in Figure 1. Ideal evidence for Maslow's theory would be for each figure to display the S-shape pattern, with the early years showing accelerating
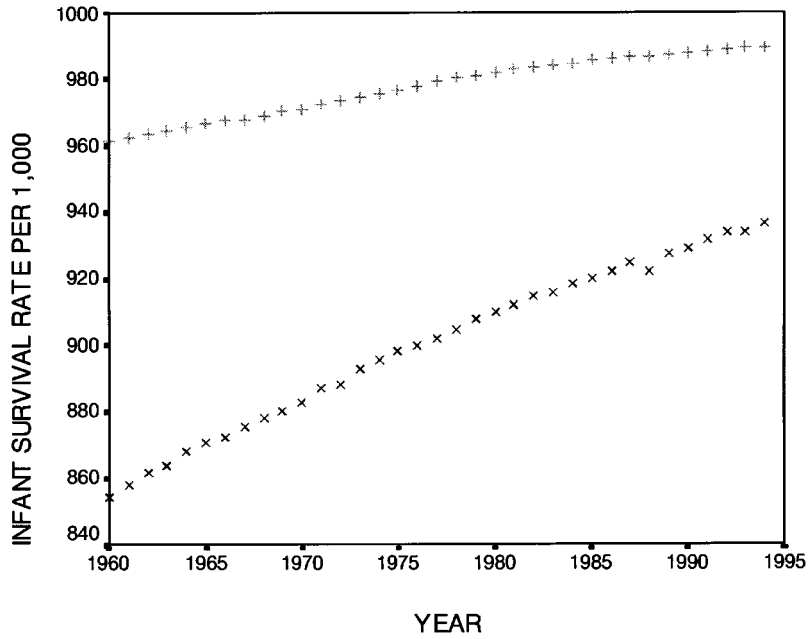
Figure 8. Infant survival rates per 1000 (1-Infant Mortality) since 1960, by top 50% (plotted as "+") and bottom 50% (plotted as "x") of nations.
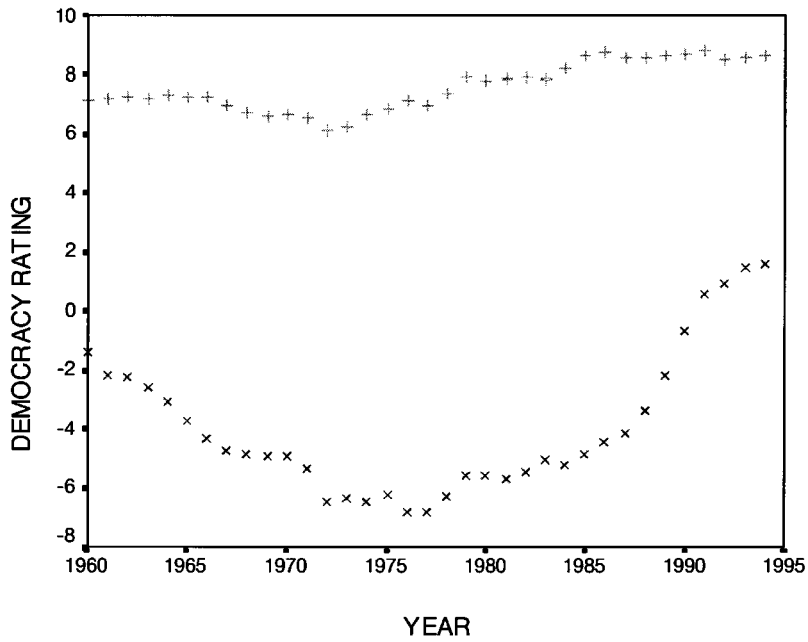

Figure 9. Ratings of democracy since 1960, by top 50% (plotted as "+") and bottom 50% (plotted as "x") of nations.

TABLE III

Quadratic regression coefficients for top and bottom countries on each measure (Standard errors are in parentheses.)

