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The Political Impact of Quality of Life

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Under the Direction of Sean Richey

ABSTRACT

Scholars of economics, sociology, political science, and social psychology have attempted to define and quantify quality of life in order to make meaningful observations of society and to formulate optimal policy prescriptions. Unfortunately few if any of these attempts have systematically measured or used quality of life in a quantitative evaluation of data. In what follows I develop an empirically valid metric for measuring quality of life, establish the role of quality of life in determining societal and political outcomes, and explore what predicts higher quality of life to provide insight to about how quality of life can be improved.

INDEX WORDS: Quality of life, Political behavior, Voter turnout, Direct democracy, Taxation, FAADS, Index

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CHAPTER 1: Understanding Quality of Life

The initial impetus behind this project was a desire to better understand the relationship between publicly owned lands and rural communities. Recent reports, such as the one done by the Sonoran Institute (2006), claims that there are numerous positive impacts that flow from the presence and preservation of public lands. They claim that public lands can positively impact the well being of citizens both economically (p. 6) and in non-quantifiable ways (p. 11). I found this claim intriguing, and one that warranted a more in-depth examination.

In examining the differences between the rural counties with public lands and those without public lands, I first felt that I needed to explore the differences between these two areas. Once I could establish that there is a difference between these two types of areas, I could consider whether the public lands were the casual link or the driving force behind this distinction. In order to test and verify these claims there must be a way to examine the quality of life in these two types of areas. Before I could measure the quality of life, I felt that a more complete understanding of the concepts of life quality and its measurement was needed.

This exploration led me to one of the central research questions, how to measure life quality. I wished to explore the definition of quality of life and its measurement. I found that the concept of life quality and its measurement has been discussed and debated among scholars of various fields for many years, and while there are a variety of positions advocated by various disciplines, there appears to be an emerging consensus regarding its importance, but not its measurement.

Despite the importance of consistent and uniform measurement, the value of measuring quality of life comes not from a novel approach to that measurement but from how a measure of

quality of life can be used to better explain the phenomenon in the real world, particularly political phenomenon.

Thus I proceed in two parts, in the first part I explore quality of life conceptually, develop and validate an index that measure life quality, and discuss how that measure might be used to explore political and social outcomes. In the second part, I explore the mechanism by which life quality might affect those outcomes. I first lay out theory that suggests how quality of life might impact political outcomes and then present empirical studies of trust, ballot measures, tax decisions. Finally I turn to how quality of life might be affected by the political process particularly though the expenditure of governmental funds. By proceeding in this manner I explore life quality both as a measure and as an important variable in a variety of settings of interest to the political scientist.

Scholarly Work on Quality of Life

Scholars of economics, sociology, political science and social psychology have all attempted to define and effectively quantify their definitions of Quality of Life in order to make meaningful observations of society and to formulate optimal policy prescriptions. Milbrath (1979) states that quality of life information is a useful policymaking tool because it can: "identify predicaments, provide value weightings, infer prospective project impacts, assess project outcomes…suggest alternate lifestyles, (and) alert leaders to growing disaffection" (p. 32). Campbell (1981) quotes President Lyndon B. Johnson as saying:

> The task of the Great Society is to ensure the people the environment, the capacities, and the social structures which will give them a meaningful chance to pursue their individual happiness. Thus the Great Society is concerned not with how much, but with how good-not with the quantity of goods, but with the quality of our lives (p. 4).

I agree with this assessment of the potential applications of a consistent Quality of Life measure and this study constructs just such a measure.

The vast literature on quality of life touches many areas of interest; unfortunately most of it has failed to connect the overlapping indicators and methods from the various fields with each other, to achieve a consensus on the definition of quality of life and how to measure it. As part of this literature review, I examined many of the past indexes that had been created by other researchers. Each researcher found distinct aspects to include in the index, often based on what the research had intended to study. I examined the indicators that each study used and found many similarities.

Lambiri, Biagi, and Royuela (2006), compiled most of the significant studies and analyzed their similarities. According to Lambiri et al. (2006), the indicators can be formed into six different classifications:

> natural environment (climate, state of natural environment, etc.), built environment (type and state of building, etc.), socio-political environment (community life, political participation, etc.), local economic environment (local income, unemployment, etc.), cultural and leisure environment (museums, restaurants, etc.), public policy environment (safety, health care, education provision, etc.) (pg. 9).

I found these distinctions useful in examining what the different studies used to measure the quality of life. Using this classification system as a model, I chose to examine other indexes based on how well they fit with my own index. I formed five classifications: public safety, heath, infrastructure, education, economic environment, and other (anything included in the index that did not fit within the other four categories).

Public Safety

In many of the quality of life indicators I observed that most public safety measures included some element regarding crime. Most found some way of representing the amount of violent crime in the area: Graves (1976) used the number of violent crimes per 100,000; Rosen (1979) simply uses the total crime rate; Blomquist, Berger, and Hoehn (1988), Ceshire and Hay (1989), Stover and Leven (1992), Ready, Burger, and Blomquist (1997), Nzaku and Bukenya (2005) (even though they place this measure in an "amenities" category), and Shapiro (2006) all use a measure of violent crime in the area to measure public safety.

A few studies use indicators that are not as simplistically defined. In fact, in one very complicated example, Henderson, Lickerman, and Flynn (2000) create a variable to represent determinants of public safety and outcomes. For determinants they include risk-taking, alcohol use, protection, training, laws, product design, financial incentives, and natural phenomena and cultural values. For outcomes they use vehicles, firearms, poisonings, falls, acute illness, and chronic illness to represent public safety (Henderson et al., 2000). Gyourko and Tracy (1991) use a measure (though again, they place it inside another variable, this time as part of their fiscal measurement) of government services: police services, per capita incidence of violent crime, and fire insurance company local premium. *The Economist* (2005) uses a measure of political stability and security to measure the public safety between countries in their index.

Overall, there are a few indexes whose variables are a complex combination of many aspects of a certain place. Most indexes, however, simply include some measure of the frequency of crime, generally specified to be violent crime, as the standard of measurement for public safety of an area.

Health

The measure for health in quality of life indexes was less uniform than the public safety measurement. Eleven of the indexes examined did not even include a variable that captured the effects of a health index. Although a common theme was to use mortality rates or life expectancy, this is certainly not the only way that researchers chose to examine this element of quality of life.

Henderson et al. (2000) chose to use a composite that includes the infant mortality rate, the life expectancy rate, and self-reported health. *The Economist* (2005) uses the life expectancy at birth, in years, for the health indicator. While Suffian and Jafar (1993) simply use the infant mortality rate. Agostini and Richardson (1997) combine infant mortality, child mortality, and maternal mortality to measure public health.

Other, more unique forms of quantifying the health of an area are employed: Graves (1976) measures the number of physicians per 100,000 people; Gyouurko and Tracy (1991) use the number of hospital beds per 1,000 people; Nzaku and Bukenya (2005) count the number of non-federal physicians (although this is more intended to measure an economic environment, as it is part of the labor market factors variable). Schmidt and Courant (2006) use a composite variable comprised of number of hospital beds, number of hospital services provided, and a per capita measure of general/family practitioners, medical specialists, and surgical specialists.

Infrastructure

There was not a large consensus through the literature of what a viable form of representation can be attributed to infrastructure. In general, the indexes attempt to quantify this

by examining three things: population characteristics, available utilities, and housing characteristics.

Both Rosen (1979) and Roback (1982) examine the population size, and the population density, but uniquely include central city population and population growth rate, respectively. While Nzaku and Bukenya (2005) use a composite that includes population density with age of the population, non-white population, owner-occupied housing, per capita tax rate, distance to metro area, and road density. Still other indexes include a measure of the available facilities for the treatment of water, sewage, or landfills (Blomquist et al., 1988; Stover & Leven, 1992; Ready, Burger, & Blomquist, 1997; Henderson, Lickerman, & Flynn, 2000).

Other measures include the average number of persons per room in housing, the percentage of housing with electricity, and the number of telephones per 100 people (Sufian, 1993). Others similarly examine housing to determine this variable: number of rooms, number of bathrooms, and age of housing (Giannias, 1999). Calvert and Hendersen included a variety of other factors in their variable as well: transportation (including highways, railroads, air and transit, and waterways), communications (telephone, radio, and post), utilities (electric, gas, water, sewer, and disposal), and health safety and education (schools, hospitals, fire and police, and conservation and parks (Henderson et al., 2000).

Education

Roughly half of the indexes that I examined included some measure of educational quality. The most common way to represent this was including a measure of the ratio of students to teachers (Blomquist et al., 1988; Gyuurko & Tracy, 1991; Stover & Leven, 1991; 1992; Ready, Burger, & Blomquist, 1997). Other studies include input-based measurements like cost-

adjusted per pupil, and library circulation in number of books (Schmidt, 2006). Others look at outputs of education: percent of children in secondary school (Sufian, 1993), or mean year of schooling, number of 16-year-olds enrolled in school, and college and post-college graduates (Agostini & Richardson, 1997). Calvert and Henderson created a composite variable made of educational attainment levels, educational expenditures, literacy rates, access to education, distribution, segregation, discrimination, lifelong learning, and alternative education (Henderson et al., 2000).

Economic Environment

This variable quantifies the state of the economic environment within the area. Most indexes use different indicators to attempt to capture this. *The Economist* (2005) used GDP per person and percent unemployment; Roback (1982) uses the unemployment rate, as does Rosen (1979) although Rosen includes population growth as part of the index. In contrast, Agostini and Richardson (1997) capture the economic environment using the real per capita income.

Other indicators use less conventional methods of capturing the nature of the economic environment. Sufian (1993) measures the percent of income that is spent on food, while Nazuka and Bukenya (2005) use a composite measure including metropolitan influence, net migration, jobs in agriculture, jobs in manufacturing, and jobs in service sector. Schmidt and Courant (2006) measure the percent living below the poverty line. Calvert and Henderson comprise their indicators from two composite variables: the income model, made of demographics, stocks, housing, pensions, hours of paid work, hourly wages, hourly benefits, capital income, government transfers, other income, and the employment model, including the number of people in the labor force and the number of people not in the labor force (Henderson et al., 2000).

Other Indicators

Although many of the indexes examined had variables that fit well within these categories, there were usually a few that did not. Some used a variety of different indicators, but there were a few similar indicators that repeatedly showed throughout the literature. One of the most prevalent indicators was weather and environment in general. Many indexes examined the amount of pollution, the type of weather, the location, or other positive aspects of the natural environment. Table 1.1 below shows the use of the weather among the indexes:

Table 1.1

Inclusion of Weather

Study (Year)	**Weather/Environment Variable(s)**
Graves (1976)	*Weather*: average temperature *Pollution*: Average number of suspended particulates per m^3 of air
Rosen (1979)	*Climate*: number of rainy days, number of sunny days, number of 90 degree days *Pollution:* suspended particulates, sulphur dioxide, inversion days, water pollution
Roback (1982)	*Environment:* total suspended particulates *Location dummies:* northeast, south, west
Blomquist et al. (1988)	*Weather:* precipitation (inches p.a.), percent humidity, heating degree days, cooling degree days, wind speed (miles per hour), and sunshine days *Location:* distance from a coast/lake *Environment:* total suspended particulates (mg per m^3), and visibility in miles
Cheshire, & Hay (1989)	-Area of green space -Atmospheric and water pollution
Stover, & Leven (1992)	-Central city -Visibility -Precipitation -Humidity -Heating degree days and cooling degree days -Wind speed -Sunshine -Coast -Total suspended particulates
Sufian	*"Peace and quiet":* noise levels

(1993)	*Traffic flow:* mile per hour in rush hour
Ready, Burger, & Blomquist (1997)	-Visibility in miles -Total suspended particulates -Precipitation -Humidity -Heating degree days per year -Cooling degree days per year -Wind speed in miles per hour - average -Sunshine - percent of days -Coast – yes or no
Giannias (1998)	-Mean of the annual temperature -Number of cloudy days -Average number of suspended particulates per m^3 of air
Florida (2002)	-Number of hot and cold days -Seasonal temperature variation -Heating and cooling days -Freezing days -0 degree F days and 90 degree F days
Glaeser et al. (2001)	-Temperature -How dry of a climate -Proximity to ocean coast
Shapiro (2006)	-Number of days with an Air Quality Index > 100
Schmidt, & Courant (2006)	-Surface water index -Percent state recreation area -Days w/unhealthy air quality index -Average climate index
Cheshire and Magrini (2006)	-Ratio of wet day between FUR and national average -Ratio of ground frost frequency between FUR and national average -Maximum temperature percentage differences between FUR and national average -Ratio of cloud cover days between FUR and national averages -Ratio of minimum temperature between FUR and national averages -Ratio of mean temperature between FUR and national average -Ratio of the maximum temperature between FUR and the national average

Many indexes also included other factors beside weather and natural environment. Many tried to capture a social environment. Shapiro (2006) measured the number of restaurants in an area, or the number of professional sports teams in the city area as Giannias (1999). Florida (2002) attempts to measure the many unconventional aspects of an area, including the

homosexual population, the number of bars and nightclubs, the amount of nonprofit art museums and galleries, and the number of public golf courses among a host of other factors.

These factors which seek to extend the explanation of quality life beyond my five included indexes, and the natural environment (see Appendix One) are not included in my metric as they are not consistently included across studies of quality of life.

The Objective vs. the Subjective Debate

One of the central debates in the literature revolves around whether the indicators used to measure quality of life are "subjective" or "objective" in nature. Objective measures are based on aggregate population data have been advocated by such measures as the United Nations Development Program (2008) in their Human Development Index, and The World Bank (2009) in their World Development Indicators. Measures such as life expectancy, adult literacy rates, student enrollment ratios, and gross domestic product per capita are used to create the Human Development Index. Similarly, the UNDP's World Development Indicators consist of nearly 700 different indicators in five different areas: people, environment, economy, states and markets, and global connectivity. The reasoning behind using these measures is based in the belief that the use of quantifiable aggregate measures of economic, social, health or other indicators are sufficient to gauge the quality of life for a given population. Their usage and efficacy also rest on the assumption that the indicators that are being measured are objective in the sense that they are universally seen as desirable attributes.

On the other hand, subjective measures, such as those advocated by Brooks (2008) and Gill (1995), place the measurement of quality of life in the psychological realm of satisfaction and overall happiness, which is only definable by the individual and thus can only be measured

by the use of surveys of individuals. Instead of measuring what they believe to be the most important indicators of quality of life like the UNDP and World Bank do, they instead pose more open questions to the individual, which allows the respondents to express their perceived level of life quality without any bias or value weighting. For example, Gill (1995) proposes using surveys that ask the respondent to mark their level of overall quality of life on a scale of 0-100 (p. 681). This allows for the respondents to create their own value weightings for all the inputs into their lives; it is subjective to the respondent. These results may be combined statistically to draw conclusions about the aggregate population, but their true value is best attained on the individual level since responses can vary widely for numerous reasons, which can skew the aggregate results.

While both of these different approaches to quality of life measurement have made many valuable contributions to the literature, I feel that when used independently they fall short of being sufficient for a complete understanding of the driving forces behind quality of life. One of the issues that seem to be at odds between them is whether to take a macro or micro perspective of the indicators. If a macro position is taken, then the objective measures seem to be a more useful tool; however, if a micro perspective is taken, then an individual level measure is more valuable.

I assert, however, that Costanza et al. (2007) rightly deduce that these differences between the two types of measuring are not as deep as they appear. They claim that these "so-called "objective" measures (of quality of life) are actually proxies for experience identified through "subjective" associations of decision makers;" and thus "the distinction between objective and subjective indicators is somewhat illusory" (p. 18).

I assert that since there can never be a truly objective set of indicators created, due to the fact that the very selection of some indicators and not others is subjective, the fundamental argument of quality of life literature should revolve around the nature of the quantitative data that is used in the justification of subjective indicators and not around if they are used at all. More specifically, if the uses of aggregate population measures are better suited for such work or if individual preference based survey data is superior.

Another aspect of the debate surrounding the objective and subjective issue focuses on the differences in what is actually being measured. The objective measures represent environmental indicators that imply the possibility of having a good quality of life; they do not assert that their mere presence guarantees it. They represent what most people see as necessary conditions for a high quality of life, but they in themselves do not represent a sufficient condition for having a high quality of life. The subjective, micro measures on the other hand only measure a person's psychological perception of satisfaction and life quality, which may be independent of environmental conditions considered in the objective measures. What is needed is an integrated approach that allows both measures to be used together to find any connections that exist between the two.

The Economist (2005) Intelligence Unit's quality-of-life Index, which attempted to merge the traditional objective measures of economic and health data with subjective survey data taken as a sample of an area. They were able to successfully use both aggregate population data and survey data to draw their conclusions. Both aggregate population measures and individual level preference based data are necessary in order to be able to draw the proper connections of life quality in the population as a whole.

Lieske (1990) explains that the major research issues in life quality studies

> have tended to revolve around its measurement, the magnitude of differences from one city to the next, and patterns of regional variation. As a consequence, most quality of life studies have been largely descriptive and either unable or unwilling to provide much theoretical or empirical insight into the determinants of life quality differences (p. 43).

An integrated technique would provide both the theoretical and empirical depth and insight that Lieske claims has been overlooked in the past literature and would allow for the formulation of a more universal view of the quality of life in target areas.

My purpose in building a Quality of Life index is to explore the substantive effects of quality of life as suggested by Lieske (1990). I therefore include in my index sub indicators that have a strong theoretic basis for affecting the outcomes, and life quality experienced by individual citizens. In what follows I review the relevant literature for each of the sub-indicators, and explore how variation in those indicators should affect life quality.

Education

The quality of an education system in a county is a telling indicator of the quality of life in that area. And since quality of life is so connected to education, its quality is an indicator of what the future will hold for an area. Areas with better education systems have been shown to have higher levels of educational attainment, and as a consequence, higher income (Baum, & Ma, 2007). Better health outcomes are also attributed to higher levels of educational attainment and income than those who are less educated and poorer (Pincus, Esther, DeWalt, & Callahan, 1998).

In my measure of education as an indicator of overall quality of life, I capture a measure of the availability of educational services. I look at the services that are offered in public schools

in order to determine if the schools are fulfilling the educational needs of the largest number of students possible. One of the programs that I measure is the availability of college preparation courses like Advanced Placement, International Baccalaureate, or concurrent enrollment for college credit while still in high school. This allows us to capture a measure of the needs fulfillment for advanced students that could be held back from reaching their potential if these courses are not offered and they are kept with the bulk of the students in classes that don't challenge them.

I also capture a measure of the needs fulfillment of the students in a school system that may need extra assistance to succeed. The availability of a Limited English Proficient (LEP) program is measured to account for the ever-growing number of students who need extra help with English due to the diversity of home-spoken languages. In addition, I measure the availability of special education services to help those students with special needs.

Also in my measure of service availability for education, I measure the access that people in a particular county have to higher education. There is a myriad of literature on the benefits of higher education to individuals and society (Baum & Ma, 2007), and the citation here of the full literature would be superfluous. I assume that the proximity and availability of higher education make taking advantage of its benefits easier for the local population and it is a positive attribute to have access to higher education. As an education system becomes increasingly competitive in attempts to capture previously untapped markets, new technologies and efforts are being made to make higher education available to increasingly isolated places (Hanna, 1998). I expect to see access to higher education to continue to expand to the benefit of the local citizens in most counties.

The final measures of availability that I used are of the presence of charter schools in a county, as well as other education services offered such as private schools. The presence of charter schools is measured by the annual survey done by the National Center for Education Statistics (NCES) and the measure of other education services is obtained from the U.S. Census data. The presence of either or both of these indicators represent efforts by the local government and population to offer services that can be invaluable to those that take advantage of them. While charter and private schools are not designed to be to the benefit of everyone, those who wish to take advantage of their service often feel it is very important and can strongly influence their academic performance. It is also claimed by some that the presence of choices within the education system is healthy as it usually fosters competition (Forster, 2009) and increased efficiency with funding (Herzberg & Fawson, 2004).

These combined measures of service availability allow us to determine if an area has the appropriate groundwork laid in order to produce a quality education in a given area. But, even if these programs were in place and were readily available, they would still require funding in order to function. Many areas have a need to attract and retain teachers and that can only be fulfilled when there is adequate funding being given to teachers who are incentivized to work harder (Prince, 2002). I capture an area's funding effort for educational services by considering spending in three different educational areas. The first of these measures was obtained from the NCES and is the number of dollars spent per pupil by the state and federal government for education services. This number allows us see if the government is giving adequate funding for teachers and students to be able to have the facilities and teachers they need to receive a good education.

Due to the fact that a significant portion of school funding is derived from local taxes, the second measure of funding for education deals with the percent of education related spending as a percent of tax revenue. This data was obtained from the U.S. Census and it allows us to see how dedicated local government officials are to the education systems in an area by examining their propensity to dedicate a large portion of local tax revenue to it.

Finally, using U.S. Census data, I include a measure of total education related payroll spending in both the public and private sectors. This allows us to add on the previous measure of per pupil spending by also looking at the private sector's contributions to the funding effort in the way of employee compensation. Education payroll positions also can include a much wider range of employees than just teachers and a measure of the funding in this area should also have impacts on the quality of life in a given area.

If an area has a good education system, many studies assert they should have positive outcomes from that system to show for it (Baum & Ma, 2007). In the attempt to determine if an area has these positive outcomes, I use a number of different indicators to measure the education system's impact. I first looked at the dropout rate in the local secondary schools. A student is defined as a dropout if they are between the ages of 16 and 19, have not graduated from high school and are not enrolled. Those who fit this category have either failed the system or have been failed by the system, neither of which tells of a promising quality of life in an area. I expect to see a lower dropout rate in areas with better education systems.

Another outcome of a good education system is the number of persons enrolled in higher education. I use U.S. Census data to get this indicator that measures all the previous year's high school seniors who are enrolled in higher education and also the number of any others who are enrolled in higher education in the county. This allows us to see both the level of high school

students going on to attend college and also the total number of people enrolled in higher education in a given area.

The final outcome that I captured by this method is the education level of the population in the given county. Using U.S. Census data I was able to capture the percent of the population that has graduated from high school, the percent that has graduated college, and the percent that has obtained an advanced degree. This allows us to determine the level of education of the whole community which is important to understanding how much an area values education and its impacts. I suspect that a higher level of education in the community at large will correlate with the other indicators of quality of life.

Our measure of educational availability, funding, and outcomes gives an effective and telling measure of the education system in a given area. This measure allows us to adequately account for the education system of an area since, as Lyson (2005) notes, education "serves as an important marker of social and economic viability and vitality".

Public Safety

Community-wide safety and peace are important parts of the quality of life for residents. Crime, lack of fire protection, and deficiencies in other services designed to protect the security, well being, and property of individual citizens impact them negatively and reduce their quality of life. In developing a metric for quality of life, it is clear that public safety and security is an essential part of that metric. Public safety involves the prevention of and protection from potential occurrences that could jeopardize the well being or security of the general public.

To understand public safety, it is important to know the benefits of public safety service availability. I focus on two sub-indicators: the availability of police and fire protection in each

area. The available data, dichotomous availability, had no explanatory power when compiling the index. Thus, I still believe the availability of these resources important but will only include the funding effort data, which captures availability, in the final data analysis.

Fire services throughout the country are significant in identifying, developing, and promoting ways and means of protecting life and property from fire-related perils, such as house, school, car, and job-related fires, etc. In 2007, "fire killed more Americans than all natural disasters combined" from "an estimated 1.6 million fires" (U.S. Fire Administration, 2008).

Shoup and Madema (2005) in their book *Public Finance* discuss the necessity of fire service availability for protection to life and property. The authors also specify fire service's positive role in contributing to economic development: "Risk, in the sense of relative dispersion of possible outcomes of a venture, is reduced for almost any venture by an increment to fire protection service. All in all, fire protection is clearly one of the most important stimuli to economic growth". Clearly the availability of local fire services in each county is necessary in maintaining higher public safety, greater economic growth, and better quality of life for county residents.

The availability of police services in rural counties is an important contributor to the prevention of various types of property and violent crimes towards its residents. Police persons are in charge of maintaining order, enforcing the law, and preventing and detecting crime for the well being and safety of the citizens in their area. Mladenka and Hill (1978) discuss the importance of distributing police services evenly among states in order to maintain public safety.

In Gyimah's (1989) analysis of police production, he uses the crime rate to measure community safety. Although somewhat obvious, his reasoning and empirical data simply show that when "the crime rate is lower in community A than it is in community B, then it is

reasonable to postulate that community A is safer than community B" (p. 61). I can therefore determine that people will have a higher quality of life with a greater amount of police service protection.

The use of this crime data in the analysis is necessary to arrive at a more accurate measure of quality of life. It is obvious that the less frequent violent crimes occur in each county, the greater the public safety will be. Cebula and Vedder (1973) did a quality of life study on how crime affects peoples' decisions when migrating to new areas. They state that "Higher crime rates should lower net benefits obtainable from migration in a number of ways: loss through theft of property, higher insurance rates, an increase in fear and tension, etc.". Thus one can determine that quality of life is usually lower in counties with higher crime rates.

While it is clear that the presence or absence of police and fire protection is important to public safety in a particular area, it tells only part of the story. The whole story can be understood only by examining the availability of funds to provide those services. I consider the availability of funds for these services by using a measurement of per capita expenditures for fire and police services. I use this measure for two reasons. First, while spending of this sort may be subject to the law of diminishing returns, I believe that as more is spent per person on fire and police services, the higher public safety will likely be. Second, it is clear that even in areas with higher crime rates, residents perceive additional police spending as contributing positively to public safety.