Measure	Mean coefficient for top 50% of countries		Mean coefficient for bottom 50% of countries	
Calories/person	–0.207*	(0.088)	–0.261**	(0.076)
GDP/person	–2.65	(1.79)	–0.298*	(0.129)
1-War Rate	0		–7.8E-7	(7.7E-7)
1-Homicide Rate	–1.1E-6	(3E-6)	–2.E-6**	(6.4E-7)
Life Expectancy	–0.001	(0.002)	–0.0076	(0.006)
1- Divorce Rate	0.136**	(0.029)	0.082**	(0.020)
1-Infant Mortality	0.025	(0.016)	–0.014**	(0.004)
Democracy rating	0.0025	(0.0013)	0.21**	(0.001)
% Females in paid workforce	–0.0064**	(0.002)	–0.0065**	(0.003)
% Enrolled in primary education	–0.041**	(0.004)	–0.034**	(0.008)
% Enrolled in secondary education	–0.006	(0.007)	0.0018	(0.005)
% Enrolled in tertiary education	0.0054	(0.004)	0.0026	(0.003)

$*p < 0.05$.
$**p < 0.01$.

growth, and the later years showing growth decelerating toward an asymptote. Further, the bottom curve should be accelerating more than the top curve, since the nations in the bottom curve are farther from satiation on that measure. Instead, none of the 24 curves has a strong S-shape. However, many display the *top* part of the S (growth is decelerating toward an asymptote).

To quantify these observations, a third degree polynomial regression was estimated, where the 3 predictor variables were the cube, the square, and the first power of the number of years since 1960. None of the 24 regressions yielded a significant improvement when the cubic term was added. This is consistent with visual inspection that no full S-shapes appear. However, many regressions showed significant improvement when the *square* of the year was added. This indicates that curves from the top or bottom half of the S-shape are present. Table III shows these quadratic coefficients. Of the 12 ×
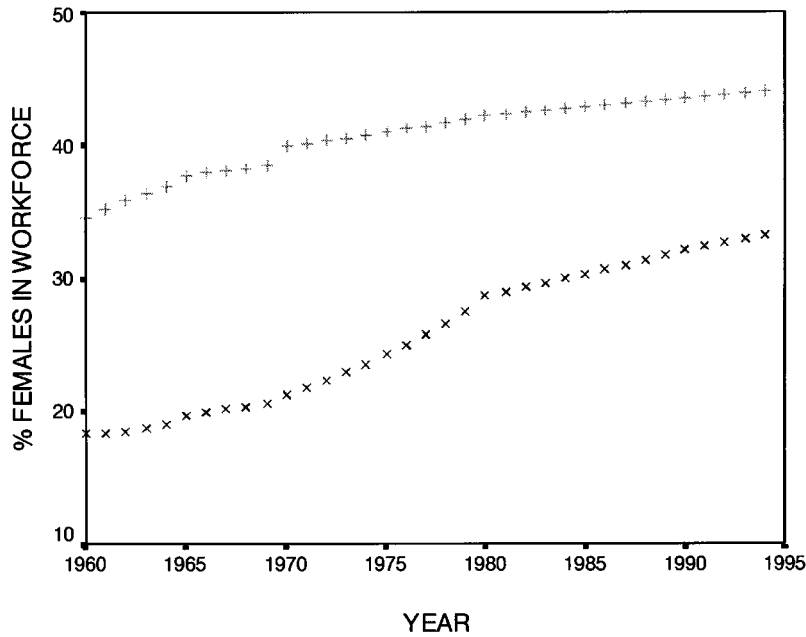
Figure 10. Percent of the paid workforce that is female since 1960, by top 50% (plotted as "+") and bottom 50% (plotted as "x") of nations.

2 = 24 curves in the figures, the quadratic trend was significant in 12, or half. Of these, 10 had negative signs. The negative sign is consistent with the top part of the S-curve, showing growth decelerating toward an asymptote. In addition, one curve had already reached asymptote – the top 50% of countries on "1-War Rate" had achieved no deaths from war since 1960. Hence its curvature was zero, but consistent with Maslow's theory. The only significant positive signs were for divorce, which is already an outlier because it is the only significantly declining measure.

Hypothesis 3 was tested by locating the year that each country grew fastest on each measure. The S-shaped curve was estimated for each country for each measure separately, using a cubic polynomial regression equation. Each fitted measure can then be compared to the other 11 measures, to find when each S-shape achieves its fastest growth and (in theory) when it achieves asymptote, similar to the two curves in Figure 1. If Maslow's theory fits the data, then his sequence should predict the actual sequence of need achievement of nations, with Physiological needs achieved first, then Safety, etc.