According to Charney (1993), "public [safety] expenditures reflect both the quality and cost of providing public services," even if "public [safety] expenditures are not a perfect measure of the quality of public services." For example, a county with high public safety expenditures could signify an area that demands more safety spending, "rather than measuring a high feeling

of safety". Even though this is a difficult measure of public safety quality, county residents will still have a greater amount of fire and police protection if more money is spent per capita for these public services.

The amount of countywide per capita expenditures on fire and police services can act as proxies for other county spending on public safety, such as ambulance services and correctional facilities. If the data shows that a county puts a high priority on public safety by spending more per capita on fire and police services than average, it is presumably true that the county will also spend more per capita on these other public safety services.

For example, spending on ambulance services in rural counties is important for the health and life expectancy of its residents. The service's role is to help maintain the life of the injured/dying until transported to the nearest hospital for emergency care. According to Stults, Brown, Schug, and Bean (1984), communities served by a basic ambulance service, versus those served by conventional advanced ambulance care, have a lower survival rate. From this, one can also verify that counties' public safety will be much lower if access to ambulance services is scarce.

Public safety is a crucial indicator in determining quality of life. Public safety, as defined earlier, involves the prevention of and protection from potential occurrences that could jeopardize the well being or security of the general public. With the optimal amount of public safety service funding per county—in areas such as fire and police services—the greater the safety is of that particular county. I believe that the measurement of these types of services designed to protect the security, wellbeing, and property of county residents is necessary in order to have a valuable quality of life index. I conclude that county residents with greater public safety will also have a greater quality of life.

Infrastructure

Infrastructure that functions efficiently and effectively is another positive attributor to quality of life. Infrastructure is the physical and organizational structures needed for operation of a societal structure or the services and facilities necessary for an economy to function. Basic infrastructure facilitates economic transactions, allows access to services such as health and education, and provides individuals with the ability to realize their preferences for goods and services across time and space. Failing to include infrastructure as part of any metric of quality of life quickly renders that metric useless.

Our metric captures the various types of infrastructure that are necessary for individuals to maximize the other indicators of the index and their quality of life. To measure infrastructure I use both service availability and funding effort that is the existence of the infrastructure and the resources devoted to its expansion, maintenance, and replacement.

Measured infrastructure could include a wide variety of public services. I have chosen to use three indicators that I believe capture what is essential to improving quality of life. My metric represents an expansion of earlier work that has primarily focused on the provision of public or quasi-public goods such as highways as infrastructure. I assert that a more expansive definition of infrastructure is necessary. My metric both recognizes the importance of the public or quasi-public goods to infrastructure and adds private or toll goods to the measure of infrastructure.

These indicators—culinary water, grid fuel, and telephone—are measured as the percentage of households with these services directly available in their homes. This penetration metric, which uses end consumer access as a proxy for general service availability, provides a

clear picture of the development of infrastructure and allows for differentiation between areas where most residents have access and other areas where most do not.

The systemic availability of culinary water (also known as domestic water, drinking water, or potable water) is a large contributor to the well being of those with the service. Culinary water is the water suitable for human consumption or use in the preparation of food. This study measures the percentage of households per county with culinary water access directly in their homes from a communal source. I conclude that households with culinary water communally available will have a higher quality of life and that counties with higher percentages of culinary water penetration will attract more residents and more development. Howard and Bartram (2003) support this assertion, and they indicate that significant benefits are available as culinary water services are more accessible, namely advances in greater public health and sanitation.

The percentage of grid culinary water availability per county is also a proxy for government involvement and spending in that specific county. Because grid culinary water is primarily a government service, I assert that a greater percentage availability of grid culinary water in a particular county also translates to a greater amount of other government provided infrastructure in that county. For example, municipal solid waste (MSW) services and sewer services, are not recorded in the data but are highly correlated with grid culinary water provision, and because culinary water is highly correlated to the provision of MSW and sewer services, counties with grid culinary water are also likely to provide MSW and sewer services as well.

Sewer systems collect sewage waste from local buildings and are later used to either dispose of or treat the sewage for sanitary purposes. Having available sewer systems provides greater sanitation and health to the community. Likewise MSW services are also contributors to

greater sanitation and health. Furthermore a major source of water used to create culinary water is ground water, and according to Miranda, Everett, Blume, and Roy Jr. (1994), MSW services are important in reducing groundwater contamination as well as reducing other solid and hazardous waste material.

The second measure of infrastructure availability is the access to grid fuel. Having access to grid fuel is a significant measure of a county's development, and unlike the earlier measure of grid water is likely to be provided through private sources over public ones. Grid fuel is primarily natural gas, although there are other types of grid fuel used less commonly. Having household access to these fuels is a positive measure of residents' quality of life. The benefits of household access include the direct influx of fuel for heating or cooking purposes without having to actively seek the fuel; all the residents must do is adjust a switch and pay a monthly bill.

Rothfarb, Frank, Rosenbaum, Steiglitz, and Kleitman (1970) , in "Optimal design of offshore natural-gas pipeline systems" argues for the importance of a well-organized system in providing natural gas to US households and business, due to their great "depend[ence] on gas for heating and other essential services." (p. 992). The authors discuss the greater availability and reduced cost benefits consumers receive with better developed and systematized grid fuel systems. An example of grid fuel benefits was written in an article from *The Cordova Times* of Alaska. The author expands on the potential benefits of expanded grid natural gas —such as convenience, versatility, safety, improved air and health quality, value, and others—for the Cordova residents when a grid fuel system for their rural Alaskan city was implemented (Avezak, 2009).

My final measure of infrastructure service availability is the household penetration of telecommunication. Although this is not as strong of an indicator as the other two used, I believe

it to be a useful measurement nonetheless. Hudson (1995) explains very well the quality of life advantages of telecommunication availability:

> Telecommunications is a tool for the conveyance of information, and thus can be critical to the development process. By providing information links between urban and rural areas and among rural residents, telecommunications can overcome distance barriers, which hamper rural development. Access to information is key to many development activities, including agriculture, industry, shipping, education, health and social services.

Without telecommunications access, it is more difficult for residents to receive and convey necessary information for their day-to-day transactions. In addition, household telecommunications availability also presents access to minimum low-speed internet. Having at least dial-up internet available in the home can provide important communication and information access. Strover (2001) states the significance of "adequate connections to advances telecommunications infrastructure and services [for] rural communities…to be able to fully participate in the emerging information economy," in which she includes access to internet. With a greater percentage of available telecommunications services, including phone and internet, residents have greater access to communication and information that are essential to increasing quality of life.

While it is clear that the presence or absence of my selected proxies and their penetration rates provides an important picture of the level of development of infrastructure in a particular county, it tells only part of the story. The rest of the story can be understood only by examining the availability of funds to provide infrastructure. While my first set of measures speaks to the level of development of a county's infrastructure, my second set of measures speaks to the financial resources available for infrastructure and how those resources are being used.

To capture both the presence and absence of infrastructure I also analyzed the funding that is available to each county that could be used to develop infrastructure. I measure this availability both as a function of the total land area in a county and as a per capita measure. This distinction is important as both differences in size and population create differing infrastructure needs. I use utility bonding numbers and transportation expenditures as proxies for the larger suite of infrastructure goods. Using these proxies allows for both a measurement spending on immediate needs—transportation, and longer-term needs—utility bonding. This combination provides evidence for the level investment in infrastructure. Both measures are population controlled to ensure the opportunity of inter-county comparisons.

I measure the public transportation spending per capita for all US counties. Public transportation can include subways, buses, streetcars, light-rail transit, or the most common form of highway funding. Higher spending on all types of public transportation provides a higher quality of life to its residents than do counties with lower per capita spending on transportation. Transportation spending has a myriad of benefits in facilitating business, recreation, social and family, emergency health, and education travel, etc. I believe this measurement to be a valuable quality of life component in that residents will have greater options of transportation for life's every-day activities.

A key element of transportation infrastructure spending in dealing with economic development is the amount of highway spending allocated by each county. In an economic growth study by Dye (1980), he states that "highway spending emerges as the strongest correlate of economic growth" because of its ability to facilitate commerce and transportation. Weisbrod and Beckwith (1992) wrote an article discussing a few of the major benefits of having a well-developed highway system. These include the "expansion of existing business, attraction of new

business, and tourism growth" as well as "increasing business productivity over time associated with reducing shipping costs." In their argument, they also include the benefits of reduced travel time that better highways provide for residents' everyday transportation. Counties that allot more spending on highways significantly increase residents' opportunity for greater productivity and a higher quality of life.

Not measured in the data, yet highly correlated with transportation spending, is the availability of transit and airport services. If more funding is allocated for transportation by a county, it is very likely that transit services will be offered as well. The availability of local public transit services is a positive contributor to quality of life. For various reasons, numerous county residents might not have access to private transportation or the ability to travel on their own. Public transportation, whether by bus or rail, is significant to their well being when traveling to and from home to work, to shop, or to study, etc. Baum-Snow, Kahn, and Voith (2005) explain a number of benefits to having public transit accessible: "…better transit may disproportionately improve the quality of life and the quality of job opportunities…. Public transit potentially increases the access of the poor to better labor market opportunities. This comes in addition to reduced commuting times for people served by better transit.". They also add public transit's contribution to reducing air pollution.

The benefits of airport services are associated with transportation spending in that counties with transportation spending as a priority will likely have similar reasoning to provide airport services as well. Counties with airport availability provide advantages to the quality of life of its residents more than those counties who do not offer the service. The benefits of having a local airport, mentioned by Newkirk, Casavant, Cardiologist, and Worker (2002), "include economic development, health care and emergency medical services, support of business and

commerce, recreation, community activities, enriched community life…. [These] themes support the strong conclusion that rural airports clearly improve the quality of life in rural communities".

The more developed infrastructure accessible to county residents, the more it can achieve the desired economic development that brings the greatest opportunity to the people within the county. These advantages include greater access to transportation, communication, household energy, water, activities, etc. A well-constructed index that purports to measure quality of life must include a coherent measure of the infrastructure.

Health

The majority of the quality of life literature that was reviewed for this study includes a measure of health as an indicator, and inclusion in my own index was important. It is difficult, or untenable at best, for someone to have a good quality of life if they are living in unhealthy conditions or do not have access to quality health care. Maslow (1943) underscored the significance of good health when he placed physiological needs at the base of his hierarchy of needs in his explanation of human motivation. I recognize health's importance to a good quality of life and developed an indicator that would capture the effect of health on quality of life.

Review in the health measurement literature uncovered some interesting intellectual debates surrounding the demand for health care. Newhouse (1992), Hitiris and Posnett (1992) make the assertion that since per capita health expenditures follow GDP fairly closely, health expenditure consumption is elastic, indeed elastic enough that it is a luxury good since its income elasticity of demand coefficient is greater than 1.0. If their assertion that health care is a luxury good is correct, then there is a lot of spending in health care that only marginally improves quality of life and an increase in funding won't necessarily result in an increase in care.

The counter to this claim is that since health care represents a basic human need it must be a necessity and an inelastic good. Parkin, McGuire, and Yule (1987) asserts that the claim of its being a luxury good can only be measured as a luxury by incorrectly applying microeconomic data to a macroeconomic problem. Parkin et al. also claims that more spending is needed to increase health outcomes and none should be cut. He and other authors base this conclusion on their belief that basic health necessitates for many individuals are not being met in the current system and thus each unit of health care purchased is not diminishing in utility and won't be until all the societies' needs are met.

I agree with portions of both arguments and eventually came to the same conclusion as Getzen (2000) who views health care expenditures as both a necessity and a luxury that can vary with the level of analysis. On the micro level, I believe that health care is a necessity at first because a certain level of care is essential, and thus inelastic. However, due to diminishing marginal returns there is a point reached where health expenditures become a luxury, even on the micro level.

On the macro level, I am not surprised to see that Getzen (2000) comes to the conclusion that health services are a luxury since there is a massive amount of spending going into the total expenditures that has marginally less utility than the first dollars spent. While I am not sure where this point of diminishing returns is, I believe that for all of the people in the study there is at least a level of health expenditure that is a necessity that must be funded in order to have a good quality of life. The indicators are designed to capture the aggregate health care system in the test areas in order to determine if it affords individuals at least the necessary level of care needed, if not also desired luxury health goods.

To capture an aggregate measure of the health system in the test counties, I would first use a measure of the availability of professional health workers. My measure includes physicians per 1000 and health care workers per 1000 to asses this availability. Originally I had hoped to use measures of hospitals per 1,000 people and hospital beds per 1,000 people in addition to the number of professionals, but the data was not available on the county level like I needed. However, since health care requires very specific and well practiced skills, I assume that the more of these health care workers there are in a population, the more likely it is that they will have facilities to work in. This measure is sufficient to furnish a snapshot of the availability of health care facilities that I believe to be most vital to a good quality of life.

I do, however, acknowledge that there may be other factors that may also be indicators of the health of a population other than physical facility access. Socioeconomic status, educational attainment, and cultural factors have all been shown in some cases to be the single greatest determinant of health status (Pincus et al., 1998; Grossman, 1973). Grossman's conclusion that the single greatest determinant of health is the level of education a person attains may be pertinent to this study. Similarly, Pincus's conclusion that socioeconomic status is a more important indicator of health than access to care should also be covered to the furthest extent possible under the economic development indicator and should not be a confounding factor in the final measure.

While having health facilities readily available is important, the existence of the facilities is of marginal value if people do not have the resources, primarily health insurance, required to be treated in the facilities. I use a measure of health insurance enrollment to help determine accessibility. The number of people with health insurance in a community reflects a measure of access to care and is valuable to the study. The measure that I use to show the insurance rate is

taken from the U.S. Census data and includes all forms of insurance including government programs such as Medicaid and Medicare.

While it may be true that there are flaws associated with the insurance system in the country- such as overconsumption as outlined by Feldstein (1972) - I feel that the level of insurance in a county helps us to determine what portion of the population is at least having their basic health needs met. Davis, Gold, and Makuc (1981) assert that the single greatest indicator of whether or not an individual has access to the care they need is their economic status (Davis et al., 1981). While I know that this measure of insurance levels will not capture perfectly an area's access to care, my accounting for the economic status of a county in the economic development indicator, along with the measure of insurance here, should combine to give us a clear picture of people's access to care despite financial restraints.

After considering access to health care through availability and insurance, I examine what health-related outcomes are being produced from access to that care. Some scholars argue that today's unique circumstances warrant a different measure of health outcomes for today's society. They feel that it is important to break with traditional measures of health that have mainly dealt with morbidity and mortality and also take into account "diseases of civilization" like obesity and depression that have recently appeared as society has become more developed (Hunt & McEwen, 1980). It is their belief that even though there might be longer life spans and less infant deaths in developed societies, that doesn't mean that the health of the people is any better off since they see these new diseases as a drain on quality of life.

However, it is my view that while these may be real threats to the well-being of individuals, their inclusion in this measure would be very difficult to achieve since that data is not consistently available. The concerns raised by Hunt and McEwen (1980) are valid, but they

differentially affect individual populations and it is hard to make the case for using them in an over-arching measure. While my measure may not capture a complete picture overall health in a specific area, it does capture a sufficient portion of the whole system as infant mortality is a particularly telling indicator of care. It is also easily accessible for every area I looked at and universal in its application; whereas the inclusion of other subjective indicators would have to be more area specific.

I decided to use a measure of health outcomes that was the most objective possible. Nearly every study I looked at used infant mortality measures in one form or another, including the UNDP's Human Development Index (2008) and the WHO (2009) which both used measures of infant mortality as a strong indicator of quality of life and in their own indices. Consequentially I also decided to use infant mortality as the basis of my health outcomes measures. While some scholars would argue that a better measure of health outcomes would be broader than mine, I feel that very few would argue that infant mortality is not one of the most telling individual indicators of health. This measure captures the availability of non-luxury health care.

This indicator is also one of the most obvious and observable results of a good, accessible health care infrastructure that was measured earlier. My initial measurements of the availability of physicians and hospital beds are directly connected to infant mortality and the life expectancy that I measured in this indicator. Hospitals and their services are vital to helping mother's give birth to children and combating chronic sickness that often appear in the later years of life.

Health services that are readily available could still be inadequate to properly serve the needs of the patients. Health services need adequate funding to be able to function well. I measure the health services funding effort in order to determine if the services are being adequately funded and given every chance to succeed. This measure includes the overall per capita health expenditures by government agencies and the total amount spent on payroll on health care professionals.

Funding for health related services is not cheap. Some estimates place the total yearly spending in the U.S. around $3 trillion or nearly 20% of the GDP. By capturing this funding information I was able get a better understanding of the health services in the targeted areas. This then allows basic health care, which would impact the health outcome indicators of life expectancy and infant mortality, to be measured. Basic health care is defined in various ways, but for simplicity purposes I define it as access to the services and procedures that sustain life and impact of the health outcome indicators. If a person has access to basic health care, I assume they would have a greater probability of surviving birth and living to an older age.

As summarized earlier, I realize that the amount of funding does not guarantee quality since there is a real potential to waste the funds after they reach the point of diminishing returns. Evans, Barer, and Marmor (1994) are correct to point out that there is massive rent seeking and waste in the health care industry. Reinhardt (1987) is also correct to point out that health care providers are being allocated a luxurious lifestyle at the expense of patients. This however, does not diminish the fact that a certain level of funding is needed to maintain a basic level of service. By my reasoning, a higher level of funding indicates a higher likelihood that those basic needs will be filled even if there is waste continuing on after those needs are filled.

There is also good literature that indicates that higher expenditures on health care are linked to better health results (Or, 2001). Poland Coburn, Robertson, and Eakinand (1998) also seem to agree that higher expenditures on heath should produce better outcomes, but I feel that his call for increased government control of the funding would be just as wasteful, if not more than, the current system. I feel that the measurement of the funding effort for health services provides the reader with an overview of the system without making any judgments on how the system should be.

In sum, I chose to use the measures I did because they are the best way for us to capture the availability of and access to health services in a given area. My measure is objective and is comparable across the diverse areas in this study. It encompasses the causes as well as the consequences of a good health system and allows us to see its impact on the overall quality of life in a defined area.

Economic Development

Economic Development is a necessary indicator when determining quality of life. Economic Development can be defined as efforts that seek to improve the economic well-being and quality of life for a community by creating and/or retaining jobs and increasing incomes. It is the institutional changes made to promote economic betterment and the social organizational changes made to promote growth in an economy.

I have chosen to use and gather data for three categories that I believe to best determine the county residents' quality of life level, namely the availability of services, economic outcomes—such as per capita income and the unemployment rate—and availability of private

capital for the rural counties. The following paragraphs will support my argument that the more economically developed a county is the higher quality of life its residents have.

How accessible services are in each county affects the quality of life of its residents. To measure service availability I focus on the total number of employers and the number of new businesses per year in each county.

Employment is one of the most fundamental measurements of economic development. When unemployment is high, it creates a downward spiral in a community's economy: the unemployed residents cannot receive an income, which reduces consumer spending, which in turn reduces industry earnings, creating fewer jobs, and so on. Thus a healthy economy arrives as close to full employment as possible, generating more consumer spending and industry growth in the community. I chose to measure the total number of employers in each county as an economic quality of life indicator because when more opportunities are available for resident employment, residents have the ability to receive their desired income with greater ease. Hence, they will be able to better satisfy their needs and wants.

By measuring the total number of employers, the number of individual businesses within the community can be determined. Wennekers and Thurik (1999) assert that the positive economic effects from the number of small firms within a community include: "routes of innovation, industry dynamics and job generation" as well as "a lower propensity to export employment, a qualitative change in the demand for capital, and more variety in the supply of products and services".

The greater the number of new businesses established each year is also linked to a higher quality of life for residents in the counties I researched. Buchanan and Ellis (1955) list entrepreneurship, and the creation and development of new businesses, in their book as one of

the basic factors that pushes economic development. When more businesses are created, more opportunity for employment is available for the residents. Business expansion can also be evidence of more capital availability and greater response to higher consumer demand. I measured and recorded data on how many new establishments were created in each county per year to capture the entrepreneurship that is occurring in each of the counties. To calculate this activity I take the number of businesses that existed the previous year and subtract the current year's business count.

The number of new establishments contributes to a dynamic economy. According to Postrel (1998), "'dynamism' [is] an open-ended society where creativity and enterprise, operating under predictable rule, generate progress in unpredictable ways". This preservation of constant growth and improvement is necessary for the residents in these communities to have an increase in their quality of life.

Reduced employment opportunities, due to low business creation and poorly diversified business within a county, create the necessity to travel for employment. I have measured data on the number of county residents who travel for employment by determining the commute time and destination. These measures indicate how much time people are investing in a desired employment. To measure destination, I measured the percent of residents employed outside of a county. From this measurement, I can conclude that a greater percentile of residents employed outside the county of residence is indicative of a lower level of economic development in that county.

Khan, Orazem, and Otto (2001), explains the effects of commuting on individual economic growth: "if economic growth elsewhere raises an individual's earning prospects, the individual will move, but if the individual can exploit economic growth elsewhere by

commuting, he will not need to move to gain from the expansion". They chose eight states in the Midwest and researched them on a county level and determined that the local county population "responds positively to own-county economic growth, economic growth in the adjacent county, and economic growth two counties away". This provides an excellent demonstration of how multidimensional this quality of life scale is.

In other literature, Shields and Swenson (2000) conducted research on 65 Pennsylvania counties to determine how commuters balance employment and wage opportunities with relation to housing prices and travel costs. The results suggest that the "proportion of jobs filled by in-commuters varies by industry". This is an important factor because it illustrates why counties should focus on industry diversity when attracting businesses in order to best capture all types of employment.

Consequently, when services are more readily accessible in each county, its residents' quality of life is improved. With a greater number of employers and an increase in the number of businesses every year, residents are able to have more diverse opportunities for employment and the community benefits from a more diverse set of goods and services. In contrast, the further the distance a resident must travel for employment indicates limited opportunity for resident employment.

In determining the level of economic development of counties, I have chosen three indicators: economic diversity, per capita income, and the unemployment rate. Quantifying these variables will help us better measure residents' standard of living as well as economic growth by county.

The more diversified business is in a county, the higher the opportunity is for the residents to have a higher quality of life. For example, consider a county with mining as its sole

industry and source of employment. If its resources were exhausted or a natural accident occurred that made it impossible to mine, the county and its residents' quality of life would decrease substantially. An article by Phillips (1995) supports this example in stating that economic diversity is vital to sustaining development in rural areas because of the negative effects of the boom and bust cycles. In this data, I used Hachman's (1995) method to determine the economic diversity score. I therefore conclude that a county that has employment and business across diverse industries is more economically developed and can provide a higher quality of life for its resident.

Per-capita income is one of the most obvious and routinely used indicators of quality of life. Those who have a higher per-capita income have more funds to purchase the necessities as well as more disposable income to purchase luxuries. Lucas (1988), in his study "On the mechanics of economic development," argues that per-capita income is the best indicator of economic development. However, Alpert (1963) reminds us that that per-capita income is not an all-encompassing indicator when determining the degree of economic development. He uses other indicators also in this research such as dynamism in business, continuous process of capital accumulation, and other social indicators. My conclusion is the same, and my index reflects that conclusion, per-capita income is important, but not the single factor in determining quality of life.

The unemployment rate is another indicator of how economically developed a county is. This measurement has been used in many quality of life studies, a lower unemployment rate provides more opportunities for residents to find jobs which leads to higher quality of life. Phillips (1990) argues the unemployment rate is an important indicator in determining economic development. He states the need for both "basic and nonbasic employment: basic jobs are those

that bring new money into the economy" whereas "nonbasic jobs are those that recycle money through the local economy". With a high countywide unemployment rate, the need for its residents to commute for employment is much higher. The unemployment rate and commute time for employment do not measure the same thing however, a resident may not be employed in his/her own county but is employed in the adjacent county.

The final indicator seeks to measure the availability of capital in counties. Capital availability is a vital part of any county's economic development as it represents the potential funds that can be used to hire workers, develop infrastructure, and power the engine of economic growth. I used total deposits in commercial banks, manufacturing capital expenditures, and total annual payroll of all industries as the indicators.

The greater the total deposits in local commercial banks, the greater the funds readily available for use in entrepreneurial activities, for larger scale business investment, and for private investment on homes/home improvement and automobiles, and so on. Low, Henderson, and Weiler (2005) explain the positive correlation between bank deposits and entrepreneurial growth, emphasizing the effects of bank deposits on "creat[ing] loanable funds that could help regional entrepreneurs invest and grow further". These funds are of great importance to local communities because without them, new businesses cannot be established, making employment opportunities more scarce, etc.

Although funding availability through deposits in commercial banks is useful in community economic development, simple capital availability does not necessarily indicate productive potential use of the capital. Capital has a multiplicative effect when it is invested and put to use that cannot occur when it is simply held in reserve. The measurement of manufacturing capital expenditures is a valuable measurement of capital use and availability in

economic development because it illustrates how businesses apply their capital. Fisher et al. (1997) explains the economic growth benefits—including higher employment and income, among other market stimuli—to which private capital spending contributes when allocated productively. Measuring manufacturing capital expenditures is valuable in providing evidence of business growth and productivity within distinct communities due to local capital investment.