TABLE IV

Timeline showing year of fastest growth for each of 12 needs measures

Measure	Actual Year that Measure achieved fastest growth	Sequence Predicted by Maslow
Primary Education	1966.4	?
GDP per person	1973.7	1
1-War	1974.0	2
Calories per person	1974.1	1
Life Expectancy	1975.8	2
1-Divorce	1976.2	3
Secondary Education	1976.9	5
Female Workforce Part.	1977.2	4
Tertiary Education	1981.5	5
1-Homicide	1980.0	2
1-Infant Mortality	1983.5	3
Democracy	1985.7	4

Table IV presents the year of fastest growth from the best-fitting S-curve for each measure, averaged over all countries. The top row shows that of the 12 measures, primary education enrollment was the first to achieve its fastest growth. The year of fastest growth was 1966.4, averaged over the 88 countries. The next row shows the measure that achieved its fastest growth next – GDP/person, in 1973.7. The actual sequence displayed by the 12 measues can be compared with Maslow's predicted sequence, shown in the last column. Spearman's rho shows that the two columns are highly correlated (rho $= 0.69$, $p < 0.02$), consistent with Maslow's predictions.

The three measures of education show some of the largest deviations between predicted and actual. Consistent with Sirgy's suggestion, primary education seems to occur early in development, reflecting it's ability to fulfill more basic needs. Secondary education occurs near the middle, while tertiary occurs later yet. Based on their observed sequences, it seems that only tertiary education is appropriate as a measure of self-actualization.
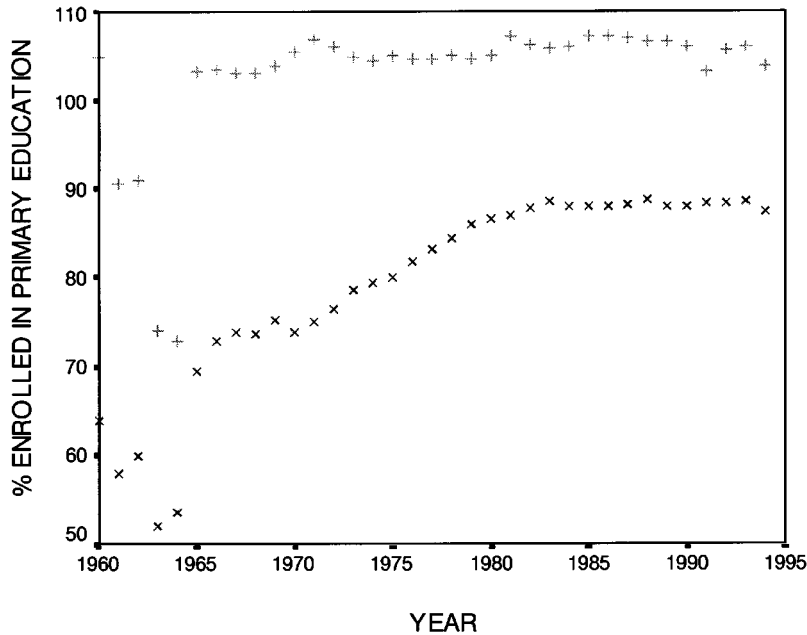
Figure 11. Percent of eligible age group that is enrolled in primary education since 1960, by top 50% (plotted as "+") and bottom 50% (plotted as "x") of nations.

Hypothesis 4 was tested by computing correlations among the growth measures. Annual changes were computed for each nation for each year, then normalized by the nations's score on that measure for that year. This yielded a "percent change score", Δ, for each nation and measure that was comparable across nations: $\Delta = (m_{it} - m_{it-1})/m_{it}$.