My final sub-indicator measures the total annual payroll of all industries for each county. This measure, which indicates the amount of money businesses allocate to paying employees each year, is evidence of industry growth or decline. Greater payroll indicates an expansion in the local community because industries have additional funds to pay employees after covering their costs and other financial obligations.

Payroll can also indicate the quality of human capital available in the county: employees with higher degrees and work experience receive higher wages. With greater payroll provided to employees, greater opportunity for private capital investment is available as well. The reverse is also true, as noted by Eberts and Fogarty (1987) "as private investment increases, demand for labor and thus payrolls also increase, expanding the income of the local economy". Thus, with more private capital availability, opportunity for growth and development increases, creating a greater quality of life for residents.

As described above, economic development can be defined as efforts that seek to improve the economic well being and quality of life for a community by creating and/or retaining jobs and increasing incomes. From the three areas discussed above—service availability, economic outcomes, and private capital availability—I was able to establish the advantages to having an economically developed county. I can therefore see that residents living

in a county with a more advanced level of economic development will have a better quality of life than of those whose county is less economically developed.

CHAPTER 2: Quality of Life Index

Because I define Quality of Life as, "The measured fulfillment of human wants and needs" determining how and what to measure is of paramount importance. My earlier discussion of the plethora of quality of life scales highlights this problem with some clarity. The substantive difference between indexes is focused on what the authors choose to include, what they choose to exclude, and how they weight the importance of the included variables.

I substantially agree with the basic methodological choice made by most previous scholars to conceptualize quality of life as an index. This approach to measurement, which is well established throughout social science, allows the large number of variables that explain both individual and aggregate human behavior, to be numricized, and included in statistical analyses. Numerous scholars, organizations, and a nearly innumerable number of scholarly articles use data in this way, from Likert's (1932) Scales of Attitudes, to measures of democracy (Freedom House, 1995), and of course the plethora of quality of life measures I have reviewed in detail.

However there are two common criticisms of using data in this way. First, critics argue that scaling a large amount of data into a single scale loses much of the nuance and explanatory power necessary to explain human action. Secondly, critics rightly argue, that scaling together a large number of individual indicators makes the inclusion of inappropriate, erroneous, biased, or other problematic data into the index possible, and if it is included the final result will also be corrupted. Using this garbage in garbage out model they argue that no measurement from an index that includes bad data can be trusted and that undertaking to develop indexes of this sort is problematic at best and is a fool's errand at worst.

While these criticisms are common across social science they have been particularly vocal in the area of quality of life, and have been leveled correctly against the popular indexes

including: Sperling's Best Places index, *The Economist's* Magazines Measure (2005), and the now common scales that attempt to rank individual geographies. How then, do I and the larger academic community that are engaged in working with these sorts of indexes, respond to these criticisms?

With regards to the first criticism it is certainly correct that aggregating, condensing, and scaling data loses nuance and some information. All quantitative research explicitly does this; it works with models of the world and seeks out the commonalities between cases to explain human action. The bigger question is whether this approach explains human action, and clearly when done correctly using data in this way can explain human action (Blalock, 1985).

I take the second criticism more seriously, and acknowledge that poorly built scales that do not have a strong theoretical basis for the inclusion of particular information, or the use of suspect data will indeed lead to a biased index with limited explanatory power. I take a number of precautions to limit the danger of including data that will bias my results, and root the inclusion of any piece of data in the larger theory and literature about quality of life. Yet, despite these precautions I am cognizant of the potential for error, and therefore use only commonly available data that is easily obtainable and verifiable in constructing this index of Quality of Life.

Why an Index?

Despite these pitfalls, using an index to measure quality of life provides a number of advantages when undertaking to measure quality of life on a larger scale. A properly constructed index has three key properties that are of particular value to this task. First they are reliable, because they scale data together for various observations using a set of rules; those rules mean that using identical data gets identical scores. Because indexes are reliable they are also

comparable, the end results for one observation can be directly compared to the end results for another observation. Because they use a defined set of rules indexes are also severable—meaning that any part of the index is also comparable across observations. Finally and most importantly to the scientific method, indexes are repeatable because they use data, and must define what data is included. How that data is scaled together allows future researchers to replicate the study using identical data or new data using the same scaling rules.

I believe that indexes should also have two additional properties that are not true by definition: they should be open, and they should be parsimonious. I believe that at the root of good science is data availability, and that data, which is proprietary or released only with conditions, should raise serious questions about the veracity of the results. I also value parsimony in an index, scaling together huge numbers of independent variables is a sure recipe for corrupting an index in some way, and therefore I believe that the question that must be answered when determining whether to include any particular piece of data in an index, is what does this data add to the index that isn't already there.

I constructed this index of quality of life using this approach. I was primarily concerned with creating a reliable index, and to do so I needed a strong set of rules that I could follow when scaling data into a final score. A number of systems of rules are available when constructing an index all of which meet the requirement of reliability; two types of systems were of particular interest to me. The first, which I chose not to use, incorporated a weighting scheme for variables and indicators to allow for differential effects into the scaling rules. The second system, which I did use, does not weight the included variables or indicators, leaving each variable or indicator to affect the index in equal ways.

I primarily use the second approach that is used by the United Nations Human Development Index (2007), the Economic Freedom of the World Index, (Gwartney et al. 2000) and a number of others due to limits in the underlying theory of quality of life. The results of this meta-analysis of indexes clearly showed areas that were important to quality of life and should be included in this index, although they did not provide any real indication of the relative importance of any particular variable.

The Data

Building from my preference for open data availability I use only publically available data, from two sources. The primary source used is the 2005 mid census estimate for all US counties, and the secondary source is the National Center for Educational Statistics. This data is commonly available free of charge from the United States Census website, or the NCES website. In what follows, I include the census codes of the variables I used to aid replication and verification of this index.

Building the Index/The Rules:

Because the end use of this index is not simply to enable a rank ordering of counties, I selected rules that would provide a unique score for each county, and could be used in future statistical projects. I believe that indexes should enable comparability and so I designed this index primarily to maximize variation and comparisons between observations. I determined that because I was interested in the full universe of United States counties the primary interest was in comparability within that group.

I followed a three-step procedure to scale data into this index, for each variable I converted the actual value to a scale from 0 to 1. To accomplish this scaling I used the well-tested and verified metric of the United Nations Human Development Index (2007). This method uses the maximum observed value, the minimum observed value, and the actual observed value for each observation to scale the data. The basic formula is (Observed Value – Minimum Value)/(Maximum Value – Minimum Value). Using this scaled value which represents where each observations value for a particular variable falls within the full universe of US counties, allows for direct comparability within the data set, without any further calculations. I know that a value of 1 is the maximum value, and a value of 0 is the minimum value, and between those values lies most of these observations. Because I convert each variable to this scale I can no longer measuring the actual results of a particular variable but rather the counties score in relation the maximum and minimum observed for that value. This becomes important to the next step, where I aggregate the data into sub-indicators.

Because I have scaled the variables to a ranking I can now aggregate the values using simple averages, and for each sub indicator aggregate those values by taking an average of the counties core on each of the variables included. The formula I employ uses S as the scaled value of the individual variable, and X as the total number of variables included in the sub-indicator. After taking the average I scale the data using the above formula to obtain the value of the sub-indicator.

Using the value of the sub indicators I can then calculate the value of the overall indicator using the same mechanism. Again I aggregate and rescale to achieve a final score that ranges from 0 to 1. I use the following formulas. Where SI is the scaled value of the Sub Indicator

Average, and X is the total number of sub indicators included in the variable. I then scale the average using . This provides the value of each of the sub indicators for every observation.

Using this calculated value I then calculate the final quality of life score. Again I aggregated the indicators, and rescaled to achieve a final quality of life score that ranges from 0 to 1. Using the formula , where I is the scaled value of the indicator, and X is the total number of indictors included in the index. I then scale the average using . This final scaled result is the quality of life score for each county.

This methodology is remarkably simple and allows disparate data to be combined into a common scale, but does it meet the requirements I laid out earlier for a good scale. My first concern was that of reliability. However, by applying the formulas consistently the achieved results that are given in the same data are identical; therefore this measure is reliable. My second criterion for a good scale is comparability, using this set of rules for scaling the reader can directly compare each of the counties using an identical metric—the results are comparable. The third criterion is that they must be severable, and because I scale each individual piece of data before aggregating the values one can compare counties using any subpart of the scale. The fourth criteria is repeatability, because I use commonly available census data that is gathered four times a decade, and provide a clear delineation of how I scaled that data together this scale is readily repeatable. I would also add two additional criteria that I feel are essential to a good scale, openness and parsimony. All of the data are commonly available through non-proprietary sources, and use a relatively small number of variables to create the scale; each of these criteria met what the established requirements need for a good index.

While I was establishing the rules to follow while scaling, I also undertook the job of ensuring that the data did not have to include what one of the co-authors calls ‘fancy math’. I did

so for a variety of reasons, but primarily because anytime an author adds statistical sophistication to a project, like an index, you can easily add statistical error, and increase the chances of human error in altering the index. My standard approach was to the use the simplest methodology that could still accomplish the full task. It is my belief that in regards to scale building, this approach is particularly important given the criticisms discussed earlier.

The Indicators

The index has five indicators: Public Safety, Health, Economic Development, Infrastructure, and Education. Using the established methodology I calculated scores for each of these indicators and finally an overall quality of life score. Because the literature and my understanding of these areas differ, each indicator has variable component pieces, from a single sub-indicator in the Public Safety measure, to over a dozen variables in Economic Development. In each case I used literature on quality of life, as well as the tests performed and discussed in the following chapter, to determine what those component pieces should be. For example, the original conception of Public Safety included a large number of variables that measured different areas of crime, but after further review of the literature and the testing for scalability with the other indicators I found that those measures did not add information about quality of life, instead I found that the funding effort for each of the counties was a better predictor of quality of life than the outcome of crime. A more detailed discussion is included in the following chapter.

To fully illustrate the construction of the scale I detail the process for each indicator in Appendix One. As part of that process I have included the order of operations that was followed, and provided a step-by-step number of those operations. Throughout my tracing of this process I often refer back to a specific operation, and identify that operation its sequential number within

the indicator. While this level of specificity in this calculation methodology is seemingly excessive it is included because I ultimately suggest a new index, and I am using a different method for scaling the data. It is of paramount importance that this process be clear and undisguised. I further believe that this level of detail will allow others to more easily add or delete variables or adapt this index for use with other levels of analysis or other geographic areas.

Building on the belief in the necessity of open methodology in Appendix One I provide a detailed explanation of the process of calculating each of the indicators included in this measure of quality of life. I include the needed variables, their source, and the specific operations necessary to replicate this index.

Education:

The Education indicator is composed of three sub-indicators: Funding Effort, Outcomes, and Service Availability. Taken together these indicators provide an understanding of education across counties.

The first sub-indicator in education is Funding Effort; a Q score designates the scaled results. The primary interest is in the percent of the local budget devoted to education services, per capita educational payroll, and per pupil spending. I aggregated the scaled results for each of these areas and scaled the average to obtain a score for Funding Effort.

The second sub-indicator in education are educational outcomes; a Q Score designates the scaled results. The primary interest is in the percentage of high school completers from 16-19, college enrollment, percent of total population with a high school diploma, percent of the total population with a college diploma, and the percentage of the population completing less

than ninth grade. I then aggregated the scaled results for each of these areas and scaled the average to obtain a score for Educational Outcomes

The final sub-indicator in education is Service Availability; a Q Score designates the scaled results. The primary interest is in the number of educational establishments per capita, and the availability of charter and magnet schools. I measure charter and magnet schools dichotomously with a value of 1 for counties with a charter or magnet school. I aggregated the scaled results for each of these areas and scaled the average to obtain a score for Service Availability.

Using each of the sub-indicators for Education; Funding Effort, Educational Outcomes, and Service Availability, I averaged the scores for each county, and scaled the average to calculate the final Education score.

Public Safety:

The Public Safety indicator is composed of a single sub-indicator, Funding Effort. This indicator provides an understanding of how public safety is provisioned across counties. This single indicator captures the relationship between the individual citizen and the purchase of public safety services.

The only sub-indicator in Public Safety is Funding Effort; a Q Score designates the scaled results. The primary interest is in the expenditure per capita for both police and fire. I aggregated the scaled results for each of these areas and scaled the average to obtain a score for Funding Effort.

Health:

The Health indicator is composed of three sub-indicators: Funding Effort, Rates of Health Insurance Coverage, and Service Availability. Taken together these indicators provide an understanding of education across counties.

The first sub-indicator in education is Service Availability; a Q Score designates the scaled results. The primary interest is in the number of physicians per 1000 residents, and employment of non-physicians in health care. I have aggregated the scaled results for each of these areas and scaled the average to obtain a score for Service Availability.

The second sub-indicator in Health is Funding Effort on health related activities; a Q Score designates the scaled results. The primary interest is in hospital spending per capita and payroll of health care workers, which capture both private and public spending on health in each county. I aggregated the scaled results for each of these areas and scaled the average to obtain a score for Health Funding Effort.

The final sub-indicator in health is the rate of insurance coverage for each county. I calculated this rate using the reported number of persons without coverage, as a percentage of the overall population. I then scaled these results to achieve a score for insurance coverage.

Using each of these sub-indicators for Health, Funding Effort, Insurance Rate, and Service Availability, I averaged the scores for each county, and scaled the average to calculate the final Health score.

Economic Development:

The Economic Development indicator is composed of three sub-indicators: Funding Effort, Outcomes, and Service Availability. Taken together these indicators provide an understanding of economic development across counties.

Follow the procedure below to calculate the Economic Development score:

The first sub-indicator in education is Service Availability; a Q Score designates the scaled results. The primary interested is in the availability of employment and business opportunities. The variables of interest include: total business establishments, travel time to work, location of place of work, and the change in total business establishments from the previous year (measuring new business growth). I aggregated the scaled results for each of these areas and scaled the average to obtain a score for Service Availability.

The second sub-indicator in Economic Development is Economic Outcomes; a Q Score designates the scaled results. The primary interest is in per capita income, the unemployment rate, and the economic diversity of the county. I aggregated the scaled results for each of these areas and scaled the average to obtain a score for Economic Outcomes.

The final sub-indicator in Economic Development is Funding Efforts towards economic development as measured by capital availability in each county. Using total bank deposits, total annual payroll, and total expenditures in manufacturing, I scaled these results to achieve a score for Funding Effort.

Using each of these sub-indicators for Economic Development: Funding Effort, Service Availability, and Economic Outcomes I averaged the scores for each county, and scaled the average to calculate the final Economic Development score.

Infrastructure:

The indicator for Infrastructure is composed of two sub-indicators: Service Availability, and Funding Effort. Taken together these indicators provide an understanding of infrastructure development across counties.

The first sub-indicator in education is Service Availability; a Q Score designates the scaled results. The primary interest is in the percentage of households that have access to various types of utility services. The variables of interest include: population served by public water, households with grid fuel available for use, and telephone availability penetration. These measures capture both publically and privately provided infrastructure. I have aggregated the scaled results for each of these areas and scaled the average to obtain a score for Service Availability.

The second sub-indicator in Infrastructure is Funding Effort; a Q Score designates the scaled results. The primary interest is in governmental revenues (a measure of funds available for use in infrastructure), direct expenditures on highways, and long term debt for utilities of each county. I aggregated the scaled results for each of these areas and scaled the average to obtain a score for Economic Outcomes.

Using both of the sub-indicators for Funding Effort and Service Availability I averaged the scores for each county and scaled the average to calculate the final infrastructure score.

Final Quality of Life Score:

To calculate the final Quality of Life score I aggregated the scores for each of the indicators by averaging their scaled values, and scaled that average to obtain a final quality of life score that ranges from 0 to 1. This final score allows each county to be readily compared with any other county, the final score represents where the county falls in relation to the maximum and minimum observed values. The county with the lowest averaged score across the indicator receives a final score of 0, while the county with the highest average score receives a score of 1. These scores are available where?

Interpreting the Scores:

The method for calculating Quality of Life is an explicitly comparative one because I scale all of the data instead of measuring the absolute level of Quality of Life. The ultimate goal is to measure the relative level of quality of life within U.S. counties. This is a core difference between this method and those utilized in popular media, it is impossible to define what high quality of life is, what an appropriate level should be, or if an area is deprived. What this measure does is let the reader identify where each county ranks in relation to the others.

At first glance this might not seem an important distinction, but in order to correctly utilize these measures in future projects, I must acknowledge what is, in fact, being measured. This acknowledgment returns the reader to the earlier discussion of what quality of life actually is, and how it should be measured. The final score measures the relative position of counties, in relation to each other, as a proxy for actual quality of life.

This approach is a particularly important one, primarily because on the common measures of human well being the United States and all of the counties score similarly. My

interest in quality of life is primarily in how it affects human actions, decisions, and overall outcomes for human beings. Without a strong variation across cases the explanatory power captured by any index can be nearly non-existent. This approach, however, allows the variation between counties to be maximized, and provides the statistical power necessary to better explain how differences in an areas quality of life affect those who live there.

Validation:

This method for calculating Quality of Life, as detailed in this chapter, can be readily replicated, altered, and used in pieces. The ultimate goal at the outset of this project was to create such an index and this attempt has been successful. Any researcher can replicate these scores, use this methodology to include new information, weigh existing information in different ways, or challenge that methodology directly.

In creating this Quality of Life index the ultimate goal was validity. Quality of life is such a broad area of research and therefore, its research results can prove lacking and uninformative. After reviewing much of the current quality of life literature, the goals was to develop what I believe to be a valid quality of life index that is both multi-dimensional and informative.

As I reviewed the current quality of life literature, one of the most apparent necessities a valid index needs is a multi-dimensional approach. For this reason, many indices include a variety of service and geographical variables, among others. I chose to create this index with five key quality of life indicators, which are also popular in other indices: education, public safety, infrastructure, health, and economic development. Within each of these indicators are supporting variables. With the wide range of data for each of these variables, I was able to create a highly correlated, multi-dimensional index.

A critical part of any index is the data collected. First off, the data must be relevant to the various indicators. I selected variables within each indicator and gathered their corresponding data on a county level. Next, the data must be applied and correlated to understand the meanings. Without application, data is just a long sheet of numbers. Finally, the data must be uniform, thus ensuring the quality of the information gathered and the ability to analyze and understand its meaning.

Once the data is collected, a valid index must be able to analyze that data and draw conclusions from it. The data found in this Quality of Life study indices can be used for a wide variety of purposes. Politicians can use them make better public policy choices, businesses can use them for marketing purposes, and academics can use them for research. If the data does not explain anything, it is of little use to the reader. Thus, the data must be presented in a way that it is informative. The methods used to construct a quality of life index must also be easy to understand and replicate. In order to facilitate the use of the information, the study needs to be organized and well structured for further analysis and use.

Any index, including this one, must be viewed skeptically. At the heart of the scientific method and index building is the need for validation. Indices can be plagued with measurement problems that center on whether they are actually measuring what they purport to be measuring. The prelude to testing whether an index is measuring what it claims to measure is to validate its methodologies.

The methodology for calculating quality of life scores yields a reliable and repeatable index. This index can be calculated using commonly available data, where as all parts of the index are separable. As discussed in the previous chapter, meeting these requirements is of paramount importance, if the data is to be used to explain phenomenon in the real world. As is

demonstrated in the previous chapters this methodology has been confirmed across various indexes and this method for calculating each indicator is clearly presented, and the index meets the required methodological tests.

While methodological rigor is important, even the most rigorously constructed index can fail if it does not measure what it purports to. Indices that fail in this regard are doubly problematic. Because their construction methodology is sound, often times they are accepted at face value and assumption is made that the results can in fact be used in the way the authors claim.

The preference then, as it is for most scholars, is to validate that the index is indeed measuring what it claims to. I use a three-prong approach to validating an index. First, any index that claims to measure a social phenomenon must have strong theoretical explanation to back up why the data included in the index is in fact a component of or a proxy for what is being measured. Second, the data included in the index should scale together. Finally, independent tests of the theoretical links should verify the construction of the index.

To validate this Quality of Life index I used this approach. First, I present a strong theoretical justification for the inclusion of each piece of data, and suggest the direction that the data should affect quality of life. Next I conducted a confirmatory factor and principal component analysis to verify that the data scales worked together as expected. The final step was to conduct an experiment that tests whether individuals construct their own perceived quality of life in a similar way as this index predicts they should. In what follows I discuss how each of these tests validates this index.

In choosing data for this index I sought to meet these conditions to ensure the approach yielded results that could be justified theoretically. First I sought to ensure that previous work on

quality of life included the data, or a similar type of data, as this study considered in regards to quality of life. Using a meta-analysis of previously constructed indexes I included variables that were common among two or more of the previous indexes. Second, I considered whether the data had a common sense connection with quality of life, and if so, could I predict the direction in which the data should affect quality of life.

The data included in this index meets both of these tests, in each case previous literature and common sense indicated that there was an effect on quality of life.

Factor Analysis/PCA

Since the selection of data in the index was strongly rooted in theory, I chose to use confirmatory factor analysis, and principal component analysis to verify that the included data did in fact scale together to effect quality of life.

Confirmatory factor is an analysis which attempts identify whether a series of variables, in this case these indicators, are common factors of some other unobserved phenomenon. Because I believe that these indicators should each have a positive effect on quality of life, using this approach is ideal. If the included data were in fact measuring quality of life, the reader would expect that each of the indicators would be a common factor.

This approach provides a statistical verification of the theory used to include data. Table one includes the results of the factor analysis for the five indicators—Education, Public Safety, Infrastructure, Health, and Economic Development.. Because I have laid out clear expectations the reader can interpret the results much as I would those of a hypothesis test. In this case to confirm the hypothesis—that this index is measuring quality of life—each of the indicators

should return a positive value. Further because I have not weighted the index, those values should be of a similar size.

Table 2.1

Confirmatory Factor Analysis

Variable	Factor 1	Factor 2	Uniqueness
Education	.5122	-.1826	.7043
Public Safety	.5326	-.0702	.7114
Infrastructure	.6135	.0588	.6202
Health	.4294	.2141	.7697
Economic Development	.6094	.0047	.6286

Table 2.1 reports the results of the factor analysis, in this case two factors are retained, and clearly factor one provides strong evidence that the indicators are in fact measuring a common phenomenon, which I call Quality of Life. Each of these indicators are positive with a range from .42 to .62 indicating that each of the indicators is a common factor of the same underlying phenomenon. Further, each of these indicators has a high value for uniqueness, indicating that they are not simply reflections of the same phenomenon.

To further validate the index I use a second, similar statistical methodology that also seeks to identify relationship between the indicators and an underlying phenomenon. This approach is Principal Component Analysis, which seeks to identify whether particular data are component pieces of the same phenomenon. Again the reader can interpret the PCA results as a

hypothesis test, with positive values of similar size indicating that the indicators are measuring a common phenomenon. These results are in Table 2.2.

Table 2.2

Principal Component Analysis

	Comp1	Comp2	Comp3	Comp4	Comp 5
Eigen Value	2.24297	.904585	.721901	.580413	.550134
Proportion	.4486	.1809	.1444	.1161	.1100
Variable					
Education	.4262	-.5712	.3919	.0958	.5738
Public Safety	.4450	-.2458	-.7114	.4562	-.1656
Infrastructure	.4931	.1235	-.2738	-.8126	.0792
Health	.3707	.7733	.0999	.3447	.3686
Economic Development	.4896	.0109	.5054	.0594	-.7079

The primary interest lies in Comp1, which has the largest explanatory power at .4486; this value indicates that component one is the best explained of the five components. I should expect that a single component would emerge just as component one did, and to validate the hypothesis the reader should see positive values for each of the indicators. As expected each of the indicators for comp1 are indeed positive and range from .3707 to .4931. Again like the

confirmatory factor analysis, PCA confirms that the indicators are components of an underlying phenomenon.

It is more important that the indicators are common predictors of the phenomenon than what one chooses to call that phenomenon. The beauty of factor analysis and PCA is that they find patterns in the data, and relate those patterns to outcomes. This approach, which is theory blind, provides an unbiased picture of whether the data included in the index scales together.

Given the consistent results from both of the statistical tests employed, it is clear that the indicators are measuring a common phenomenon. When this is coupled with expectations raised by the theory relied upon, it becomes apparent that the underlying phenomenon is in fact quality of life.

This validation is an important improvement over previous indexes that used only theory to justify their inclusion of particular data, and fail to test whether that theory is correct. These results indicate that not only do the indicators have strong roots in theory, but those same results indicate that the theory is correct. If the theory was simply wrong the data would not scale together as seen here.

Survey Results

To further validate this index I surveyed undergraduate students from a wide range of majors and from various years of schooling (freshman—senior). The purpose of this survey was to determine the students' quality of life.

The construction of the survey consisted of five parts. The first part analyzed the demographics of the students being surveyed, his/her university major and other university information, as well as political orientation. The second part asked students to rank their personal

situation with regards to each of the indictors. The third part related to a recent experience of a student initiated fee proposal. It asked if the student would be willing to support raising student fees in order to receive more university services, this was the distraction activity. The fourth part examined the student's general knowledge of the school, reflecting the student's knowledge of the political system within the school when given the self-tax option. Finally, the fifth part of the survey includes a quality of life scale.

The students were asked to rank the quality of his/her entire experience at Utah State University using a scale of 0 to 10, 0 being very low quality and 10 being very high quality. The surveyors instructed the students being surveyed that they must completely finish each part of the survey before they could continue on to the next part. This was to ensure that none of the survey questions that followed affected the answers from previous sections.

The students were from five different classes. Many of these classes could be chosen as general education credits, so the classes consisted of students from a wide variety of majors and emphases. The classes surveyed included one Introduction to Economic Institutions class, one General Social Systems and Issues class, two Introductions to Microeconomics classes, and one Introduction to Public Policy class. A pretest was conducted before the official surveying in order to correct any poor questions or other errors.

Once the surveys had been administered, I developed a consistent system of coding to organize the survey. For Part I, I coded the letter indicated on each multiple-choice answer. On a few questions, the student could fill in an answer, if not provided, in the space next to the "Other" option. In this case, I had created a column and typed in that student's answer; the same was done when the student wrote in his/her major. On Part II, the answers were coded on a scale from 0 to 10 with 0 being very low quality and 10 being very high quality. Part III was simple in

that I coded whether the student's answer was either "A. Support" or "B. Oppose." In Part IV, I used a dichotomous coding approach. If the student wrote down the correct answer in the blank, I entered a 1, and if the answer was incorrect, I entered a 0. Similar to Part II, I used a scale of 0 to 10 to code the student's decision of his/her overall quality of life in Part V.

For the survey results to validate the index, and further confirm the theory that underlies it I tested whether rankings on the individual indicators were predictors of respondents overall ranking of quality of life. If the phenomenon identified in this factor and PCA analyses is in fact quality of life individual responses about their perceptions of each of the sub indicators should have a statistically significant effect on their evaluation of quality of life. Therefore this approach allows me to simultaneously validate both the larger theory and the index simultaneously.

Survey Results

The results from the experimental survey are found in Table 2.3.

Table 2.3 Survey Results-Ordered Logit

N= 258 Pseudo R Square: .2254

3	Coef	Standard Error	P Score
Personal Safety	.3429	.1785	.05*
Infrastructure	.2753	.1080	.01**
Economic	.1503	.0739	.04*
Health	.3505	.1208	.00**
Education	.7941	.1246	.00**

*Control Variables excluded from table

Because interest lies in both whether the indicators are actual predictors of quality of life and the magnitude of the effect of those indicators I conducted two OLogit regressions, one with only the control variables and one with the indicators included. As seen in Table 3 each of these indicators has a positive and significant effect on quality of life. While these results indicate that

the effect is real, I was also concerned about whether including the indicators would improve the model substantively. To address this question I compared the Pseudo R Squares, both when the indicators were included, and when they were not. The controls only model had a Pseudo R Square of .0440, while including these indicators increased that value to .2254, indicating that those indicators provided much greater explanatory power than just the controls.

Given these results it is apparent that the construction of the index matches with some degree of accuracy how individuals consider quality of life. Furthermore, these results indicate that without measures of the key areas, individual level attributes have a much more diminished explanatory power.

Using both statistical techniques that work with the data included in the index, and conducting a survey that asks individuals about their personal quality of life provides a unique dual validation of the index. The first technique confirms that the selected data do in fact share a common correlate, what I term quality of life. The second confirms this index by using responses from actual human beings about their perceived quality of life.

The results of both sets of tests confirm that the index is a valid measure of quality of life. This is primarily because given the results of the dual tests the index has the following properties. First it is measuring a phenomenon. Second the tests confirm that the each of the indicators predict that phenomenon. Third, that given the theory that phenomenon is quality of life. Fourth my theory, and by extension the index, are confirmed by the survey results. Given these four criteria the reader can conclude that the index is validated both through aggregate statistical techniques and by survey techniques.

Having constructed, validated, calculated the quality of life index in Part One I now turn to how quality of life might exert influence in a variety of political and social settings in Part Two.

CHAPTER 3: Effects of Quality of Life

It is an easy claim to make that quality of life is an important factor in the decision making of individuals and that it should have a significant effect on their activities. It makes intuitive sense. Calvert and Henderson (2000), Lietske (1990), and a plethora of others have demonstrated the importance of quality of life measures with clarity.

However, what is less clear and is absent from nearly all of the extant literature on the subject is an understanding of why an aggregate measure of life quality, such as the Calvert and Henderson Index or my index, would intervene to affect individual level decisions at least generally or in looking at the macro level.

Despite this mismatch, it is apparent that aggregate measures are often predictors of aggregated individual decision making. Nowhere is this clearer than the often replicated and supremely reliable relationship between income and voter turnout. In what follows I systematically lay out three theoretical explanations for how quality of life as an aggregate measure could affect individual decision making. Then I apply those approaches to the case of voter turnout to illustrate how they might affect the decision to vote.

Three explanations are readily available to explain the mechanism by which quality of life might have an effect on the aggregated, individual decision making of groups. First, quality of life may simply be a resource that can be drawn on in the decision making process. Second, it may be that individuals' attempt to maximize aggregate life quality as part of their overall utility function. A final explanation posits that rather than being a resource or a desired ends, life quality has a direct impact on the decision process similar to the conception of Zaller (1992) or Lodge, Steenbergen, and Brau (1995), that is, the manner in which individuals make decisions is affected.

To consider these possibilities I briefly examine a thoroughly studied political phenomenon, voter turnout, and conduct a simple regression analysis. While controlling for other possible explanations, this analysis tests the hypothesis that high quality of life is positively related to higher voter turnout.

I use these results to explore how the three theories presented could explain the mechanism by which quality of life relates to political outcomes particularly voter turnout.

To begin I conducted a standard bi-variate OLS regression using the 2004 presidential election. The results of the regression are founding in Table 3.1.

Table 3.1

Voter Turnout—Bivariate
Observations 3140
Adj R-Sqr .1492

Variable	**Coef**	**Robust Standard Error**	**P Value**
Quality of Life Score	**7216.73**	**3073.31**	**.000****
Constant	**-1771.56**	**93.73**	**.000****

The bi-variate regression suggests that an increase of one point in the quality of life score yields approximately 7,200 additional voters. The literature, however, provides a number of other variables that should be significant predictors of voter turnout. To control for the most common explanations, I include minority percentage, metro area, per capita income, crime rate, unemployment rate, percent female, and total population. The results of the multivariate regression are found in Table 3.2.

Table 3.2

Voter Turnout-OLS
Observations 3140
Adj R-Sqr .9550

Variable	**Coef**	**Robust Standard Error**	**P Value**
Quality of Life Score	**1098.96**	**78.88**	**.000*** **
Percent Minority	**-.5104**	**.0049**	**.000*** **
Metro Area	**930.092**	**927.96**	**.316**
Per Capita Income	**.0452**	**.0612**	**.460**
Crime Rate	**-.1253**	**.077**	**.10***
Unemployment Rate	**130.20**	**236.68**	**.582**
Percent Female	**547.88**	**175.81**	**.002*** **
Population	**-.0409**	**.0038**	**.000*** **
Constant	**-592.87**	**89.85**	**.000*** **

The multivariate regression confirms the bi-variate result even when controlling for a variety of other causes. Given these results, providing a theoretic explanation for why life quality, as measured in Chapters 1-2 of this dissertation, has influence on voter turnout is important.

In what follows I present three possible, but not mutually exclusive, theories for the mechanism by which life quality might affect voter turnout.

Quality of Life as a Resource

Models of voting behavior suggest that voters can be used to pay costs of both pecuniary and non-pecuniary characteristics, such as social status, employment type, and social capital. This conception of resources provides an interesting theoretical possibility for how aggregate life quality might have a distinct effect on various societal outcomes.

Before undertaking to explain the effect of aggregate factors on voter turnout it is important to remember that those rates increase only when individual citizens decide to vote; thus, any aggregate explanation must be directly related to individual decisions to vote. They have used the characteristics of individuals to consider aggregate participation in the electoral process through voting.

Nie et al. (1997), Brady, Verba, and Schlozman (1995) develop a resource model of voting, where the decision to act is contingent on the individual having the necessary resources available. Nie et al. suggests that time, political knowledge, and requests to participate are key resources that should be considered. Rosenstone and Hansen (1993), and Wolfinger and Rosenstone (1980) undertake a similar task but seek to evaluate not the specific resources that an individual has but what prevents individuals from voting. In doing so, it is determined who votes. The sum of these arguments is that those with greater resources, as described by the Brady et al. model, or citizens with particular characteristics, as described by Wolfinger and Rosenstone, and Rosenstone and Hansen (1993), make up the group of likely voters.

The resource model of voting has long suggested that as resources increase the probability of individuals voting, and thus the overall rate of voter turnout, likewise increases. This notion of resource based voting submits that as resources increase, individuals and, thereby, the aggregation of their preferences, can be used to achieve particular outcomes.

However, most of the voting resource literature suggests only first order effects from the various characteristics or resources, and fails to recognize that second or third order effects might also be necessary, if not sufficient, to determine outcomes. This distinction is particularly important given the seemingly unlikely correlation between some of the resources suggested by Nie et al. (1979) and Rosenstone and Hansen (1993), but also for the purposes of this study.

Building from this approach, quality of life as conceived in this study is primarily a background variable, albeit one with theoretically demonstrated importance of a variety of societal outcomes, and one that has long been neglected in political science.

Further, the logic of this approach suggests that not only would available resources affect voter participation and turnout, but other political variables which are predicated on the involvement of individuals should similarly exhibit a relationship between some resource and the actions of the individuals.

Using the logic of resource explanations by Nie et al. (1979) and Rosenstone and Hansen (1993) to explain the mechanism by which life quality might influence political outcomes provides clear predictions about expected direction. This is especially true in regard to voter turnout rates. The resource theory suggests that as quality of life increases we would expect to see greater participation in electoral contests because the resource of life quality could be drawn upon to facilitate the decision to participate.

This approach most often considers the direct and immediate effect of such variables, that effect is not the only possible explanation. Indeed, one of the chief critiques of this sort of approach is that it fails to recognize the likelihood of multiple and ordered causation. Quality of life is likely to be a first, second or third order predecessor of a variety of social outcomes, just as social class, income, or other aggregate measures are precursors.

This theoretical possibility can be best expressed as a function of the other variables of interest and quality of life in relationship to some dependent variable.

If quality of life is a first order predecessor, the function is

Yi F(X1, X2, X3….. Q)

In this case Quality of Life is an independent variable of interest and has an independent effect on the dependent variable, controlling for the other variables.

If relationship is passed through some other variable as a second order predecessor, the function would be expressed as

Yi F(X1, X2, X3…..Xi),

Xi F(X1, X2, X3….Q)

As a second order predecessor, Quality of Life has no direct effect on the dependent variable but instead affects a Xi. It thus exerts its effect as a predecessor to an independent variable of interest.

The logic of this approach can be extended, but it is unlikely that the reality of the world is as cleanly modelable as suggested by the ordered causation that would necessarily be implied with an ordered approach to the resource model. More likely is a mix of first order effects, second, third etc. order effects.

The simplest expression of this possibility is expressed as a two-step function where life quality is a variable of interest in both functions.

Yi F(X1, X2, X3, Q…..Xi)

Xi F(X1, X2, X3,….Q)

This method could be readily tested as its simplest implication is that, regardless of the order of the effect, Quality of Life should in fact be a statistically significant predictor of the

measured outcome. However, at least three potential issues arise from this seeming simplicity. First, in order to test this proposition directly it is necessary to know what Xi is. Second, even if Xi is readily identifiable, standard statistical techniques are complicated by the nature of its predictions, which suggest an effect that might be direct or indirect. Finally, because the effect is likely to be mixed, teasing the causal relationships out is nearly impossible; even when holding the other variables constant, if any of the effect is from a secondary order the colinearity will bias the estimate of the coefficient and confuse the interpretation if life quality is a predecessor to any other variable other than Xi.

Despite these statistical problems the predictions do not change, regardless of which of the plethora of approaches is used. Thus it does not represent a large problem for the theory as presented here. The only attempt I made is to demonstrate the relevance of quality of life to political and social outcomes. Significant, further research is necessary to construct models that can deal with the problems represented by the ordered natured of the effects. Indeed, regardless of the statistical problems, the predictions of the theory are consistent and the direction of the bias should work against those predictions making it more difficult to reject the null hypothesis of no effect.

Utility Model—Rationalism

Most of the explanations of voter behavior have been focused in a maximization paradigm, and indeed the notion of maximizing might well explain how life quality influences political decisions and outcome. It seems likely that within the standard utility maximization model quality of life is a relatively easy fit. To illustrate how this might happen, a short recitation of the rationalism model of voting is necessary.

Rational Voting-Utility Driven

Understanding voter participation in the United States has been widely studied by students of American politics and by those interested in electoral behavior in particular. From these studies a variety of explanations for decisions to participate have emerged.

At the most basic level the decision to vote is an individual one, and explanations for the overall low aggregate level of voter turnout must have explicitly individual causes. Keeping this perspective in mind is of particular importance to understanding the root causes of the larger phenomenon.

Most scholars who attempt to explain why voter turnout is relatively low in the US are the intellectual progeny of work done by Anthony Downs (1957). Writing in An Economic Theory of Democracy, Downs considers voting as a personal economic act, an act that has both costs and benefits. He asserts that only when the benefits of voting outweigh the costs of voting will any individual actually vote.

Working from the cost benefit perspective of utility maximization Downs (1957) suggests a formula that attempts to explain the decision vote. Using this standard cost benefit analysis, he asserts that not only must the benefits outweigh the costs but that probability of receiving those benefits must be included in any model of the decision to vote. This basic formula of PB-C >0 provides the foundation for understanding both individual and aggregate decisions to vote.

The clear implication of the Downsian model is that the expected benefits would have to be of such a magnitude as to overcome the small probability of any one vote being determinate in the outcome of the election. Even in small communities with tiny electorates, it rapidly

becomes clear that even miniscule costs should easily outweigh such diluted benefits. The predictions from the simple cost benefit evaluation are voter turnout rates far below what is currently observed in US elections. Downs (1957) explains the discrepancy between the actual observed voting behavior and the model's predictions as being explained by civicness, patriotism, or a sense of duty.

Riker and Ordeshook's (1968) work considering decisions to vote expands Downsian civicness as the explanation for the discrepancy in individual decision to vote by including an additional term in the Downsian model of vote decision. This additional term seeks to account for influences outside of direct costs or benefits of the actual act of voting that can alter the decision to vote. This revised model, PB-C +D, allows the Downsian model of decision to vote to generate predictions of voter turnout that are in line with observed voting behavior.

Using this model of individual decision to vote provides a systematic method for considering the proximate causes of voter turnout in the United States. This model has three moving parts that can directly affect voter turnout: the benefits of voting to the voter, the costs of voting, and the illusive D term. Most convincing work on voter turnout can be directly tied to changes in one or more of these components.

While the beneficial inducements to vote are diluted substantially by the probability of being the determinant vote in the election, there are clear benefits to the individual. These benefits including: material gain from policy, preference for a particular candidate, and risk aversion to change, have all been discussed as benefits from voting. Both Brady, Verba, and Scholzman's (1995) and, later, Jessee's (2009) piece on spatial voting discuss in some detail what the potential benefits of voting can be. Jessee in particular indentifies that through voting citizens achieve ideological preferences and can connect those preferences to the outcomes of

elections. This indicates that voters can in fact identify specific benefits they might receive under some circumstances, and it gives some credence to the inclusion of the particular benefits in the model of decision to vote.

Finding evidence of this sort verifies the theoretic justification of using the economic model of voting espoused by Downs (1957), his scholarly progeny, and most work on voter turnout. While theoretically important, most explanations of decision to vote have little emphasis on the benefits of voting, and they are deficient for good reason; those benefits are greatly diluted because the probability of any single voter being determinate in any particular election approaches zero in any election, even those of among relatively small groups. Given this reality it is possible that the lack of benefits to individual voters may in fact have some effect on the overall rate of voter turnout in US elections.

Like beneficial inducements, cost barriers to voting are explicitly individual in nature; their effect is understandable only as they relate to individuals and not as they relate across geographic regions or population groups. These cost barriers can be divided into institutionally imposed costs and personal costs of voting.

A large literature has developed seeking to explain the institutionally imposed costs of voting. Those costs include: limited poll hours, registration requirements, poll location, ID requirements, and a myriad of other restrictions on voting that add complications to the interaction between the citizen and the voting booth. Most scholars have found that these institutional costs have substantive effects on voter turnout, and they appear to affect individual voter turnout decisions in meaningful ways. Rosenstone and Hansen (1993) detail many of the institutional costs of voting and suggest that taken together they have the potential to alter electoral outcomes.

In particular, significant work has been done on the effect of voter registration requirements on voter turnout. Wolfinger and Rosenstone (1980) have focused substantially on this question and have found replicated results that indicate registration requirements lower turnout. Likewise, Timpone (1998) finds similar effects and argues that registration requirements have a dampening effect on voter turnout across election locations, types, and years. Given the consistent results of scholarship in this area, many have suggested that easing voter registration requirements is a clear way to reduce the costs of voting.

A number of scholars have studied the effect of same day registration in the nine states that currently allow citizens to both register and vote on the same day. Brians and Grofman, in their 2001 study, find that allowing same day registration increases voter turnout in substantively measurable amounts. The work on the costs of voter registration rules indicates that the costs imposed institutionally are altering decisions to vote and have a real effect on overall voter turnout. Taken collectively, it is difficult to underestimate the potential effect institutional requirements might have on voter turnout in any given election.

While institutionally imposed costs are perhaps the most clearly observable costs of voting, other costs have been identified and can have a considerable effect. These costs can include preparation costs, economic opportunity costs, identity costs, or any cost that is directly associated with the act of voting. Wolfinger and Rosenstone (1980) lay out many of the costs of voting in "Who Votes?" as do Piven and Cloward (1988), and Rosentstone and Hansen (1993).

The common thread across each of these discussions of voting is that regardless of where the costs originate, they are born by individual voters. Moreover, they can be defined as costs in the Downsian equation because they can be directly tied the actor of interest, the individual deciding to vote. Unlike the beneficial inducements to vote which are conditional on being the

determinant voter the costs of voting are unconditioned and born by the actor regardless of outside influences.

The costs of voting are clearly an important part of the decision to vote equation and seem to explain why no one would vote. On the flip side is the D term which seems to indicate why, despite what can be relatively high costs to voting, individuals might still vote.

Originally operationalized as civicness, the D term serves as a catch all for any influence outside the individual actor's specific costs or benefits that can influence the decision to vote. With the expansion of the meaning of the D term has come an area of study that seeks to evaluate how the environment in which an individual exists alters his/her propensity to vote.

These influences have been widely and disparately studied, and yet these outside influences have been recognized as key to individual decisions to vote. Wolfinger and Rosenstone (1980), as well as Rosenstone and Hansen (1993), discuss a number of these influences, including social pressures, expectations among peer groups, and others that fall close to the original conception articulated by Downs (1957) and later by Riker and Ordeshook (1968). Likewise, Gerber and Green (1999) have conducted numerous field studies that attempt to parcel out what outside influences might affect individual decisions to vote. Arceneaux and Nickerson provide a comprehensive review of those experiments in their 2009 piece that reconsiders much of the data from those earlier studies. In short, they find that the D term is of paramount importance.

A number of studies have provided additional evidence for non-direct influences to vote. For example, Tam Cho (1999) finds that among recent immigrants and new citizens, the D Term is variable in construction, and that what induces one individual to vote may not induce another.

In a radical extension of what the D term might mean, Fowler Brady and Dawes (2008) find a strong genetic influence on decisions to vote among twin pairs in California.

Again we find that what is common among these studies is the reliance on individual to make the decision to vote. In short, even in the world of outside influences, the individual is the determining factor.

It is clear from both the construction of the Downsian model, and the associated scholarly work, that increasing voter turnout must be a function of either reducing the costs of voting, or increasing the value of the D term. Theoretically increasing the value of the B term might also increase voter turnout, but given the small chance of effecting electoral outcomes, this approach appears unlikely.

The decision to maximize quality of life could be appropriately understood as potentially involving some desire to maximize quality of life. For example, Riker and Ordeshook (1968) suggest civicness as a motivating factor because the direct benefits from voting are minimal. Their approach and the approach of the intellectual progeny suggest that some intrinsic motivation is the most likely candidate for inclusion in an individual's D term. I suggest that the D term might also be a function of life quality as a mechanism where expected utility from the larger societal concerns can be included in the cost benefit analysis of voting. This conception seems to square with how individuals view their involvement with voting process. It is commonly reported by individuals that they expect societal benefits even if they receive no personal ones from the act of voting.

This conception also suggests that in politics, like in economic decision making, preferences are multifaceted and multi-peaked. Indeed, it is possible to desire individualized benefits while also preferring actions that lead to societal benefits at the same time. Further,

when individual benefits are unlikely, if quality of life generally is part of a utility function, individuals will still act to maximize on that preference.

Given the rational utility approach, again, we can on average predict that individuals will prefer more to less life quality and will take action to preserve and achieve that preference. Thus an individual's utility functions include life quality among their other preferences.

Ui F(X1, X2, X3…..Q)

However, like all rational utility models, this model requires an assumption about what individual's preferences are with regard to life quality, and no matter how well justified those assumptions are, they provide a potential problem especially in circumstances where outcomes are dictated by finite resources.

Psych Model

The resource or utility models presented thus far as possible explanations have nothing to say about the individual decision maker engaged in the variety of political outcomes. A political psychology model of the decision-making processes provides an avenue for quality of life as an aggregate measure to intervene and affect those outcomes.

The roots of this approach can be traced directly to the earliest work in political behavior. It presumed that individual citizens were making decisions based on little or no information and because of the tendency to decide despite ignorance it led to suboptimal political outcomes.

This early school of thought asserted that because voters lack information, they are unable or unlikely to gain information, and therefore, answer questions about policy through a process little better than random guessing (Converse, 1964). Converse and others correctly identify a tendency of respondents to answer policy questions even when they lack information

about the policy in question (Campbell, Converse, Miller, & Stokes, 1960). These authors laid the ground work for a discussion of both why respondents answer in this uniform way and a larger discussion about how respondents come to answers without all the information.

A short review of the literature makes it apparent that something more than random guessing is occurring; respondents are utilizing decision strategies that draw on the minimal information they have to answer questions when asked (Popkin, 1991). That members of the public attempt to use information when considering public policy, leads directly to the mechanism by which quality of life might be used by individuals in decision making.

Two approaches are of particular interest with regard to how life quality might affect political decision making. The first approach is Zaller's (1992) Receive-Accept-Sample model of the cognitive use of political information. Zaller's theory suggests a three stage process for using information.

In Zaller's conception, information must first be received. The reception of information in this approach suggests that mere exposure to information, or the existence of information in the environment of an individual is not sufficient. Instead Zaller's requirement for reception is a cognitive process whereby the individuals are an active recipient of the information.

The second stage that must occur is for information to be accepted. Acceptance according Zaller's theory is a cognitively active process where a decision must be made as to whether the information is likely to be of use in future decision making. When this is the case, information is accepted

Zaller's final step provides the figurative muscle to the theory; namely, that after having received and accepted information through cognitive processes, information is now available for use in future decision making scenarios. However this information exists only in concert with

other accepted information, and the decision process then becomes a matter of sampling the relevant information and cognitively engaging in some processes of choosing between alternatives.

As is clear from his description, Zaller's conception of aggregating information for use in decision making is a cognitively intensive process where information is processed, stored, and explicitly used in decision making. This approach would suggest that individuals are aware of the life quality of their geographic area, and have processed that information, and use it directly in the decision making processes.

While this cognitively intense process is clearly desirable from a democratic perspective it seems to ignore the reality of how decisions are actually made. Indeed, Lodge, Steenbergen, and Brau (1995) suggest an alternative mechanism for understanding how voters utilize information to make electoral and political decisions. Rather than the information retention assumptions of traditional rationality models, or the information-less models suggested by Converse (1964), or even the models proposed by Zaller (1992), they suggest that the roots of electoral decision making can be found in the realities of cognitive psychology.

They suggest that individuals utilize information in fairly effective ways at the moment of reception and classify that information in relation to how it effects their evaluations of candidates. Individuals then fail, for a variety of reasons, to retain that information for future specific recall. In short, Lodge et al.'s (1995) model of electoral decision making for the average citizen operates much like a tally sheet. New information is tallied in relation to a specific decision, idea, or individual, and while no specific information is retained, the net effect of each piece of information is expressed in the final tally.

Unlike the strict cost benefit assumptions of the rational model, the online tally model requires only short term use of any particular piece of information and creates a potential shortcut to rationality that, if correct, seemingly lays aside the rejection of rationality that has been the watchword of the bulk of the study of political behavior. While their proposal is certainly attractive, evaluating whether the evidence they provide is sufficient requires some understanding of the cognitive psychology they claim as a basis. Serious consideration of whether the online tally they use truly represents marginal rationality in decision making is also warranted.

The literature provides background information that can be used to consider the foundations of the online tally. Essentially, they can be used to evaluate whether individuals actually use information in the way the online tally model suggests that they should.