These "percent change scores" were then correlated with percent change scores on the other measures, and the results shown in Table V. Each correlation was computed from 88 nations × 34 years = 2992 observations (when no observations were missing). Maslow's theory predicts that all correlations across measures be significant and negative, as Figure 1 demonstrates. Instead, only 9 of the 66 possible correlations were significant, and 7 of these were positive, contrary to Maslow's predictions. Table V shows that an increase in calories is associated with an increase in GDP/person, an increase in safety from war, and an increase in female participation in the work force. GDP/person is also associated with increases in safety from war and female participation. Improvements in infant

TABLE V

Correlations among percent change scores for the 12 measures of Maslow's theory

| Measure	1	2	3	4	5	6	7	8	9	10	11	12
Calories/person (1)	1.00											
GDP/person (2)	0.29*	1.00										
1-War rate (3)	0.10*	0.28*	1.00									
1-Homicide rate (4)	0.02	0.03	–0.05	1.00								
Life Expectancy (5)	0.06	0.05	–0.02	0.00	1.00							
1- Divorce rate (6)	–0.03	–0.01	0.00	0.01	0.01	1.00						
1-Infant Mortality (7)	–0.01	0.03	–0.01	0.05	0.17*	0.01	1.00					
Democracy rating (8)	–0.02	–0.03	0.00	0.00	–0.07	0.00	0.00	1.00				
% Females in paid workforce (9)	0.05*	0.06*	0.00	–0.02	0.05	0.01	0.09*	0.01	1.00			
% Enrolled in primary education (10)	0.03	0.04	0.04	0.03	0.00	0.02	–0.03	0.05	–0.06*	1.00		
% Enrolled in secondary education (11)	0.02	0.03	0.01	0.02	0.05	–0.01	0.01	0.02	–0.01	–0.16*	1.00	
% Enrolled in tertiary education (12)	–0.01	–0.05	0.01	0.01	–0.01	0.02	–0.03	0.00	0.01	0.01	–0.01	1.00

*$p < 0.05$.
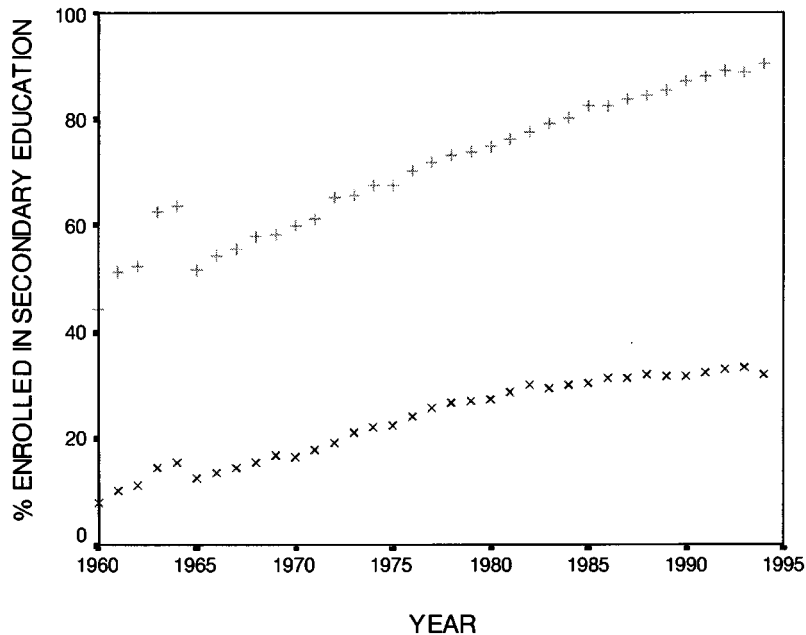
Figure 12. Percent of eligible age group that is enrolled in secondary education since 1960, by top 50% (plotted as "+") and bottom 50% (plotted as "x") of nations.

mortality are associated with improvements in life-expectancy and in female participation (though the former is probably due to the fact that infant mortality is part of the calculation of life-expectancy). Finally, improving female participation is associated with *declining* primary school attendance for eligible children, which itself is associated with *improving* secondary school attendance. Overall, H4 is strongly rejected.