One of the key claims that the online tally rests on is that human memory is likely to retain general ideas, but not specifics. For example, Daniel Schacter's (1999) piece, "The Seven Sins of Memory," is an ideal starting place to evaluate whether Lodge et al.'s (1995) conception of memory is correct. The bulk of the seven sins, or more precisely, errors in memory, are at first glance consistent with the conception of memory indicated by Lodge et al. Memory according to Schacter is likely to be transient, with access to specifics decreasing over time. However some the errors in memory seem to question the veracity of the online tally by suggesting that memories can include large amounts of inaccuracy, either through selective retention (a small problem) or through the actual creation of false memories (a big problem). If the online tally is affected by these same processes of memory, the rationality of any tally would be greatly disrupted. Fiske and Taylor (1991) identify similar issues in their book chapters that, while

anchoring the online tally in seemingly accurate conceptions of the transience of memory, also suggest the possibility of error in remembering the tally correctly.

Taking the assumptions of Lodge et al. with regard to memory as given, a second set of considerations emerge that are also important. If the online tally is in fact how information is used, what determines how the tally is made? One of the core assumptions of the online tally model is that decisions made when information is immediately available are more likely, in the rational sense, to be correct. However, Ferguson and Bargh's (2004) piece, "How Social Perceptions Can Automatically Influence Behavior," identifies situations where both decisions and action appear predetermined due to the social perceptions of the individual. They suggest that merely by introducing a concept—priming—the outcome of a decision or action can be greatly affected. For example, their research suggests that simply by priming intelligence or stupidity to subjects in an experimental setting can alter the outcome of a knowledge test in substantive ways. Likewise, Wheeler and Petty (2001), in "The Effects of Stereotype Activation on Behavior," provide similar evidence that the activation of stereotypes alone can have similar effects.

Their operationalization of stereotype activation envisions both stereotypes that include the individual (self-stereotypes), and those that do not. They suggest that self-stereotype activation is likely to occur using a threat model, which could be a rational decision process where consideration occurs yielding an alternate outcome. Their work, however, indicates that these effects can occur even when the activated stereotype is not a self-stereotype, but is rather what they term an ideomotor. This suggests that the immediate rationality envisioned by Lodge et al. (1995), may not be robust. Instead they find that the mere suggestion of a stereotype can alter both behavior and decision making, even when the individual is not part of the stereotyped

group. Their finds call into serious question the idea that even the immediate classification of information can be rational, primarily because they identify the process of stereotype activation as being non-conscious. Again Fiske and Taylor (1991) present similar information that calls into question rationality of immediacy.

However a number of scholars present an argument that poses a serious question as to whether the online tally proposed by Lodge et al. (1995) is truly the rational decision process they suggest that it is. If decisions are primarily made based on the tally of previous information, and not the actual information, I have little confidence, based on the supplemental readings, that the information will be used correctly, or even consciously. While the idea of an online tally that circumvents the problems of rationality is certainly attractive, it does not appear that it is an improvement over the limited rationality models suggest by Zaller (1992) and others.

These three approaches suggest a clear possibility for how quality of life might influence political decisions. Despite their disagreements in the particulars, each approach suggests that as individuals interact with their environment, information can be processed as individual information – Zaller (1992), as a cognitive tally mark—Lodge et al. (1995), or as a heuristic stereotype that provides information rich content to be used in decision making.

Thus the psychological approach might be best termed the lived experience theory, where the iterative interaction between individuals and their environment becomes a piece of information, heuristic, etc. that then is used in the process of decision-making. This approach, unlike the others, suggests more about the processes whereby decisions are made than a strictly positive relationship between life quality and political decision making.

This reality circumvents the problems of preference transitivity between individuals and does not require a uniform effect for the theory to be empirically validated. Indeed this approach

solves the problems of the resource model's ordered prediction, and the utility model's problem of preference stability. It speaks to the process by which decisions are made and instead suggests, in line with the empirical reality of previous work on the subject, that life quality is important and that it is difficult to estimate the direct effect.

However, despite the ability of the lived experience model to cleanly explain the effect of life quality, it does not preclude either of the other approaches from exerting influence in the political environment. Indeed, both the resource approach and the utility approach can be assimilated into the lived experience model's inputs and possible outcomes. Thus an approach that is cognizant of the all three theories is preferable.

In the chapters that follow, I test for the effects of life quality in a variety of political and social circumstances.

CHAPTER 4: Quality of Life and Trust

Skepticism and outright distrust of government have become the watchword of the political process in recent years. Indeed it is possible that no single concept has launched more political campaigns than the vanguard call that we must not trust government. Political rhetoric of this sort has been of particular interest whenever a political party of minority status and the perennial repetition of the American electoral system have created an environment where trust in government is viewed as the purview of the naïve or stupid.

Trust in others has faced a similar fate; a near constant message of the nightly news is that other people are not trustworthy and are dangerous. This message has become the lead story of nearly every nightly news broadcast, front-page news story, and internet rumor—and for good reason, it attracts an audience.

Despite the political and economic realities of these negative messages, trust in government and trust in others has long been at the foundation of the American system and most other successful experiments in democratic government. Indeed, most of democratic theory is premised on the notion that individual citizens can trust government to engage in appropriate activities and others to respect the societal rules that exist.

The erosion of political and interpersonal trust has been much maligned as a symptom of the degradation of American culture and politics. It is a real concern that continual attacks against democratic government's foundation will cause it to crumble. Volumes have been written about the need for a reinvigoration of trust between individuals and trust in government.

As a result of this aspiration, understanding what drives trust is an essential task for the political and social scientist. This undertaking has been attempted with gusto in a variety of

settings, from experiments in deliberation to large scale activism. In what follows I suggest that individual trust is directly related to the quality of life experienced by individuals.

Quality of Life

Life quality is explored in the study of how different aspects of a person's life combine to create a level of utility or satisfaction. In an increasingly connected world where differences in geography no longer limit knowledge of other places, people, and societies are increasingly comparing their quality of life to others in various areas. It is natural to notice a difference of conditions between areas. In the aggregate it is helpful since it motivates and inspires the adoption and integration of ideas and policies that work while discarding those that do not.

A working understanding of the concepts and approaches to the study of quality of life is important to recognizing the implications of public policy as designed and implemented by the government. The concept of quality of life and its measurement is frequently discussed and debated among scholars of various fields. While there are a variety of positions advocated by several disciplines, there appears to be an emerging consensus regarding its importance in understanding modern society.

Scholars of economics, sociology, political science, and social psychology have all attempted to classify and effectively quantify their definitions of quality of life to make meaningful observations of society and to formulate optimal policy prescriptions. Milbrath (1979) states that quality of life information is a useful policymaking tool because it can "identify predicaments, provide value weightings, infer prospective project impacts, assess project outcomes, suggest alternate lifestyles, [and] alert leaders to growing disaffection" (p. 32). Campbell (1981) quotes Lyndon B Johnson as saying,

> The task of the Great Society is to ensure my people the environment, the capacities, and the social structures which will give them a meaningful chance to pursue their individual happiness. Thus the Great Society is concerned not with how much, but with how good- not with the quantity of goods, but with the quality of our lives (p. 4).

The literature on quality of life is vast and touches many areas of interest. Unfortunately, it has failed to connect the overlapping indicators and methods from the various fields with each other to achieve a consensus on the definition of quality of life and how to measure it. I analyzed the literature discussing the numerous approaches to the definition and subsequent measurements of quality of life and attempted to understand their underlying differences and similarities, while focusing on the role that quality of life has in government.

One of the central debates in the literature revolves around whether the indicators used to measure quality of life should be "objective" or "subjective" in nature. Objective measures based on aggregate population data have been advocated by such agencies as the UNDP (1998) in their Human Development Index and the World Bank (2009) in their World Development Indicators. They believe that the use of quantifiable aggregate measures of economic, social, health or other indicators are sufficient to gauge the quality of life for a given population. From government policies, I can see that much of governmental focus is on achieving these qualities for their population in one manner or another.

On the other hand, subjective measures, such as those advocated by Brooks (2008) and Gill (1995), place the measurement of quality of life in the realm of satisfaction and overall happiness. Subjective life quality is only definable by the individual and is measured by surveys. These results can be statistically combined to draw conclusions about the aggregate population, but their true significance rests at the individual level since responses can vary widely.

While both of these approaches have made contributions to the literature, I feel that when used independently they fall short of being sufficient for a complete understanding of the driving forces behind quality of life. The issue that seems to be at odds between them is whether to take a macro or micro perspective of the indicators.

I assert, however, that Costanza et al. (2007) rightly deduce that these differences between the two types of measuring are not as deep as they appear. They claim that these "so-called "objective" measures (of quality of life) are actually proxies for experience identified through "subjective" associations of decision makers;" thus, "the distinction between objective and subjective indicators is somewhat illusory" (p. 18).

I stress that since there can never be a truly objective set of indicators created, due to the fact that the very selection of some indicators and not others is subjective, the fundamental argument of quality of life literature should revolve around the nature of the quantitative data that is used in the justification of subjective indicators and not around if they are used at all. Lieske (1990) explains that the major research issues in life quality studies "have tended to revolve around its measurement, the magnitude of differences from one city to the next, and patterns of regional variation." (p. 43). An integrated technique would provide both the theoretical and empirical depth and insight that Lieske claims has been overlooked in the past literature and would allow for the formulation of a more universal view of the quality of life in target areas.

Building from these descriptions I define Quality of Life as "the measured fulfillment of human needs and wants". I feel that this definition provides the opportunity for the theoretical and empirical depth that other studies of quality of life have lacked, and if measured correctly should allow us to make strong conclusions about the differential effect of quality of life across

areas. I am cognizant of the potential for error, and therefore use only commonly available data that is easily obtainable and verifiable in constructing my index of Quality of Life.

Despite the pitfalls using an index to measure quality of life provides a number of advantages. A properly constructed index has three key properties that are of particular value to my task; they are: reliable, comparable and repeatable. Scaling data together for various observations using a set of rules, and those rules mean that using identical data gets identical scores. This makes the indexes reliable and comparable. Finally, and most importantly to the scientific method, indexes are repeatable. Future researchers can replicate the study using identical data or new data using the same scaling rules.

I constructed my index of Quality of Life using this approach. My first interest was creating a reliable index. To do so I needed a strong set of rules that I could follow when scaling data into a final score. A number of systems of rules are available which meet the requirement of reliability. Two types of systems were of particular interest. The first incorporated a weighting scheme for variables and indicators to allow for differential effects. The second (which is used in this analysis) does not weigh the included variables or indicators, leaving each variable or indicator to affect the index in equal ways. This provides strength of measurement by including all indicators equally.

The United Nations Human Development Index (1998), used the second approach the Economic Freedom of the World Index (2008) and a number of others. I made the decision not to use a weighting scheme primarily due to limits in the underlying theory of quality of life. The results of my meta-analysis of indexes clearly showed areas that were important to quality of life and should be included. However that analysis did not provide any real indication of the relative importance of any particular variable.

Trust Literature Review

There has been a significant, aggregate decrease in trust between both individuals and individuals and the government since the late 1960s (Rahn and Transue, 1998; Hetherington, 1998; Anderson and LoTempio, 2002). Rahn and Transue note the decrease in trust that individuals have in each other has decreased significantly between generations. Further, they prove Tocqueville's (1845) idea that Democracy is subverted by materialism because it deteriorates social trust between individuals. Rahn and Brehm (1997) found a correlation between social trust and trust in government, and they find that confidence in government is very relevant to trust in government.

Since 1964, the portion of citizens who feel big corporations run the government has shifted from 2/3 to 3/4 (Hetherington, 1998). Hetherington argues that the decrease in trust is related to the government's provision of social services. Citizens tend to trust governmental programs that benefit them at little to no cost and have become increasingly dissatisfied with government as policy becomes less progressive. These policy problems stem from the fact that citizens have little understanding of the federal budget, where tax dollars are spent and how much money the federal government wastes. The social programs implemented by the Great Society set high expectations for government, and politicians have had a difficult time fulfilling these policy expectations.

There have been several attempts to explain how trust occurs between a government and its citizens. The most cited of these theories is Easton's (1975) definition of diffuse and specific support. Diffuse support is general support for an authority, regardless of the outputs. It usually results from socialization or experience. Specific support, on the other hand, relates to how satisfied individuals are with the perceived authorities around them. Typically this relates to how

individuals evaluate their demands of government as being met. There have been several studies that attempted to demonstrate whether support for the government is provided through diffuse or specific support and the implications each would have (Caldeira and Gibson, 1992; Miller 1974, Citrin 1974).

In an effort to provide evidence for one of Easton's types of support, Miller (1974) and Citrin (1974) took opposite sides and attempted to prove how trust was given to the government. Using varying public polling data both authors endeavored to trace public trust. Unfortunately, the polling questions were not worded so as to explicitly ask about one of type of support. Miller focused on race relations to demonstrate that there is distrust in the basic institutions of government. He finds that the Vietnam War caused a basic distrust on both the Left and Right, leading to dissatisfaction with the policies by both parties. Citrin focused his argument on citizens' dissatisfaction with current policies. He found that citizens support the basic institutions and often only have issues with specific policies.

This institutional support has especially been demonstrated in approval of the US Supreme Court. Caldeira and Gibson (1992) found that support for the Supreme Court has generally been supported, despite the decrease in trust in 'government'. They attempted to distinguish between diffuse and specific support and found that most whites and blacks would block any attempts to remove the Supreme Court; those who value liberty over social order and individuals who are more trusting have more support for the Supreme Court.

Caldeira and Gibson's (1992) work supports Citrin's (1974) claims and further supports his idea that policy discontent is the source of political cynicism. Additionally, Citrin acknowledges that it has become fashionable to distrust Washington; even politicians have to distance themselves in order to be elected (Hetherington, 1998). Citrin's later work with Green

(1986) found a resurgence of trust from 1980-1984 regardless of gender, economic situation, geographical location, education level and age. Even African Americans, who have been shown to be less supportive of the government, did not become more cynical during this period (Citrin & Green, 1998; Avery, 2009).

It is interesting to consider why African Americans have generally been less supportive of the government than whites. It is (or Caldeira and Gibson find) found that African Americans link trust with racial identification (Caldeira & Gibson, 1992; Rahn & Rudolph, 2005). There is also more approval among African Americans to make changes to basic institutions such as the electoral system. Data from the 1996 Black National Election Survey found support for a third, African American political party (Avery, 2009). African Americans have also been less supportive of the Supreme Court than whites (Caldeira & Gibson, 1992).

Building from this work a shift in the literature towards discovering what factors drive trust has begun. Mishler and Rose (2001) argued that trust was exogenous and rational. Early in life citizens learn the standards by which they should evaluate their trust in government; this trust is then tied to the government's performance. The authors found strong support for their theory that trust is based on institutions in both the United States and post-Communist countries. Their institutional theory demonstrates that the macro level performance by the government is mediated by micro level value perceptions. They agree with Hetherington's (1998) claims that trust can be rebuilt once politicians promote policies that the public views as priorities, eliminate corruption, and protect freedoms. Additionally, they find a strong correlation between this theory, institutional trust and economic outcomes.

One of the biggest factors affecting trust is the state of the economy. Many studies have found that a positive economic outlook is necessary for citizens to have greater levels of trust in

the government (Rahn, Yoon, Garet, Lipson, & Loflin , 2009; Chanley, Rudolph, & Rahn, 2000; Anderson & LoTempio, 2002; Citrin & Green, 1986; Mishler & Rose, 1997; Hetherington, 1998). Since the institution of the Great Society, citizens expect the government to provide a healthy economy and financial support even when the economy isn't robust. Hetherington (1998) found that poor economic conditions during the mid-1970s led to a greater decrease in trust than did the Watergate Scandal.

The Vietnam War and racial issues during the 1960s and early 1970s seem to be another factor that affected trust (Markus, 1979; Hetherington, 1998). Markus found that these two issues had the greatest effect on increasing the cynicism of younger generations. In addition to this, the presence of political scandals and rising crime rates has been particularly harmful to feelings of trust (Chanley, Rudolph, & Rahn, 2000; Chanley, 2002; Rahn et al., 2009). Presidential image, as it relates to policy and scandals is also important to public trust of the government (Citrin & Green, 1986; Citrin, 1974). Hetherington (1998) supports this claim that Presidential image affects public trust. He explains that this is because the President has become the image that often represents the government and has taken an increasing role in dictating policy. Chanley et al. (2000) found, however, that Congressional approval ratings and scandals were more directly linked to trust. Postmodern values have also been blamed for the decline in respect for authority. Both Nye (1997) and Hetherington (1998) cite the expected role of government in creating a high quality of life being unmet as a reason for the decrease in trust.

Using American National Elections Studies data, Keele (2005) attempted to measure trust as it associated with party identification. He found that those who identify themselves as independents have less trust than those who identify with a party, even if that party is not in power. Keele cites Hardin's (1998) explanation that by associating oneself with a party that

individual is demonstrating more trust because there is a willingness to rely on a party, and one is expecting that party to have actions that are relevant to him. Additionally, a person will trust the party he/she identifies with because he/she does not trust the other party. Keele found that, overall, Democrats are more trusting than Republicans and that trust increases as the party one identifies with comes into power. He also found a six-point difference in trust between partisans and their presidential administrations, a difference that switched with perfect regularity between administrations. His study confirmed earlier findings that policies affect cynicism and that the economy and presidential support are important for trust.

One phenomenon associated with dissatisfaction of the federal government has been an increase in support for local governments. This 'devolution revolution,' according to Rahn and Rudolph (2001), has given local government many powers typically reserved for national governments. Rahn et al. (1997) has also found that voter turnout, on a local level, has a significant correlation with trust. According to Rahn and Rudolph (2001), citizens trust their local governments when they efficient, are perceived to maintain a high quality of life and have mayor-council systems.

Despite this trend in local government overall trust in government has been a downward slide (Hetherington, 1998; Chanley, 2002). Continual economic problems, increasing political scandal, decreasing approval of Congress, and a host of other problems have contributed to this decline. While some, such as Anderson and LoTempio (2002), and Miller (1974), are afraid that this will lead to a dismantling of the current political system, there is plenty of data arguing against this possibility. Support for individual policies and politicians remains low, but support for the current government system remains high.

Theory

Trust as an object of interest has largely been studied by the political behavior literature as the end result of some psychological processes whereby individuals express a willingness to trust others as a function of some set of iterative processes. Simply put trust develops overtime and through a variety of experiences.

The development of trust as is traced above suggests that a model based on an individual's lived experience is the process by which trust can be developed and affected. Zaller (1992), Lodge et al. (1995), and others have suggested these sorts of models. They have as their common root the notion that as an individual interacts in the environment, that environment provides a series of cues about whether others, including government, can be trusted.

Zaller (1992), for example, suggests a model of Receive-Accept-Sample. This approach requires that information must first be received. The reception of information in Zaller's approach is more than just being exposed to information. It is instead a cognitively active process where individuals actively process information in order to receive it.

Even if information is received, a decision must be made as to whether the information is to be accepted and placed into memory for use in future decision making. Because this processes is repeated, iteratively large amounts of information is available that is likely to be of use on any subject. Decision making becomes a process of sampling the relevant information and applying it to the decision at hand.

Unlike Zaller's cognitively taxing strategy, Lodge, et al. (1995), suggest an alternative mechanism for understanding how information might be used. They suggest that rather than retaining large amounts of accepted information individuals use cognitive shortcuts whereby information is reduced. In short, Lodge et al.'s model of decision making for the average citizen

operates much like a tally sheet where new information is tallied in relation to a specific decision, idea, or individual. While no specific information is retained, the net effect of each piece of information is expressed in the final tally.

Despite their disagreements in the particulars, each approach suggests that as individuals interact with their environment, especially environments that can be compared across individuals, that information can be processed as individual information – Zaller, as a cognitive tally mark—Lodge et al., or as a heuristic stereotype that provides information rich content to be used in decision making.

Thus information about life quality, whether received and accepted or simply tallied, becomes a part of the processes whereby individuals formulate decisions and take action. Given this fact, it is clear that if life quality is being used by individuals to make decisions, such as those about whether to trust others and government, it should be possible to identify a unique effect of that life quality on those responses.

Hypotheses

My theory lends itself two hypotheses about two types of trust. The first is focused on trust for institutions of government and the second focuses on interpersonal trust, or trust in others. Given that the lived experience theory suggests only that an effect will be present, my first hypothesis recognizes that an expression of trust in government is likely to be directly linked to outcomes like quality of life. H1 is: respondent's trust in government as reported on the questionnaire is related to their measured quality of life. My second hypothesis is related to the first but takes into account the fact that interpersonal trust is not the same as trust in government and yet is a desirable social and political outcome. This second hypothesis directly examines

how life quality affects the decision of respondents to express trust in others. H2: respondent's trust in others as reported on the questionnaire is related to their measured quality of life. Given these hypotheses the null hypothesis in both cases is that no relationship exists.

These hypotheses seek to test only whether quality of life is in fact related to trust in others, including government. These hypotheses, then, do not suggest whether increasing quality of life is a strategy to improve trust but instead suggest whether such an endeavor might be fruitfully explored in future work.

Methods and Data

The data for this paper includes data from the 2004 National Election Survey (NES) and my constructed Quality of Life index. This analysis draws on these constructed quality of life measures and combines them with the NES responses to explore the effect of life quality on expressions of trust. Not every county in the United States is represented in the NES survey and I match respondents with the data for their county.

Building from my preference for open data availability, I use only publicly available data. My primary sources are the 2000 US Census and the 2005 mid census estimate for all US states. My secondary source is the National Center for Educational Statistics (NCES). This data is commonly available free of charge from the United States Census website or the NCES website. Appendix One include the census codes of the variables I used to aid replication and verification of the index.

I followed a three-step procedure to scale data into my index. For each variable I converted the actual value to a scale from 0 to 1. To accomplish this scaling I used the well-tested and verified metric of the United Nations Human Development Index. This method uses

the maximum observed value, the minimum observed value, and the actual observed value for each observation to scale the data. The basic formula is: . Using this scaled value, which represents where each observation falls within the full universe of US states, allows for direct comparability within my data set without any further calculations. I know that a value of 1 is the maximum value, and a value of 0 is the minimum value, and between those values lie most of my observations. Because I convert each variable to this scale, I am no longer measuring the actual results of a particular variable but rather the state's score in relation to the maximum and minimum observed for that value. This becomes important to my next step, where I aggregate the data into sub-indicators.

As I have scaled the variables to a ranking I can aggregate the values using simple averages. For each sub-indicator I aggregate those values by taking an average of the state's score on each of the variables I include. The formula I use is , where S is the scaled value of the individual variable, and x is the total number of variables included in the sub-indicator. After taking the average, I scale the data using the above formula to obtain the value of the sub-indicator . Using the value of the sub-indicators I can then calculate the value of the overall indicator using the same mechanism. Then I aggregate and rescale to achieve a final score that ranges from 0 to 1. I use the following formula: . SI is the scaled value of the Sub-Indicator Average, and X is the total number of sub-indicators included in the variable. I then scale the average using . This provides the value of each of my sub-indicators for every observation.

Using this calculated value I then calculate my final quality of life score. Again I aggregate the indicators, and rescale to achieve a final quality of life score that ranges from 0 to 1. I use the formula , where I is the scaled value of the indicator, and x is the total number of

indictors included in the index. I then scale the average using . This final scaled result is the quality of life score for each state.

My index of Quality of Life has five indicators: Public Safety, Health, Economic Development, Infrastructure, and Education. Using my established methodology, I calculated scores for each of these indicators and finally an overall quality of life score. This is developed from the literature, and my understanding of these areas differs. Each indicator has a variable number of component pieces, from a single variable in Public Safety to over a dozen in Economic Development. In each case, I used literature on quality of life to determine what those component pieces should be. For example, my original conception of Public Safety included a large number of variables that measured different areas of crime, but after further review of the literature and testing for scalability with the other indicators, this did not add information about quality of life. Rather, I found that the funding effort for each state was a better predictor of quality of life than the outcome of crime. A more detailed discussion can be found in "Quality of Life in the Rural West" from the Institute of Public Lands and Rural Economics at Utah State University.

National Election Survey Data

The survey data used in this analysis is taken from the 2004 National Election Survey (NES) conducted during the presidential election season. The NES is a face-to-face survey utilizing a probability sample and has been extensively used by scholars to study a variety of political and social structures.

The 2004 NES was conducted from September 7, 2004 until November 1, 2004 with a post-election series from November 3, 2004 to December 20, 2004. The 2004 study produced

1,212 interviews, which were face-to-face interviews, of approximately 70 minutes. The 2004 NES included a series of questions about trust (F2Q3. INTRODUCTION - TRUST IN GOVERNMENT) and I use two questions from this section to test my hypotheses. Further, I use information collected about respondents and other responses to questions as control variables.

I use the NES's generic trust question to test the proposition that general trust is higher in high quality of life areas. I specifically use the question, "Can People Be Trusted?" (P045158 Q216.f2k3). I use Logit to appropriately account for the structure of the data in the dependent variable; the data is Coded 1 for "Can be trusted" and 0 for "Can't be too careful".

The question's wording is as follows:

> Turning to another topic. Generally speaking, would you say that MOST PEOPLE CAN BE TRUSTED or that you CAN'T BE TOO CAREFUL in dealing with people? VALID CODES: 1. Most people can be trusted 5. Can't be too careful MISSING CODES: 8. Don't know 9. Refused.

To test the proposition that trust in government is higher in high quality of life areas I use P045149, Q207.f2q3a. "Trust Government To Do What Is Right" question from the post-election survey.

The question wording is as follows:

> How much of the time do you think you can trust the government in Washington to do what is right -- JUST ABOUT ALWAYS, MOST OF THE TIME, or only SOME OF THE TIME? Responses are coded as: 1. Just about always 2. Most of the time 3. Only some of the time 4. Never {VOL} MISSING CODES: 8. Don't know 9. Refused.

Because the question asks respondents to rank order their level of trust in government from 1-4 with 4 being "Never", I reverse the order of responses so that higher responses indicate more trust and use Ordered Logit to test my hypothesis.

Tests and Results

Using the survey results from the 2004 National Elections Survey (NES) and my quality of life score I run two sets of regressions to test each of my hypotheses. I begin with a simple bi-variate approach to establish a baseline for the relationship, the results of which are included in Tables 4.1 and 4.2. Using these results, which are statistically identical to simple correlations, I can better assess the reliability of the multivariate results and can bolster claims of a relationship between life quality and levels of trust. This approach, which first attempts to identify a relationship in the bivariate case and then turns to a multivariate approach, has the added benefit of using a staged process that provides a double check on any confirmation of the hypothesis test.

In contrast, the multivariate approach allows both hypotheses to be tested in light of various competing and plausible alternative explanations for respondent's reported trust in others and in government. However, for my hypotheses to be confirmed, both the bi-variate and multivariate regressions should yield statistically significant and directionally similar results.

Bivariate

Table 4.1
Trust in Others (V045186)—Logistic regression
Observations 1058
Pseudo R Sqr .0112

Variable	**Odds Ratio**	**Standard Error**	**P Value**
Quality of Life	**10.62**	**6.30**	**.000*** **

*P<.10 **P<.05 ***P<.01

Table 4.2
Trust in Government—Ordered Logit
Observations 1058
Pseudo R Sqr .03

Variable	Coef	Standard Error	P Value
Quality of Life	**-1.4694**	**.573**	**.01*** **
Cut 1	**-2.9673**	**.2064**	
Cut 2	**-.1773**	**.1433**	
Cut 3	**-4.7330**	**.311**	

*P<.10 **P<.05 ***P<.01

The results from both bi-variate regressions indicate that I can reject the null hypothesis of no effect and that life quality as measured by my index has a statistically significant relationship with the reported levels of trust from the 2004 NES respondents. In the first analysis, Trust in Others, the direction of the effect is that as life quality increases, the odds that a respondent would indicate that people can be trusted most of the time increased substantially.

In contrast, the Ordered Logit returns a negative coefficient that indicates the relationship between life quality and trust in government is negative. Thus these results suggest that as life quality increases, individuals are more trusting of each other and less trusting of government. Further, they confirm the theory presented above that trust is determined, in part at least, through a process where lived experience is included in the formulation of a response.

I include controls that fall into three categories: interview scenario variables—to account for variations in the interviewing context, personal situation variables—to account for demographic and other personal characteristics, and political ideological measures—to control for ideological effects on trust. Each of these categories has been hypothesized as related to trust, and to properly specify the model they must be included. To maintain consistency I use the same control variables in both regressions.

The interview scenario variables are: Interview Form, which identifies the question format used and is coded as a dichotomous variable; Length of Interview, the length of the interview in minutes; and Payment Amount, the amount paid to the respondent for completing the interview.

The Personal Characteristic Variables include: House Hold Size, including all those residing in the household; Children in the Household, those under 18 years of age residing in the house hold; Male, coded dichotomously; Single Family Home, whether the residence is a freestanding single family dwelling; Better Off Than One Year Ago, whether the respondent feels he or she is better off today than last year; Religion Importance, coded as 1 for important 0 for not important; Urban Scale, a five point scale from rural to urban; Visible Security, measured as whether security measures, including alarm systems, barred windows, or other security precautions beyond lock and key, are taken at the residence; Age, in years; Marital Status, 1 for married and 0 for unmarried; Years of Education, the total number of education years completed by the respondent; Employment Status, 1 for employed 0 for not employed; and White, whether the respondent is white or non-white.

The Political and Ideological measures include: Voter turnout in 2000, self reported by the respondent. TV News Days, the number of days a respondent tuned into the television news. Political Signs, whether the interviewer observed political signs at the residence. Country on the Right Track?, whether the respondent reports that he or she believes the country is on the right track. Liberal Conservative Index, a seven point scale from Very Liberal to Very Conservative. Democrat, whether the respondent identifies as a democrat. America Shame, response to the NES question regarding whether the United States has engaged in any activity that the respondent feels shame for.

Using these control variables and my quality of life score, I test each of the hypotheses again; the results are included in Tables 4.3 and 4.4.

Table 4.3
Trust in Others- Logit
Observations 995
Pseudo R2 .0749

Variable	Coef	Robust Standard Error	P Value
Vote in 2000?	**1.217**	**.2116**	**.25**
TV News Days	**.9815**	**.0262**	**.48**
House Hold Size	**.8993**	**.1017**	**.34**
Children in Household	**.9243**	**.1293**	**.57**
Male	**1.059**	**.1535**	**.68**
Single Family Home	**.8714**	**.1911**	**.53**
Political Signs	**1.1047**	**.0919**	**.231**
Better off than 1 year ago?	**1.9212**	**.9261**	**.17**
Religion Important	**.8590**	**.1309**	**.31**
Interview Form	**.9420**	**.1614**	**.72**
Length of Interview	**.8755**	**.0673**	**.08***
Payment Amount	**1.0020**	**.0033**	**.53**
Urban Scale	**.9962**	**.0059**	**.52**
Visible Security Measure	**1.0290**	**.0801**	**.71**
Country on Right Track?	**1.0755**	**.2207**	**.72**
Liberal Conservative Index	**1.4795**	**.2361**	**.01****
Democrat	**1.5370**	**.3010**	**.02****
America Shame?	**1.1095**	**.1905**	**.54**
Age	**.8209**	**.1586**	**.30**
Married	**1.0160**	**.2133**	**.00****
Years of Education	**1.2702**	**.2133**	**.15**
Employment Status	**1.2196**	**.0412**	**.00****
White	**1.5003**	**.2664**	**.02****
Quality of Life	**8.2011**	**5.6651**	**.00****

*P<.10 **P<.05 ***P<.01

The results from the logistic regression are reported as odds ratios—whether increases in the variables make it more or less likely that the respondent will report that he or she trust others. These results indicate that as my Quality of Life scale increases, it is substantially more likely that the respondent will indicate that they trust others.

These results further confirm that we can reject the null hypothesis of no effect and are substantively similar to those from the bi-variate regression all be it with improved model fit and explanatory power.

Table 4.4
Trust in Government.—Odered Logit
Observations 995
Pseudo R2 .0743

Variable	Coef	Robust Standard Error	P Value
Vote in 2000?	**-.1798**	**.1649**	**.27**
TV News Days	**.0088**	**.0252**	**.72**
House Hold Size	**.0640**	**.10450**	**.54**
Children in Household	**-.1786**	**.1292**	**.16**
Male	**-.1546**	**.1373**	**.36**
Single Family Home	**-.0120**	**.0780**	**.87**
Political Signs	**.0661**	**.4443**	**.88**
Better off than 1 year ago?	**.2346**	**.1436**	**.10***
Religion Important	**.2878**	**.1655**	**.08**
Interview Form	**-.1337**	**.0725**	**.065***
Length of Interview	**.0017**	**.0082**	**.58**
Payment Amount	**-.0109**	**.0056**	**.05****
Urban Scale	**-.0310**	**.0619**	**.83**
Visible Security Measure	**-.1444**	**.1940**	**.45**
Country on Right Track?	**.9857**	**.1515**	**.00*****
Liberal Conservative	**-.2734**	**.1925**	**.15**
Democrat	**-.1164**	**.1626**	**.47**
America Shame?	**-.4782**	**.0054**	**.00*****
Age	**.0097**	**.0054**	**.07***
Married	**-.1750**	**.1575**	**.26**
Years of Education	**-.0638**	**.0805**	**.08***
Employment Status	**.2656**	**.1610**	**.09***
White	**.2443**	**.1674**	**.14**
Quality of Life	**-1.1289**	**.6501**	**.08***
/Cut 1	**-5.1789**	**.73062**	
/Cut 2	**-.4235**	**.6734**	
/Cut 3	**2.9240**	**.6882**	

*P<.10 **P<.05 ***P<.01

To test my second hypothesis I used an Ordered Logit because the dependent variable was structured as an order scale from 1 to 4. Here the results are reported not as odds ratios but as OLOGIT coefficients, which are not directly interpretable; however, like my first hypothesis, the results of the bi-variate regression are confirmed and Quality of Life remains a statistically significant predictor of trust in government.

Taken together, the results from both the bi-variate and multivariate hypothesis tests make it clear that the null hypothesis of no effect can be rejected. Also, it seems that Quality of Life is related to articulations of trust—positively in the case of interpersonal trust, and negatively in the case of government.

Understanding Quality of Life and Trust

These results appear to confirm the notion of the larger theory; information from an individual's environment like Quality of Life can exercise an effect on decision making even when those variables are primarily from the background against which individuals live their lives and make decisions.

These results further bolster the longstanding assertion by those who study quality of life that life quality is an important part of the socio-political environment and that failing to consider the effects of life quality can result in a skewed understanding of the political and social world.

Despite the confirmation of the importance of quality of life, these results paint a somewhat contradictory picture about how life quality influences the development and expression of trust by individual respondents in the 2004 NES. On one hand, higher life quality is related to higher inter-personal trust—an outcome the literature would laud as improving democratic practice and outcomes. On the other hand, higher life quality is related to lower trust

in government—a result that has seemingly negative implications for democratic outcomes and practice. However, these results are not necessarily as contradictory as they seem at first glance.

If we begin with the assumptions of the utility model of decision making, these results make much more sense. The first axiom of any utility model is that individuals prefer more utility to less utility and the same might be said of life quality. It would be difficult to highlight a situation where an individual, all else equal, prefers a lower quality of life to a higher one. Building from this assumption, that the preference for quality of life is part of the single peaked utility function of the economists models, two types of actions are likely to provide an explanation of the actions and decisions made by individuals. In fact, individuals are likely to take actions in two areas. First, they might take actions that they believe are likely to increase their life quality or, at least, leave it in the steady state. Second, they might take defensive action to prevent a reduction in that life quality by proactively preventing change to that steady state by others.

Indeed, if this is the case, an individual's experience may indicate that trusting others leads to an increase in quality of life or, at least, has failed to negatively impact in past decisions. Deciding to trust is a low cost decision and one that the individual can, with some accuracy, predict the outcome of that decision. Further, if individuals perceive government has having a primarily negative impact on their quality of life, a reluctance to trust government is a possible, even likely outcome.

Using this construction suggests at least two things are occurring. First, and least importantly, individuals are using information in the decision making process about whether or not to trust others and government. Second, and of much greater importance, is that it is likely

that part of the information they are using is that background of life quality measured by my index.

CHAPTER 5: Quality of Life and Self Taxation

Citizens are occasionally asked to make specific policy decisions that elected officials are either unable or unwilling to make directly. Among the most common policies where specific voter approval is sought is the leveling of new taxes at the local level. Much has been made of the inability of citizens to make clearly rational decisions when faced with simple survey questions. (Campbell, Converse, Miller, & Stokes, 1960) If this view of the inability of citizens is correct, what does the average voter do when asked to make a decision about a specific policy issue?

If citizens are simply guessing when making these decisions finding consistent patterns that relate to theoretically important variables should be nearly impossible. It is these patterns that the political scientist seeks to find, validate, and test empirically. This study is no different, I identify a specific pattern that has the theoretic ability to explain how citizens decide tax issues placed before them on the ballot, and using election results from two hundred and twenty two counties, I test whether a discernable pattern of decision making can be identified.

Determining how members of the public develop and maintain opinions about political issues is a topic that has been hotly discussed. Despite the fact that many members of the public lack of information, lacking information does not prevent them from identifying how they feel about particular issues, particularly when they are asked to vote on a particular policy outcome. Citizens have opinions and can identify what they dislike, if not why they dislike it. This model of public opinion mirrors the literature's assertions about how individuals process information, are able to use that information in making decisions, and how they identify preferred policy outcomes.

One school of thought asserts that voters lacking information are unable or unlikely to gain information and therefore answer questions about policy through a process little better than random guessing. (Converse, 1964) Converse and others correctly identify a tendency of respondents to answer policy questions even when they lack specific information about the policy in question. (Campbell, Converse, Miller, & Stokes, 1960) These authors laid the groundwork for a discussion of both why respondents answer in this way, and a larger discussion about how respondents reach conclusions without all the information. A review of the literature makes it apparent that something more than random guessing is occurring; respondents are utilizing decision strategies that draw on the limited information they have to answer questions when asked (Popkin, 1991). That members of the public attempt to use information when considering public policy, leads directly to a consideration of how that information is used and what influences its use.

John Zaller (1992) in, "The Nature and Origins of Mass Opinion", proposes that opinions held by individuals are based on pieces of information that have become salient to them as they interact in the world each day. As individuals are faced with situations where decision making is necessary they draw on what information is available. Decisions are made and information is used based on prior experience, saliency, heuristic value, and other factors that draw pieces of information to the front of an individual's mind. In this model of decision making, the idea that individuals are merely guessing as suggested by Converse, or are minimally using information as suggested by Popkin, is replaced with information intensive processes where the individuals rely on a relatively large amount of information to make decisions. The provision and reception of that information by individual is paramount in this model. Zaller's model of how information is gathered, received, and evaluated on an individual basis asserts that information is received,

considered in light of other information, and filed away for future consideration. Thus the individual faces a similar situation when the information is available, as they consider how to respond to the new situation.

Working from a Zaller-esque model, which asserts that previous information should have an effect on future decision-making, some have proposed that rather than simply retaining all of the necessary information, individuals utilize heuristic devices which allow them to interact with the relatively large amount of previous information in a way that is both systematic, and parsimonious. Given the relatively large set of studies including several of those already discussed which call into question the ability of individuals to retain even relatively small amounts of information these heuristic devices are of particular importance.

The importance and the ability of heuristic devices to achieve this goal and improve the use of information, has been widely tested. While the results of these tests have been mixed, (Kuklinski, & Quirk, 2001) they do however provide some basis for believing that if the heuristic that voters use is correct, strong enough to override other information, is providing the correct information, and is applied in the proper context, it can lead citizens to use information both parsimoniously and systematically to reach the correct outcome (Lupia, 1994).

Given the potential of heuristic devices to provide citizens with a relatively low cost decision making strategy, the question that immediately arises is what is the correct heuristic device? Again the literature has provided a plethora of potential options. These options have can be understood first, as types of processes that can be used to reach decisions, and second (Lau & Redlawsk, 2006) specific cues and cue-givers that provide the information necessary within those processes (Rahn, 1993; Taber & Lodge, 2006; Goren, 2005).

Understanding the basics of the processes is important to any study that attempts to consider how citizens make political decisions, particularly when those decisions are specific policy choices presented at the ballot box. Using Lau and Redlawsk's (1997) basic divisions to consider these processes and some of the specific heuristic devices that are brought to bear in their use, provides information about how political decisions are reached.

The first potential strategy, which while not a true heuristic device per se, is important as the remaining strategies deviate from it; is simply the use of memory, this approach has alternatively referred to as rationality or rational choice decision making. Citizen's sort and store specific information about particular policies for use in the future, and retrieve and use the information when necessary. Political Science has a long tradition of placing citizen decision making into this framework; often models of voting are based on retrospective considerations that are necessarily premised on using memory in this way (Fiorina, 1981). Converse (1964), and Campbell et al. (1960), as well as most of the other authors writing in this area call into whether this approach to information processing is either accurate, or possible.

Indeed the accuracy and use of memory has been the subject of much discussion in the psychological literature, and a number of errors in memory have been identified that are particularly damning to this model of citizen decision making (Schacter, 1999). Research in this area finds that memories are likely to be based on preconceptions, selective use of information, and factually inaccurate. Given these problems expecting that citizens will make correct decisions primarily on the basis of specific retained facts seems extraordinarily unlikely.

The first of Lau and Redlawsk's (1997) alternative information processing constructions remains based on retaining particular information, but acknowledges that information that has been previously adopted into an individual's cognitive process is more likely to be used and used

effectively. The process that Lau and Redlawsk refer to as Early Socialization/Cognitive Consistency is closely aligned with the proposals of Converse (1964), Campbell et al. (1960), and Zaller (1992). One of the practical realities of this approach is that partisan identification which has long been identified as a determinant in the political decision making of citizen. This approach is likely one of the political heuristics used by individual citizens and has been ingrained in the cognitive processes citizens use to make political decisions at a relatively early age (Goren, 2005).

The next model identified by Lau and Redlawsk (1997) is what they term "Fast and Frugal Decision Making". This approach which is premised on a limited search for information necessary to make decision making has been operationalized by a number of authors, and asserts that rather than retaining the specifics of any particular instance of information individuals use information when it is freshest to evaluate both the credibility of the information, and that information applies to a myriad of considerations either immediately or in the future. (Lodge, et al., 1995)

Like "Fast and Frugal Decision Making", bounded rationality is premised on limited information seeking, but unlike the previous methods is not explicitly connected to the use of memory to reach a decision. Instead by using this approach citizens select both the type information they are looking for, and how to use that information based primarily on the decision that is to be made. Once they have identified the necessary information, they apply it to the decision using any one of a plethora of heuristic devices in a near unconscious process. (Lau & Redlawsk, 2006) In short this approach is differentiated form the "Fast and Frugal Decision Making" because it does not require an active decision making strategy to apply the heuristic to the decision at hand.

Since bounded rationality requires no specific cognition to select the decision process, understanding the heuristic devices that can be automatically applied can provide insight into the decisions made by citizens, including those at the ballot box. These heuristic devices have been well studied by a variety of authors, and have real implications for the potential outcomes of ballot propositions where opinions can become policy directives.

One of the likely starting places for understanding how heuristic devices can alter ballot decisions is through the use of emotion or affect. Much has been made of the ability of emotive decisions to lack rationality. Clearly affect towards a specific policy outcome has the potential to serve as a heuristic device (Rahn, 2000). In particular the effects of anxiety or anger might be of particular importance to a policy decision that has been framed in a particularly negative light. Huddy, Feldman, and Cassese (2008), find that there is a differential response to anxiety, over anger. The former increases the reliance on partisan and other heuristic devices, while anger leads to more use of cognitive processes. Like affect, values have been suggested as a potential decision strategy that shortcuts longer and more complex process (Feldman, 2003).

Potentially, the most important of the heuristic devices, is the use of motivated reasoning. Motivated reasoning, as described in the literature, suggests that individuals have specific, previous preferences, and engage in reasoning processes that are influenced by the previous preferences. (Jost, Glaser, Kruglanski, & Sulloway, 2003; Taber & Lodge, 2006) This is most clearly visible when there are repeated iterations of similar decision making. This process essentially shortcuts the decision process by substituting prior preferences for current information about the specifics of time and place. This approach, while certainly parsimonious and systematic, may or may not lead to the correct selection (Rahn, 1993; Redlawsk, 2002).

What seems clear given each of the potential processes for decision-making is two-fold. First, citizens unlike Converse's model do actually use information, and second that that information is likely wrapped up inside a heuristic device. The larger literature on the subject underscores the importance of understanding potential heuristic devices that deliver this information.

One of the objections that can be raised to the use of heuristic devises is that they lose important information that the average citizen is likely use when making political decisions. Heuristic devices are clearly important and relatively accurate descriptions of how citizens make political decisions. However, including those at the ballot box, and operationalizing and explaining the heuristic device researchers may in fact be losing some the information that is actually contained in the device as it is used by individual citizens.

I suggest an alternative heuristic device that citizens may be using to make political decisions, particularly ballot measures regarding taxation, namely their quality of life. Defining what is meant by quality of life is of paramount importance, most measures that attempt to measure quality of life have primarily associated it with the economic conditions that an individual experiences, however a large literature has established that quality of life is not merely economic conditions for the individual although that is an important consideration. Quality of Life must also consider other aspects of daily life that extend beyond the economic realm. (Henderson, Lickerman, & Flynn, 2000)

I expect that for areas exhibiting higher quality of life, it will be easier to pass ballot measures regarding taxation. This central research focus is rooted in social capital literature that indicates where social capital is higher, citizen involvement and cooperation is likewise higher. (Putnam, 2000) I specifically test a series of hypotheses that lead to a clearer answer about the

effect of quality of life on decisions to cooperate as measured by agreement with tax issues placed on the local ballot.

H1: Measured Quality of Life will have an identifiable effect on the likelihood of a tax increase ballot measuring passing.

H1A: Higher measured Quality of Life will have a positive effect on the likelihood of a tax increase.

H2: Higher measured quality of life will, have an identifiable effect on the total number of yes votes cast in a ballot election even when the population of county is controlled for.

Again we turn to the predictions of the social capital literature for a theoretical foundation for this hypothesis. The literature predicts and some evidence seems to verify that higher levels of social capital have a positive effect on vote turnout. (Rahn, Brehm, & Carlson, 1999)

H3A-D: Each of the Components, Quality of Life Indicators will have an identifiable effect on the likelihood of a tax increase ballot measure passing.

Here we return to the theoretic justification earlier explained, as each indicator found in the Quality of Life index measures a distinct area of potential concern for the voting citizen.

Testing for the effect of quality of life requires an operationalization of what specifically we mean by quality of life, and how can it be measured. Defining quality of life is problematic, and numerous definitions have been advanced, I however return to the Calvert-Henderson Definition, which argues that quality of life can only be defined by considering what makes up the world we currently live in, and how that world could be better or worse from the current situation (Henderson, Lickerman, & Flynn, 2000). This approach has two benefits, first it is easily quantifiable by selecting specific parts of world that can be operationalized and considered, and second it seems to mirror how individuals intuitively consider the world. When

using this approach there are two ways of measuring quality of life, the first focuses on the perception of quality held by individual citizens, and second uses objective and clearly measurable indicators. This project is primarily interested in testing the effect of the second way of measuring quality of life on ballot questions about taxation.

In order to test the hypotheses of this project, I constructed a data set consisting of the ballot measures from 223 intermountain west counties from 2006 to 2008. I also collected a series of potentially relevant indicators that control for the demography and location of our counties of interest. A full list of these variables is found in Table 5.1.

Table 5.1
List of Variables

Quality of Life Score
Economic Development Score
Infrastructure Score
Health Score
Public Safety Score
Per Capita Income
Wilderness
Net Population Change
Net Migration
Population
Education Level
Violent Crime(per 1000)
Property Crime (per 1000)
Federal Expenditure
Household Size
Percent White
Percent Female

For a measure of quality of life, I calculated scores for each of four indicators, as well as an overall Quality of Life score. These scores are scaled from 1-100 in each of the indicators and

the final score both for the indicators as well as the overall score is calculated using an average of each of the component scores underlying it. This process equally weights both the sub-indicators in calculating the indicator score that are then is equally weighted in creating the overall Quality of Life score. An alternative approach to calculating these scores would require the weighting of the individual data based on some empirical belief about what does or should drive quality of life. Lacking that empirical evidence, I follow the example set by the Economic Freedom of the World Index (2005) and invite those who believe a different weighting is more appropriate to recreate the scores using the appropriate data.[1] (Gwartney, Lawson, & Norton, 2005)

To test H1 I ran a Logit regression using as my dependent variable each of the tax related ballot measures across the counties of interest coded as 1 when the ballot tax measure passed. The standard errors for each of the indicators were adjusted for the use of county level data that was combined with the election level data. I tested both the Quality of Life composite score alone (Table 5.2) and with the other indicators used to calculate the score (Table 5.3). The second Logit regression tests for the possibility that the effect of the overall Quality of Life score is important only in concert with the individual components measured individually.

[1] This data and the calculations used in scoring each of the relevant counties is available by contacting the author directly at ryanyonk@yahoo.com

Table 5.2:
Quality of Life-- Logit

			N= 882 Percent Correctly Classified 62.93% Pseudo R2 .0722
Variable	Odds Ratio	Robust Std Error	P Value
Quality of Life Score	1.068	.0429	.100*
Per Capita Income	1.000	.0002	.788
Wilderness	1.229	.3089	.412
Net Population Change	1.000	.0001	.146
Net Migration	.9998	.00004	.006***
Population	.9999	1.44e-06	.769
Education Level	.9895	.0192	.589
Violent Crime (per 1000)	1.1992	.0755	.004***
Property Crime (per 1000)	.9843	.07553	.129
Federal Expenditure	1.0001	.00001	.096*
Household Size	1.4825	.7018	.406
Percent White	.9883	.0135	.393
Percent Female	1.1303	.0933	.138
Federal Lands Percent	.9899	.0052	.053*

*significant at the .1 level **significant at the .05 level ***significant at the .01 level

Given the results found in Table 5.2 I find evidence for H1, and H1A. There is a positive significant relationship between the Quality of Life Score and the probability of yes outcomes on ballot tax measures. The results of this regression are reported as odds ratios so values above one indicate greater likelihood's and those below one indicate lesser likelihoods. My analysis indicates that Net Migration as well as the Percent of Federal lands in a target county have odds ratio's less than one which indicates a reduction in the likelihood that a tax measure will pass, and that Violent Crime measured per 1000 residents and Federal Expenditures have a positive effect on the likelihood of the passage of tax measures.