DISCUSSION

A large time-series database was created to test whether Maslow's hierarchy-of-needs theory could predict the development of Quality of Life in countries over time. The database is uniquely suited to testing theories of development, because it contains a 35-year time series of 88 countries, capturing measures of not just economic variables, but of family life, esteem, and self-actualization. Results confirm some parts of Maslow's theory. In particular, the time trajectories for most measures show significant increases over the last
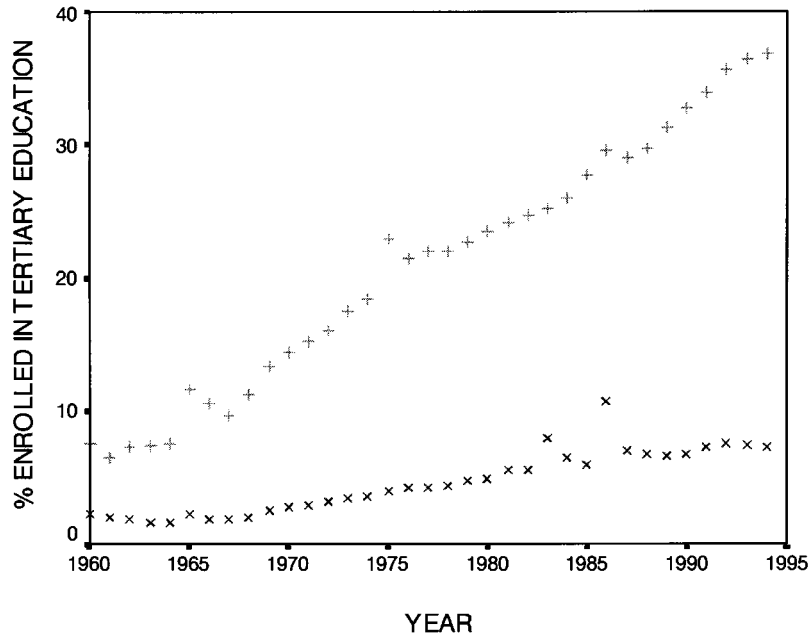
Figure 13.   Percent of eligible age group that is enrolled in tertiary education since 1960, by top 50% (plotted as "+") and bottom 50% (plotted as "x") of nations.

35 years (with the exception that divorce rates are getting worse). The shape of the trajectories is not the full S-shape predicted by Maslow, but many display the top part of the S, indicating the rate of growth is slowing toward an asymptote on these measures. Finally, the *sequence* of actual need fulfillment is significantly correlated with Maslow's hierarchical predictions. However, the mechanism of growth suggested by Maslow, by which growth in one need area must slow when the country focuses on growth in another need area, is disconfirmed. Instead, growth in one need area tends to be positively, not negatively, correlated with growth in other need areas in the same year.

This research can then give a partial answer to the question raised at the beginning of this paper on whether basic needs must be met first before democracy is introduced. Table IV shows that fastest growth in democracy occurs an average of 12 years *after* the fastest growth in GDP/person, consistent with the beliefs of China's ruling party, and contrary to the advice given to Russia. However we must point out the limitations of this first study – that correlation does not

imply causation, and that the average relationships we have found may be moderated by other variables, such as previous history of democratic traditions, level of wealth, etc. Future research would help clarify these questions.

Maslow's theory also has a shortcoming when applied to nations' QOL – it fails to consider conditions *outside* the individual, such as environmental health, poverty in minority groups, etc. In contrast, Diener (1995) provides a comprehensive list of QOL indicators, based on shared values from many cultures. It would be helpful to collect time trends for his additional values to see whether they obey the same regularities found for the 12 measures of QOL examined here.

APPENDIX A: LIST OF 88 NATIONS SAMPLED

Algeria	Honduras	Philippines
Argentina	Hong Kong	Poland
Australia	Hungary	Portugal
Austria	Iceland	Romania
Bangladesh	India	Russian
Belgium	Indonesia	Rwanda
Benin	Iran	Senegal
Bolivia	Ireland	Sierra Leone
Brazil	Israel	Singapore
Bulgaria	Italy	Slovak Republic
Cameroon	Japan	Slovenia
Canada	Jordan	South Africa
Chile	Kenya	Spain
China	Korea, Republic	Sri Lanka
Colombia	Luxembourg	Sweden
Costa Rica	Madagascar	Switzerland
Cote d'Ivoire	Malaysia	Syria
Czech Re	Mauritius	Tanzania
Denmark	Mexico	Thailand
Dominica	Morocco	Togo
Ecuador	Netherlands	Tunisia

Egypt	New Zealand	Turkey
El Salvador	Nicaragua	United Kingdom
Ethiopia	Nigeria	United States
Finland	Norway	Uruguay
France	Pakistan	Venezuela
Germany	Panama	Zambia
Ghana	Papua New Guinea	Zimbabwe
Greece	Paraguay	
Guatemala	Peru	

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