Table 5.3:
Quality of Life-- Logit with Indicators

			N= 882 Percent Correctly Classified 64.17% Pseudo R2 .0985
Variable	Odds Ratio	Robust Std Error	P Value
Quality of Life Score	6.08e-44	2.47e-42	.014**
Economic Development Score	1.11e+18	1.75e+19	.009***
Infrastructure Score	6.25e+25	6.35e+11	.014**
Health Score	1.09e+18	1.73e+19	.009***
Public Safety Score	1.37e-11	4.40e-10	.014**
Per Capita Income	1.000	.00002	.803
Wilderness	1.23	.3055	.404
Net Population Change	1.0001	.00004	.005***
Net Migration	.9998	.00003	.000***
Population	.9999	1.29e-06	.298
Education Level	.9792	.0193	.287
Violent Crime (per 1000)	1.189	.0791	.026**
Property Crime (per 1000)	.9901	.0102	.338
Federal Expenditure	1.00002	.00001	.026**
Household Size	1.4052	.6339	.451
Percent White	.9842	.0128	.222
Percent Female	1.1209	.0978	.191
Federal Lands Percent	1.66e+07	1.78e+08	.120

*significant at the .1 level **significant at the .05 level ***significant at the .01 level

Adding the component measures to the overall quality of life score makes two important changes to the hypothesis tests from Table 5.2. First the direction predicted by my hypothesis is reversed. A relationship between quality of life and the likelihood of passing a ballot tax measure exists, but controlling for the component effects, the overall likelihood is decreased. I find that the directional hypotheses for each of the component measures except Public Safety are

confirmed. While not significant in this model specification higher values in Public Safety seems to have a negating effect on how quality of life affects ballot decisions.

To test H3 A-D a serious of nine Logit regressions were run, plus the original all-inclusive Logit. One for each of the indicators alone, one for the indicators run together, and one for each indicator with the overall quality of life score included. I have included only the summary of results for each of these regressions in Table 5.4. This series of tests provides information that is useful in two ways. First the independent effect of each of the indicators is identifiable using this procedure, and second the interaction with the overall Quality of Life score should also be discernable using this procedure.

Looking at Table 5.4 several variables are immediately obvious as being robust across the variety of specifications, primarily Violent Crimes, Net Migration, and Federal Expenditures all have consistent effects in each of the ten Logit regressions. These consistent effects have interesting implications for future research but have not specific bearing on the hypotheses of this paper.

Table 5.4
Quality of Life Logit, Multiple Specifications

Model	1	2	3	4	5	6	7	8	9	10
N PCC Pseudo R2	882 63.27 .0775	882 62.13 .0728	882 63.38 .0764	882 63.49 .0813	882 62.70 .0849	882 64.74 .0789	882 62.81 .0818	882 63.72 .0776	882 62.81 .0818	882 64.17 .0985
Quality of Life Score	X	X	X	X	X	1.0416	1.1116**	1.0452	.9577	6.08e-44***
Economic Development Score	1.0474*	X	X	X	910791	1.0330	X	X	1.160	1.11e+18***
Infrastructure Score	X	.9887	X	X	.9906	X	.9635	X	X	6.25e+10**
Health Score	X	X	1.030	X	89544	X	X	1.0156	X	1.09e+18***
Public Safety Score	X	X	X	1.112**	1.51e-18	X	X	X	X	1.37e-11
Per Capita Income	1.0001	1.0001	1.0001	1.0001	1.0001	1.0001	1.0001	1.0001	1.0001	1.0001
Wilderness	1.1250	1.2070	1.2452	1.1634	1.1555	1.1543	1.1395	1.2362	1.1393	1.2302
Net Population Change	1.00008*	1.00006	1.0001	1.0001*	1.0001**	1.0001*	1.0001*	1.0001	1.0001*	1.0001***
Net Migration	.9998***	.9998***	.9998***	.9998***	.9998***	.9998***	.9998***	.9998***	.9998***	.9998***
Population	.9999	1	.9999	.9999	.9999	.9999	.9999	.9999	.9999	.9999
Education Level	.9934	.9941	.9870	.9844	.9831	.9905	.9837	.9872	.9837	.9792
Violent Crime (per 1000)	1.188***	1.2175***	1.2216***	1.206***	1.2036***	1.1878***	1.2117***	1.2085***	1.2117***	1.1898***
Property Crime (per 1000)	.9875	.9839	.9816*	.9836	.9848	.9866	.9833	.9829*	.9833	.9901
Federal Expenditure	1.0002**	1.00002**	1.00002*	1.00002*	1.00002*	1.00002*	1.00002*	1.00002	1.00002*	1.0002**
Household Size	1.4871	1.3355	1.4706	1.6456	1.7906	1.6675	1.6679	1.5087	1.6675	1.4053

Percent White	.9891	.9868	.9866	.9876	.9887	.9871	.9871	.9876	.9870	.9842
Percent Female	1.1574*	1.1282	1.1064	1.1210	1.1289	1.1177	1.1177	1.1176	1.1177	1.1206
Federal Lands Percent	.9948	.9957	.9959	.9605**	866201	.9503*	.9863**	.9919	.9503*	1.66e+07

*significant at the .1 level **significant at the .05 level ***significant at the .01 level

H3A-D are confirmed only for Economic Development scores and Public Safety. Heath and Infrastructure return insignificant results. These results are the classic definition of mixed. We find support in part and non-support in part as well, clearly the indicators have potential predicative abilities with regards to ballot tax measures but only two of the four tested do so independently.

I then tested the indicators that compose quality of life in concert, and found no significant relationships, meaning that there is no gateway effect that requires the presence of the other indicators. I then tested each of the indicators with the overall Quality of Life score, and again the results are disconfirming; none of the individual indicators are significant even in the presence of the large Quality of Life score. Given these results we return to the fully specified Logit model that includes each of the indicators as well as the overall Quality of Life score. As discussed earlier we find that each of the indicators, excluding Public Safety, as well as the overall score, are significant. Given the totality of the results from the series of regression it appears likely that the relationship between the indicators and the overall score is necessary for the indicators to return significant results. Given Figure 1, this result is not surprising Quality of Life alone returns a significant result, and adding the composite measures is likely to return significant results.

What is somewhat more puzzling is the change in direction of the Quality of Life score, however it seems apparent that by including the composite indicators we have parsed out the effect of the indicators and those indicators are explaining the positive variation, and with those things held equal higher values of in the Quality of Life score runs in a direction counter to H1A. This does not necessarily disconfirm H1A out of hand. The goal of including a Quality of Life indicator is primarily to add information that individual citizens might use when deciding how to vote on a specific ballot measure, and as such it is done holistically, not with the variables in isolation. Future studies should consider the possibility that the purpose of the ballot tax measure might activate a different weighting scheme than that used in this model, and might make one of the indicators more important than the others.

My second hypothesis proposes that not only can quality of life have an effect on the outcome of elections but that it can also motivate individuals who support the tax increase to turn and vote in the election. Testing this proposition is relatively straight forward, using a standard OLS regression clustered by county I use the number of yes votes on each of the ballot measures as the dependent variable while controlling for both population and total votes cast, I estimate the effect of Quality of Life on the number of supporters who vote in the ballot election. The results are found in Table 5.5.

Table 5.5
OLS Total Yes Votes Regression

			N= 883 F= 1042.37 Prob > F=.000 R-Squared .9125 RSME 16403
Variable	Coef	Robust Std Error	P Value
Quality of Life Score	-44.506	79.4348	.576
Total Votes Cast	.5363	.0430	.000***
Per Capita Income	-.0293	.05141	.569
Population	.0002	.0175	.992
Wilderness	837.857	445.5956	.061*
Net Population Change	.826	.6482	.204
Net Migration	-1.0773	.6549	.101
Education Level	-60.6487	46.43013	.193
Violent Crime(per 1000)	76.7446	137.5841	.578
Property Crime (per 1000)	7.3438	20.3351	.718
Federal Expenditure	.0318	.0165	.056*
Household Size	-3932.405	1517.931	.010***
Percent White	-33.2498	16.4762	.045**
Percent Female	39.7491	71.8741	.581
Federal Lands Percent	.1074	9.645	.991
Constant	17674.87	11257.56	.118

*significant at the .1 level **significant at the .05 level ***significant at the .01 level

The results from Table 5.5 indicate that the null hypothesis cannot be rejected for H2, and as such H2 is not confirmed.

Given the relatively large number of hypotheses tested in this study, summaries of the results are found in Figure 6. Looking across each of the hypotheses tested we find that when Quality of Life is considered alone it does have an effect that confirms my hypothesis, again when considered alone we find that the direction of the effect is consistent with our theoretical understanding how social capital operationalized as Quality of Life might influence the decision to vote for ballot tax measures. However when considered with the composite indicators the

directional hypothesis fails as the direction of the effect is switched. As discussed above, this change in sign is not particularly distressing as the goal of quality of life, as tested in this study, is a full information measure not mitigated by its component parts. Given that goal, the results of the hypothesis test seem to indicate that at some level individual citizens may be using quality of life as a potential heuristic as they make decisions at the ballot box.

This reality is confirmed when average education across counties is considered; in no case does education have a significant effect on the outcome of ballot measures increasing taxes. Clearly something other than knowledge is in play as citizens make these decisions. Given the relatively low R2 the results do not conclusively indicate that Quality of Life is the decisive factor, they do however indicate that the Quality of Life as measured in this study has a measurable and significant effect on the outcome of a ballot measure increasing taxes.

Table 5.6
Summary of Hypothesis Tests

Hypothesis	Description	Confirmed?	Comment
H1	Quality of Life will have an identifiable effect on the likelihood of a tax increase ballot measuring passing.	Yes	Confirmed Independently and in concert with the indicators.
H1A	Higher measured Quality of Life will have a positive effect on the likelihood of a tax increase.	Yes No	Yes when considered independently No when considered with the indicators
H2	Higher measured Quality of Life will, have an identifiable effect on the total number of yes votes cast in a ballot election when population is controlled for.	No	No relationship exists
H3	Each of the Components, Quality of Life Indicators will have an identifiable effect on the likelihood of a tax increase ballot measure passing.	Mixed	2 Indicators have independent effects
H3A	The Economic Development	Yes	Alone

	indicator will have an identifiable effect on the likelihood of a tax increase ballot measure passing.	
H3B	The Health indicator will have an identifiable effect on the likelihood of a tax increase ballot measure passing.	No
H3C	The Infrastructure indicator will have an identifiable effect on the likelihood of a tax increase ballot measure passing.	No
H3D	The Public Safety indicator will have an identifiable effect on the likelihood of a tax increase ballot measure passing.	Yes

My other hypothesis do not fare as well as H1 and H1A, H2 that proposed an increase in voter turnout supporting the ballot measures was not confirmed, and seems to indicate at least in this case the absence of a relationship between Quality of Life and the decision to vote. This result while somewhat disappointing should not have been unexpected; while the social capital literature seems to indicate that a relationship might exist, the relevant literature that tests this proposition is surprisingly scarce, and clearly more research is needed in this area to flesh out the relationship.

My final hypothesis returned mixed results; ideally each of the individual indicators would have had a relationship with the outcome. While this ideal was clearly not met, two of the indicators do return significant results, and should be considered. Both economic development and public safety, which have a long history of being important to voters do have an identifiable effect on ballot measures increasing taxes, in both cases the odds ratio's indicate that the higher the score on both indicators the more likely individuals are to cooperate on taxation issues at the ballot box. It is possible that these two indicators that were related to the ballot propositions

specifics, and may be identifying the underlying preferences of the citizens in counties where high indicators scores in these areas were found.

Quality of Life as measured in this study has an effect on citizen decisions about whether to vote for or against a ballot measures increasing taxes, and given the literature on how citizens reach these types of decisions, it seems likely that Quality of Life may be being used as a heuristic device as citizens make decisions regarding these measures. Given the results of this study, it appears that using a fuller information heuristic like Quality of Life has the potential to better capture how decisions are being made without the necessity of losing nearly all of the information that citizens intuitively use to make decisions.

If citizens were simply guessing as has been suggested by some, identifying a pattern of passage that is related to quality of life would be nearly impossible to do. Instead using Logit regression to consider the passage of individual ballot measures I find a pattern of results that is statistically related to quality of life and in that pattern is evidence that citizens are using an information process that appears to consider quality of life as they decide how to vote on ballot measures that increase their own taxes.

CHAPTER 6: Quality of Life and Direct Democracy

[2] The ideal of direct democracy was the incorporation of citizen preferences into public policy. However, there have been changes to the direct democracy system – the inclusion of professional petitioners, interest groups and political parties into the system leaves questions about whether it represents the will of the people. These changes are reflected in the participation and quality of referenda and initiatives in the past decade. Our research examines ballot measures and quality of life to determine the effects that quality of life has on participation.

Citizens have choices when participating in a democracy. Hirschman (1970), the leading scholar on citizen choices in the democratic system stated that citizens exercise their options to voice their concerns or exit public discourse. We extend this to look at direct democracy as one of the most engaging components of citizen participation. By considering the decision to use a vote as a voice by analyzing participation in direct democracy and whether participation in specific direct democracy measures is driven by interest and engagement in those policy areas, we find that citizens who have higher quality of life have a deeper engagement in the direct democracy process.

Quality of Life

In a world where differences in geography no longer limit knowledge of other places, people and societies are increasingly comparing their quality of life to others in various areas. It is natural to notice a difference of conditions between areas and those observations can motivate

[2] "Chapter Six is the Product of a Collaboration with Shauna Reilly and has in large part been accepted for publication in Applied Research in Quality of Life. As such References to We should in all cases be construed to acknowledge joint effort and collaboration"

and inspire the adoption and integration of ideas and policies that work while discarding those that do not.

A working understanding of quality of life is important to understanding the implications of public policy. The concept of quality of life and its measurement is frequently discussed and debated among scholars of various fields and while there are a variety of positions advocated by various disciplines, there appears to be an emerging consensus regarding its importance in understanding modern society.

Scholars of economics, sociology, political science and social psychology have all attempted to define and effectively quantify their definitions of quality of life to make meaningful observations of society and to formulate optimal policy prescriptions. Milbrath (1979) states that quality of life information is a useful policymaking tool because it can: "identify predicaments, provide value weightings, infer prospective project impacts, assess project outcomes,…suggest alternate lifestyles, (and) alert leaders to growing disaffection" (p. 32). Campbell (1981) quotes Lyndon B Johnson on the subject,

> The task of the Great Society is to ensure our people the environment, the capacities, and the social structures which will give them a meaningful chance to pursue their individual happiness. Thus the Great Society is concerned not with how much, but with how good- not with the quantity of goods, but with the quality of our lives (p. 4).

The literature on quality of life is vast and touches many areas of interest; unfortunately, it has failed to connect the overlapping indicators and methods from the various fields with each other to achieve a consensus on the definition of quality of life and how to measure it. Using the numerous approaches to the definition and subsequent measurement of Quality of Life, while attempting to understand their underlying differences, and similarities, we focus on the effect of quality of life has on the political realm.

One of the central debates in the literature revolves around whether the indicators used to measure quality of life should be "subjective" or "objective" in nature. The objective approach based on aggregate population data have been advocated by such measures as the United Nations Development Program (1998) in their Human Development Index, and the World Bank (2009) in their World Development Indicators. They use quantifiable aggregate measures of economic, social, health or other indicators to gauge the quality of life for a given population. On the other hand, subjective measures such as those advocated by Brooks (2008) and Gill (1995), place the measurement of quality of life in the realm of satisfaction and overall happiness, which is only definable by the individual, and is measured by surveys.

We assert, however, that Costanza et al. (2008) rightly deduce that these differences between the two types of measuring are not as deep as they appear. They claim that these "so-called "objective" measures (of quality of life) are actually proxies for experience identified through "subjective" associations of decision makers;" and thus "the distinction between objective and subjective indicators is somewhat illusory" (p. 18).

Building from Costanza et al.'s assertion we use an index of Quality of Life rooted in objective measures. A properly constructed index has three key properties that are of particular value to our task. They are reliable, scaling data together for various observations using a set of rules, and using those same rules, with the same data gets identical scores. This makes the indexes reliable and comparable. Finally and most importantly to the scientific method, these indexes are repeatable, they use data and must define what data is included, and how that data is scaled together future researchers can replicate the study using identical data, or new data using the same scaling rules.

We constructed our index of Quality of Life using this approach. Our first interest was creating a reliable index, and to do so we needed a strong set of rules that we could follow when scaling data into a final score. A number of systems of rules are available which meet the requirement of reliability. Two types of systems were of particular interest to us. The first incorporated a weighting scheme for variables and indicators to allow for differential effects into the scaling rules. The second does not weight the included variables or indicators, leaving each variable or indicator to affect the index in equal ways; thus, providing the strength of measurement by including all of these indicators equally. We use the second approach, which is also used by the United Nations Human Development Index, the Economic Freedom of the World Index and a number of others. We made this decision primarily due to limits in the underlying theory of quality of life.

Direct Democracy

When discussing participation in direct democracy that participation is often framed in terms of participation in other elections. Direct democracy elections are subject to the same problems for turnout as other elections (such as information, salience, and turnout, etc.) but they also provide an additional dilemma to the electoral agenda as the repercussions of these elections can be substantial and their salience low. Another important change in voting behavior that affects direct democracy is the growth of issue voting (Nie, Verba, & Petrocik, 1979). Issue voting has led to votes focused on specific issues rather than relying on partisanship, which has a positive impact on participation in direct democracy as it suggests that issues are motivation for voting or can set the agenda for other elections (Nicholson, 2003; 2005).

Direct democracy has also been accused of complicating the ballot; further supporting the idea that citizens are not knowledgeable about direct democracy proposals (Schmidt, 1989; Magleby, 1984; Lipow, 1973; Pillsbury, 1931). Studies have attempted to connect citizen's lack of education with participation on complex and technical issues (Magleby, 1984) demonstrating that only some opinions are represented through direct democracy. This can be connected with the quality of life in an individual state. This is further examined by looking at the electoral situation. National elections have more salience and it must be expected that these different levels of turnout affect participation on statewide propositions (with low salience in regards to elections higher up the ballot). Explanations such as information environment (Nicholson, 2003; 2005), topic (Nicholson, 2005), media coverage (Bowler & Donovan, 1994), race (Magleby, 1985; Darcy & Schneider 1989; Vanderleeuw & Engstrom, 1987), length of ballot (Walker, 1966; Taebel, 1975; Brockington, 2003), language (Magleby, 1985; Reilly, 2010; Reilly, & Richey, 2008), and characteristics of the election (such as electronic counting machines Nichols & Strizek 1995; Nichols, 1998) have been explored as reasons for decreased participation on ballot measures.

Because ballot measures are coupled with complex and technical issues of direct democracy with none of the traditional cues of regular elections (Magleby, 1984), such as political party cues (Lee, 1960; Hawley, 1973; Schaffer, Streb, & Wright, 2001) participation on these measures is suppressed. These combine to make participation difficult on ballot measures. Further, there is evidence that voters experience fatigue even in the presence of heuristics to cue the public about voting preferences when there are long ballots (Kimball & Kropf, 2006; Brockington, 2003; Nichols & Strizek, 1995; Nichols, 1998; Darcy & Schneider 1989; Magleby, 1984; Taebel, 1975; Walker, 1966). Ballot fatigue from a lengthy and difficult questions or

topics (Magleby, 1984; Reilly, 2010) have been found to decrease turnout. In fact, Magleby's research goes beyond that previously discussed to focus on voter fatigue – demonstrating the roll-off from the top of the ballot to lower races on the ballot in California, and predicts that lengthy ballots are a plausible explanation for decreased participation.

When studying the complexities of ballot measures it is important to acknowledge how the ballot influences participation as well as vote choice. Vote choice is influenced by the ability of voters to not only develop preferences on these policy issues but also how they translate that into votes on election day. When the ballot is more complex or deals with highly complex issues voters are less likely to vote consistent with their policy preferences (Reilly, 2010).

The more people know about ballot propositions and elections the more likely they are to participate in those elections. Bowler and Donovan (1994) investigate information and opinion change concerning ballot propositions. They suggest that the increase in mobilization of opinions on ballot propositions is directly related to the increase in knowledge about these propositions. This means that voters who do participate on ballot measures are more likely to have higher levels of knowledge in regards to these measures. The high percentage of voters who have no opinion, are potential roll-off votes, and a decrease in ballot roll-off comes from being more educated through campaign exposure.

When looking at socioeconomic characteristics—the closest that the literature comes to quality of life and its impact on direct democracy—previous studies indicate that education and race are important considerations in who participates in direct democracy elections (Branton, 2003; Vanderleeuw, & Engstrom, 1987). This seems to propose that these elections are only for the elite. Therefore, the power of the people, which is sought in these elections, is indeed limited by them. Another assumption that is contradicted throughout the literature illustrates that it is not

big business that is the focus of these measures but rather individuals pursuing their interests (Matsusaka, 2004; Gerber, 1999).

Theory

The ideal model of democracy requires that citizens participate and are engaged in every aspect of political society. Our understanding of citizenship in the United States is slightly different as citizen participation is at an all time low, yet citizen contributions to policy are on a rise through direct democracy measures. Ballot measures are the only measures in the United States that allow citizens to vote directly on policy choices. They are either proposed by the legislature or the citizenry and affect the future of state governments. With these elections being so pervasive in the past decade, it is a timely issue to discuss. We take this further to demonstrate that quality of life has an effect on how direct democracy elections are decided.

We theorize that in states with higher quality of life citizens will choose participate in direct democracy elections more frequently than those with a lower quality of life because they have more invested in the outcome of the process. Furthermore, we theorize that in those states with higher quality of life ballot measures will pass with greater ease than in those with low quality of life because they want more direct influence over the policy decisions in the state.

A competing theory however is that states with higher quality of life will participate direct democracy elections less frequently, and be less willing to pass direct democracy measures than those that have a lower quality of life because they are more satisfied with the current policy agenda. We test which of these competing explanations and in combination, to determine which of the theorized effects of quality of life are correct.

However because measures of quality of life are aggregate measures that assign quality of life scores to geographic areas, our study calculates those scores on the state level in order to comply with state level voting and petitioning of direct democracy. As individuals are not asked about their participation in the process, we can only interpret the findings at the state level. However, our findings indicate that there are indeed correlations between state levels of quality of life and participation in direct democracy elections.

Hypotheses

Our theory lends itself to two types of hypotheses about the affect of quality of life on direct democracy measures. The first directly examines the effects of quality of life on voter participation in direct democracy elections. Our main hypothesis about voter participation in direct democracy elections is: states with high quality of life will have higher turnout in direct democracy elections than those with low quality of life. We also test two alternative hypotheses to test our alternative theory: states with high quality of life will have lower voter turnout in direct democracy elections than those with low quality of life. This hypothesis is direct test of the alternate theory we discussed above, and is mutually exclusive with our first hypothesis, meaning any confirmation of either discounts the underlying theory for the other. The second alternative is the null hypothesis; that in fact both theories are incorrect, or given our data we cannot find a relationship between quality of life and voter turnout in direct democracy elections.

The second set of hypotheses test whether quality of life affects the passage of direct democracy measures. Again our main hypothesis states that with high quality of life direct democracy ballot measures will be more likely to pass than in states with low quality of life. Again, we test two alternate hypotheses: states with high quality of life direct democracy ballot

measures will be less likely to pass than in states with low quality of life. Another alternative is a null hypothesis, is that in fact both theories are incorrect, or given our data we cannot find a relationship between quality of life and ballot measure passage.

Methods and Data

We use data on ballot measures from 2006-07 and Quality of Life measures for the same period. Our analysis draws on constructed Quality of Life measures and combines them with voting measures to demonstrate the impact of aggregate life quality on aggregate policy goals, as well as how those goals translate into participation in and passage of direct democracy elections.

Our index of Quality of Life has five indicators: Public Safety, Health, Economic Development, Infrastructure, and Education. Using our established methodology, we calculated scores for each of these indicators and finally an overall Quality of Life score. This is developed from the literature, and as our understanding of these areas differs, each indicator has variable number of component pieces from a single variable in Public Safety to over a dozen in Economic Development. In each case, we used literature on quality of life as to determine what those component pieces should be. For example, our original conception of Public Safety included a large number of variables that measured different areas of crime, but after further review of the literature and the testing for scalability with the other indicators this did not add information about quality of life. Rather, we found that the funding effort for each state was a better predictor of quality of life than the outcome of crime. A more detailed discussion can be found in the forthcoming report "Quality of Life in the Rural West" from the Institute of Public Lands and Rural Economics.

Building from our preference for open data availability, we use only publically available data, from two sources. Our primary source is the 2005 mid census estimates for all US states, and our secondary source is the National Center for Educational Statistics. This data is commonly available free of charge from the United States Census website, or the NCES website. In Appendix One, we include the census codes of the variables we used to aid replication and verification of our index. The end use of our index of Quality of Life is not simply to enable a rank ordering state, we selected rules that would provide a unique score for each state, and could be used in future statistical projects. Further, following earlier discussion of comparable indexes, we designed our index primarily to maximize variation and comparisons between observations. We determined that because we were interested in the full universe of the United States our primary interest was in comparability within that particular group.

We followed a three-step procedure to scale data into our index. For each variable we converted the actual value to a scale from 0 to 1. To accomplish this scaling we used the well tested and verified metric of the United Nations Human Development Index. This method is uses the maximum observed value, the minimum observed value, and the actual observed value for each observation to scale the data. The basic formula is . Using this scaled value, which represents where each observation falls within the full universe of US States, allows for direct comparability within our data set without any further calculations. We know that a value of 1 is the maximum value, and a value of 0 is the minimum value, and between those values lies most of our observations. Because we convert each variable to this scale we are no longer measuring the actual results of a particular variable but rather the states score in relation the maximum and minimum observed for that value.

As we have scaled the variables to a ranking we can aggregate the values using simple averages, and for each sub indicator we aggregate those values by taking an average of the states core on each of the variables we include. Using the average of the sub indicators we can then calculate the value over the overall indicator using the same mechanism. Then we aggregate and rescale to achieve a final score that ranges from 0 to 1. Using this calculated value we then calculate our final quality of life score. Again, we aggregate the indicators and rescale to achieve a final quality of life score that ranges from 0 to 1. This final scaled result is the quality of life score for each state.

Ballot Measure Data

The ballot measure data was collected from 1998 to 2008. This included all ballot measures that appeared on a ballot during this period of time. The data we used is part of a larger dataset that included details on the readability, position and data about the ballot measure itself (Reilly, 2010). The main focus of our analysis is participation and vote choice. Participation is determined by looking at roll-off on each individual ballot measures, which is calculated by using the percent difference from the number of votes for the top office on the ballot to the number of votes on individual ballot measures. Ballot roll-off indicates that citizens vote for a top office but do not complete the entire ballot. The top offices varied from Governor, Senator or House of Representatives depending on the state and year. In addition, details such as how many voters cast votes for or against these ballots were obtained from this dataset. The original dataset was developed by contacting the Secretary of States' offices for each state and their electronic archives.

Tests and Results

Because our first set of hypotheses are all mutually exclusive propositions we use a single statistical model to test them. To do this, we regress quality of life on voter turnout percentage while including controls for other explanations of voter turnout. The results of this regression included in Table 6.1, clearly indicate that independent of other variables that might explain voter turnout in direct democracy elections our Quality of Life index is a statistically significant predictor.

Table 6.1
Voter Turnout - OLS
Observations 310
R-Square .5163

Variable	**Coef**	**Robust Standard Error**	**P Value**
Quality of Life	**.2243**	**.0625**	**.000****
Percent Men	**.0001**	**.00002**	**.000****
Median Age	**.0039**	**.0033**	**.240**
Percent High School Grad	**-.0013**	**.0021**	**.542**
Percent College Grad	**-.0008**	**.0013**	**.528**
Unemployment Rate	**.0137**	**.0042**	**.001****
Median Income	**1.20e-07**	**8.31e-07**	**.885**
Percent African American	**-.0055**	**.0008**	**.000****
Percent Hispanic	**-.0019**	**.0006**	**.001****
Population	**-1.87e-09**	**4.57e-10**	**.000****

*significant at the .1 level **significant at the .05 level ***significant at the .01 level

The results from Table 6.1 clearly support our first hypothesis as higher quality of life returns a statistically significant positive coefficient. If our alternative hypothesis had been correct, we would have expected a negatively signed coefficient instead. Likewise, because a relationship is identified by the regression analysis we cannot confirm the null hypothesis proposition that no relationship exists. These results provide some confirmation of our theory. This demonstrates the power of quality of life on participation, the higher the quality of life, and

likely that where citizens have more at stake they are more willing to participate to protect/defend these qualities.

We test our second set of hypotheses using both linear and logistic regression to consider the effect of quality of life on ballot measure passage. The first tests for the effect of quality of life on generating 'yes votes', and the second on the actual passage of those measures. These results are reported in Tables 6.2 and 6.3. The strongest confirmation of our primary hypothesis would be positive and significant effects of quality of life in both regression analyses.

The results from the logistic regression and linear regression of 'yes votes', provides a divergent picture of the affect of quality of life than our earlier model. We find evidence that higher quality of life generates a smaller percentage of yes votes, and that passage of ballot measures is less likely in areas with higher quality of life. These results provide confirming evidence for the alternate theory.

Table 6.2
Votes for Ballot Measure - OLS
Observations 188
R-Square .8852

Variable	Coef.	Robust Standard Error	P Value
Quality of Life	**-2437328**	**886076.6**	**.007*** **
Percent Men	**39560.78**	**71888.52**	**.583**
Median Age	**-16425.09**	**26154.17**	**.531**
Percent High School Grad	**30955.38**	**19443.19**	**.113**
Percent College Grad	**19959.07**	**11961.33**	**.097***
Unemployment Rate	**52396.58**	**39589.6**	**.187**
Median Income	**5.9003**	**8.438**	**.485**
Percent African American	**54427.98**	**10644.33**	**.000*** **
Percent Hispanic	**3808.103**	**7579.43**	**.616**
Population	**.1183**	**.0115**	**.000*** **
Ballot Position	**4217.39**	**5130.71**	**.412**
Roll-off percent	**-1216100**	**513984**	**.019** **
Qualification Difficulty	**-24749.57**	**41184.45**	**.549**
Legislative Insulation Index	**62134.42**	**50243.75**	**.218**
Voter Turnout	**2553057**	**504463.7**	**.000*** **
Initiative Dummy	**-174887.8**	**97109.5**	**.073***
Legislative Referendum	**200012.2**	**97398.29**	**.042** **
Popular Referendum	**-184859.5**	**173418.5**	**.288**

*significant at the .1 level **significant at the .05 level ***significant at the .01 level

The results from Table 6.2 clearly support our alternate hypothesis as higher quality of life returns a statistically significant negative coefficient. If our primary hypothesis had been correct, we would have expected a positively signed coefficient instead. Likewise because a relationship is identified by the regression analysis we cannot confirm the null hypothesis's proposition that no relationship exists. These results provide some confirmation of the alternate theory we lay out above, demonstrating that quality of life means that voters are satisfied with their current form of government and prevent ballot measures that would disrupt the status quo.

However, direct democracy elections are about more than just accumulating 'yes votes', they are about the passage of ballot measures or at a minimum bring attention to issues. To

model this reality we conducted a logistic regression, and report the odds ratios for each variable. The results of this model are reported in Table 6.3.

Table 6.3
Ballot Measure Passage - Logistic Regression
Observations 188
Pseudo R-Square .2500

Variable	Odds Ratio	Robust Standard Error	P Value
Quality of Life	**4.80e-06**	**.0003**	**.067***
Percent Men	**1.52132**	**1.1701**	**.586**
Median Age	**.9293**	**.1647**	**.679**
Percent High School Grad	**.6835**	**.1084**	**.016****
Percent College Grad	**1.2811**	**.1326**	**.017****
Unemployment Rate	**1.3298**	**.3235**	**.241**
Median Income	**1.0001**	**.0757**	**.697**
Percent African American	**1.059**	**.0757**	**.423**
Percent Hispanic	**.8850**	**.0614**	**.078***
Population	**1**	**5.58e-08**	**.697**
Ballot Position	**.9914**	**.0282**	**.760**
Roll-off percent	**.0229**	**.0450**	**.055***
Qualification Difficulty	**1.5518**	**.5105**	**.182**
Legislative Insulation Index	**.8641**	**.3059**	**.680**
Voter Turnout	**.2095**	**.9228**	**.723**
Initiative Dummy	**1.3236**	**1.8637**	**.842**
Legislative Referendum	**7.7324**	**10.8659**	**.146**
Popular Referendum	**.2321**	**.4079**	**.406**

*significant at the .1 level **significant at the .05 level ***significant at the .01 level

The results form table three again clearly supports our alternate theory as higher quality of life returns a statistically significant odds ratio under one. If our primary hypothesis had been correct we would have expected an odds ratio greater than one instead. Likewise because a relationship is identified by the regression analysis we cannot confirm the null hypothesis's proposition that no relationship exists. These results confirm our earlier findings about citizen connections to the current government policies.

The results of our hypothesis tests indicate that both of the describe theories are operational with regards to quality of life. Decisions to participate in direct democracy elections

are clearly positively associated with higher qualities of life, however how citizens vote on those measures is clearly a function of our alternate theory, where those in higher quality of life areas are less likely to support changes in public policy through direct democracy. In the end we find that our first primary hypothesis, and our second alternate hypothesis are confirmed. These results provide a better indication of the effect of quality of life on political behavior, and provide a better understanding of when the divergent theories of the effect of quality of life are operational. We do an in-depth study of one of these high quality of life states to better understand why direct democracy is on the rise among all states when the tendency is for states with higher quality of life to reject direct democracy measures when they are presented.

Oregon: An In-depth Look

In further analysis, we look at petitioners of direct democracy measures and how quality of life contributes to their participation and desire for more citizen involvement in government policy. Using a survey of 96 petitioners in Oregon including basic socioeconomic questions as well as about the decision to pursue direct democracy measures, there is a clear relationship between higher levels of education and petitioning for initiatives. Only two percent of petitioners did not attended college and nearly 80 percent have graduated from college or a graduate program, expanding our understanding of who participates in the direct democracy process. Second, petitioners actively participate in their community and elections; demonstrating they want to influence government through voting for representatives as well as through petitioner and voting on ballot propositions.

Besides education, other socioeconomic issues are important to analyze to determine more about the petitioners and the role in the process. Looking at the age breakdown of

petitioners, older citizens primarily do petitioning with only 21 percent of petitioners being younger than 45 years of age. This, combined with educational and voting findings, indicates that petitioners represent higher amounts of voter features consistent with previous voting literature (Wolfinger, & Rosenstone, 1980). Consistent with the idea that petitioners are among the more active citizens in the state, the majority of petitioners indicated that they were active members in community groups. Based on the expectations of our society (Putnam, 1995; 2000), this demonstrates that petitioners are engaged citizens – not only in participation and education rates but also in their activism within the community. Through this analysis of Oregon, combined with questions about their socioeconomic status, we conclude that these citizens have a high quality of life.

This leads to questions about why petitioners propose measures. The following quotes are taken from petitioner responses to the surveys and provide evidence for this argument. Petitioners were asked why they proposed an initiative; quotes of their responses are below:

> "Other measures (legislatively) were ineffective."
> "Because the Legislature would not act."
> "High frustration level with partisan legislature that got nothing done. Public seemed ready to seriously consider public financing of elections as option. No success whatsoever in legislature for passing provisions through normal channels (legislative process) and availability of national money to run campaign."
> "The initiative process allows the majority of the voters to make a decision when one is not able to convince a majority of its representatives to pass their policy."
> "Because the legislature is unwilling to address the problem. In our state, the legislature is controlled by special interests that oppose the subject matter of our initiatives. As a result, we are forced to go out onto the ballot, where we typically prevail."
> "We use the titles to field test concepts which may be part of our legislative agenda, to intimidate the opposition, and to nudge the legislature to pursue good public policy."

These quotes illustrate the use of direct democracy as an alternative method to get attention to issues, make policy and that these citizens are willing to cooperate to solve perceived policy problems through direct democracy. And while we cannot connect the passage of this legislation with individual petitioners studied, we can discuss the reasons why citizen desire to petition. This desire by petitioners to be so involved in government is consistent with our finding about civic engagement and quality of life. It also demonstrates that while citizens have a role in bringing these measures to the legislature, they don't necessary have to power to pass them.

The Oregon case provides some interesting evidence for our larger theory, and tests the propositions of that theory in an arena where individual actors can be identified and considered. This consideration adds an important component that aggregate studies lack.

Our observations of petitioners in Oregon validate the general logic of our theory. Those who are actively attempting to place items on the ballot for direct democracy decisions do appear to be acting to protect or improve what they perceive as life quality issues. When asked, petitioners articulated exactly what we had expected, given our theory. They first pointed to deficiencies in areas of life quality, and posited a solution to those life quality issues in the form of a ballot proposition. Likewise because activists are often at odds with the median voter, a phenomenon easily observed among petitioners ballot, measures that do not resonate directly with the concerns of the median voter, or where the median voter has a preference for the status quo, are likely to fail. In areas with higher quality of life the alternate theory posits and our results confirm a distinct preference for the status quo.

Implications

Direct democracy is celebrated for its several effects on society. The effect of direct democracy measures demonstrates the positive influences of direct democracy, increased political and societal knowledge as well as increased engagement with society, and understanding what drives participation and choice in direct democracy elections is an important part of the story. Two of these effects have been researched substantively and increase quality of life where direct democracy is practices. First, educational effects controlling for race, gender, income, partisanship, media consumption, and political efficacy they find that citizens living in states with more exposure to ballot initiatives have greater political knowledge (Smith & Tolbert, 2004). Further, Smith (2002) finds that the presence of more salient ballot measures increases turnout in midterm years but not presidential. The second influence on quality of life is through civic engagement, where the ability to change policy through this mechanism directly increases civic engagement (Smith & Tolbert, 2004; Tolbert, McNeal, & Smith 2003). Engagement and knowledge comes from repeated exposure to information about measures available through the media and direct campaigns. By getting citizens involved and engaged in these elections it increases the importance of direct democracy and contributes to the notion of citizen influence on government policy.

Conclusions

Our findings explore the role of quality of life in the direct democracy process. Despite mixed results to our hypothesis test we find strong evidence that quality of life and direct democracy are at minimum a correlated phenomenon. Further we find that

participation in direct democracy is highest in states where there is a high level of quality of life. We also find that this participation does not result in passage of these measures, rather the opposite. Ballot measures are less likely to pass in states where there is a high quality of life. Our theory indicates based on these results that citizens turn out to maintain their status quo, or quality of life. Thus, rebuffing the effects of single petitioners who seek to alter the political and social landscape.

Quality of life and direct democracy have similar ideas and connotations, as it seems that when there is a high quality of life citizens desire to have more input into their government. However, from our findings we find that having more input leads to less passage of direct democracy measures, surely an important result. Building from these results it is clear that participation is higher in states with higher quality of life but participation is often to prevent change to the state policy structure.

Our findings expand the literature on direct democracy by examining the differences across states that accounts for participation and petitioning differences. This is a state level phenomenon that is often aggregated as a whole, but there are substantial influences that need to be examined at the state and local level. This research details the importance of citizens maintaining their status quo or quality of life, it explains why there may be some inconsistency between votes and policy choices as there are prevailing effects that may play a larger influence than just policy preferences. When a voter is happy with their status quo, they may choose to maintain that status quo rather than to vote to change policy – even when it's consistent with their policy preferences.

CHAPTER 7: Federal Spending and Quality of Life

Ronald Regan is famous for the claim that government is the problem not the solution. However this assertion flies in the face of most explanations of the development society, namely that governmental structures are a necessary and important part of organizing and improving society. The logic of government is that by collective action and governance individuals are made better off. This logic pervades nearly all modern justifications for the existence of the state has been explored primarily in theoretic evaluations of what government provides and the assumption that those goods would not be provided in the absence of government action.

In what follows we evaluate the effect of government action on the quality of life of the citizens governments are undertaken to assist. Using a newly developed Quality of Life index we regress county level quality of life on federal expenditures to test the validity of notion that government has the ability through its primary resource—the allocation of funding—to improve the quality of life of those it governs.

Quality of Life

Life quality is explored in the study of how different aspects of a person's life combine to create a level of utility or satisfaction. In an increasingly connected world where differences in geography no longer limit knowledge of other places, people and societies are increasingly comparing their quality of life to others in various areas. It is natural to notice a difference of conditions between areas, and in the aggregate it is helpful since it motivates and inspires the adoption and integration of ideas and policies that work while discarding those that do not.

A working understanding of the concepts and approaches to the study of quality of life is important to understanding the implications of public policy as designed and implemented by the

government. The concept of quality of life and its measurement is frequently discussed and debated among scholars of various fields and while there are a variety of positions advocated by various disciplines, there appears to be an emerging consensus regarding its importance in understanding modern society.

Scholars of economics, sociology, political science and social psychology have all attempted to define and effectively quantify their definitions of quality of life to make meaningful observations of society and to formulate optimal policy prescriptions. Milbrath (1979) states that quality of life information is a useful policymaking tool because it can: "identify predicaments, provide value weightings, infer prospective project impacts, assess project outcomes, suggest alternate lifestyles, (and) alert leaders to growing disaffection" (p. 32). Campbell (1981) quotes Lyndon B Johnson as saying:

> The task of the Great Society is to ensure our people the environment, the capacities, and the social structures which will give them a meaningful chance to pursue their individual happiness. Thus the Great Society is concerned not with how much, but with how good-not with the quantity of goods, but with the quality of our lives (p. 4).

The literature on quality of life is vast and touches many areas of interest; unfortunately, it has failed to connect the overlapping indicators and methods from the various fields with each other to achieve a consensus on the definition of quality of life and how to measure it. We analyzed the literature on the numerous approaches to the definition and subsequent measurement of quality of life and attempted to understand their underlying differences, and similarities, while focusing on the role that quality of life has on government.

One of the central debates in the literature revolves around whether the indicators used to measure quality of life should be "subjective" or "objective" in nature. Objective measures based on aggregate population data have been advocated by such measures as the UNDP (1998) in

their Human Development Index, and the World Bank (2009) in their World Development Indicators. They believe that the use of quantifiable aggregate measures of economic, social, health or other indicators are sufficient to gauge the quality of life for a given population. From government policies, we can see that much of governmental focus in on achieving these qualities for their population, in one manner or another.

On the other hand, subjective measures such as those advocated by Brooks (2008) and Gill (1995), place the measurement of quality of life in the realm of satisfaction and overall happiness, which is only definable by the individual, and is measured by surveys. These results can be statistically combined to draw conclusions about the aggregate population but their true significance rests at the individual level since responses can vary widely for numerous reasons.

While both of these different approaches have make contributions to the literature, we feel that when used independently they fall short of being sufficient for a complete understanding of the driving forces behind quality of life. One of the issues that seem to be at odds between them is whether to take a macro or micro perspective of the indicators.

We assert, however, that Costanza et al. (2008) rightly deduce that these differences between the two types of measuring are not as deep as they appear. They claim that these "so-called "objective" measures (of Quality of Life) are actually proxies for experience identified through "subjective" associations of decision makers;" and thus "the distinction between objective and subjective indicators is somewhat illusory" (p. 18)

We stress that since there can never be a truly objective set of indicators created, due to the fact that the very selection of some indicators and not others is subjective, the fundamental argument of quality of life literature should revolve around the nature of the quantitative data

that is used in the justification of subjective indicators and not around if they are used at all. Lieske (1990) explains that the major research issues in life quality studies

> have tended to revolve around its measurement, the magnitude of differences from one city to the next, and patterns of regional variation. As a consequence, most quality of life studies have been largely descriptive and either unable or unwilling to provide much theoretical or empirical insight into the determinants of life quality differences (p. 43).

An integrated technique would provide both the theoretical and empirical depth and insight that Lieske claims has been overlooked in the past literature and would allow for the formulation of a more universal view of the quality of life in target areas.

Building from these descriptions we define Quality of Life as "the measured fulfillment of human needs and wants". We feel that this definition provides the opportunity for the theoretical and empirical depth that other studies of quality of life have lacked, and if measured correctly should allow us to make strong conclusions about the differential effect of quality of life across areas. We are cognizant of the potential for error, and therefore use only commonly available data that is easily obtainable and verifiable in constructing our index of Quality of Life.

Despite these pitfalls using an index to measure Quality of Life provides a number of advantages. A properly constructed index has three key properties that are of particular value to our task. They are reliable, scaling data together for various observations using a set of rules, and those rules mean that using identical data gets identical scores. This makes the indexes reliable and comparable. Finally and most importantly to the scientific method indexes are repeatable, they use data and must define what data is included, and how that data is scaled together future researchers can replicate the study using identical data, or new data using the same scaling rules.

We constructed our index of Quality of Life using this approach. Our first interest was creating a reliable index, and to do so we needed a strong set of rules that we could follow when

scaling data into a final score. A number of systems of rules are available which meet the requirement of reliability. Two types of systems were of particular interest to us. The first incorporated a weighting scheme for variables and indicators to allow for differential effects into the scaling rules. The second (which is used in this analysis) does not weight the included variables or indicators, leaving each variable or indicator to affect the index in equal ways; thus, providing the strength of measurement by including all of these indicators equally.

We primarily use the second approach, which is also used by the United Nations Human Development Index, the Economic Freedom of the World Index and a number of others. We made this decision primarily due to limits in the underlying theory of quality of life. The results of our meta-analysis of indexes clearly showed areas that were important to quality of life and should be included in our index did not provide any real indication of the relative importance of any particular variable.

Theory

Classical theories of democracy posit that democratic governments act in the best interest of their citizens. Governments consult the citizenry at large to assess the will of the people and then attempt to implement the desires of the citizens to increase the security and happiness of the people. Furthermore, theories of liberal democracy state that in true democracies the burden falls on the majority to take care of those less fortunate (Finer, 1997). This notion of the majority taking care of the poor has lead to the creation of the well-fare state throughout most of the democratic world. Proponents of the welfare-state argue that wealth should be re-distributed through the taxation of the wealthy and social programs designed to aide those in need in order to boost their quality of life. Debates exist throughout both the normative and empirical political

science research regarding whether the welfare-state is the best system of democracy. We attempt to add to this debate by testing the expenditures of the U.S. government to the counties of America.

In theory, a liberal government should be distributing a greater portion of it expenditures to areas in need. Needy areas are precisely the ones lacking in the goods and services that boost their quality of life. Thus, the government should expend money in these areas to provide services and programs that increase quality of life. Furthermore, liberal theories predict that government expenditures to these areas should actually increase quality of life. Simply put the more government programs and services provided in any given area, the higher the quality of life should be for that area.

The logic of liberal democracies leads us to make the following claims. First, areas with low quality of life should be more likely to receive government expenditures. In this paper, we test this claim using our quality of life measure for U.S. counties and U.S. federal expenditure data. We argue that there should be a negative and significant relationship between county quality of life and the amount of federal money and projects received by counties. Second, increases in government expenditures to counties should increase the quality of life for counties. Thus, the more money and projects counties receive from the U.S. government, the higher their quality of life should be. Our tests of attempts to determine the following questions: Does Congress select the counties most in need when determining where to allocate local spending? Do increases in federal spending actually make life better for the counties receiving federal assistance?

Hypotheses

Our theory lends itself to two basic types of hypotheses about the affect federal dollars on quality of life on direct democracy measures. The first directly examines the effects of additional federal funds on quality of life. Our first hypothesis is H1: As the amount of federal funds received by a county increases the quality of life in that county increases. Our second hypothesis recognizes the likely scenario where lower quality of life encourages citizens to demand more form government and therefore receive greater federal expenditures. Therefore, H2: Counties with lower quality of life receive greater federal funds.

Methods and Data

The data for this paper includes data on Federal Expenditures from 2004-2006 and Quality of Life measures in the same period. This analysis draws on constructed Quality of Life measures and combines them with FAADS data to demonstrate the impact of federal funds on aggregate life quality as well as the reverse relationship.

Building from our preference for open data availability, we use only publically available data. Our primary sources is the 2000 Census and the 2005 mid census estimate for all US states, and our secondary source is the National Center for Educational Statistics. This data is commonly available free of charge from the United States Census website, or the NCES website. In Appendix One, we include the census codes of the variables we used to aid replication and verification of our index. The end use of our index of Quality of Life is not simply to enable a rank ordering state, we selected rules that would provide a unique score for each state, and could be used in future statistical projects. Further, following earlier discussion of comparable indexes, we designed our index primarily to maximize variation and comparisons between observations.

We determined that because we were interested in the full universe of the United States our primary interest was in comparability within that particular group.

We followed a three-step procedure to scale data into our index. For each variable we converted the actual value to a scale from 0 to 1. To accomplish this scaling we used the well tested and verified metric of the United Nations Human Development Index. This method is uses the maximum observed value, the minimum observed value, and the actual observed value for each observation to scale the data. The basic formula is . Using this scaled value, which represents where each observation falls within the full universe of US States, allows for direct comparability within our data set without any further calculations. We know that a value of 1 is the maximum value, and a value of 0 is the minimum value, and between those values lies most of our observations. Because we convert each variable to this scale we are no longer measuring the actual results of a particular variable but rather the states score in relation the maximum and minimum observed for that value. This becomes important to our next step, where we aggregate the data into sub-indicators.

As we have scaled the variables to a ranking we can aggregate the values using simple averages, and for each sub indicator we aggregate those values by taking an average of the states core on each of the variables we include. The formula we use is where S is the scaled value of the individual variable, and X is the total number of variables included in the sub-indicator. After taking the average we scale the data using the above formula to obtain the value of the sub-indicator . Using the value of the sub indicators we can then calculate the value over the overall indicator using the same mechanism. Then we aggregate and rescale to achieve a final score that ranges from 0 to 1. We use the following formula- . Where SI is the scaled value of the Sub Indicator Average, and X is the total number of sub indicators included in the variable. We then

scale the average using . This provides the value of each of our sub indicators for every observation.

Using this calculated value we then calculate our final quality of life score. Again we aggregate the indicators, and rescale to achieve a final Quality of Life score that ranges from 0 to 1. We use the formula . Where I is the scaled value of the indicator, and X is the total number of indictors included in the index. We then scale the average using . This final scaled result is the Quality of Life score for each state.

This methodology allows disparate data to be combined into a commons scale, but does it meet the requirements we laid out earlier for a good scale. Our first concern was that of reliability. By applying the formulas consistently, we achieve the results, that given the same data are identical thus, our measure is reliable. Our second criterion for a good scale is comparability, using this set of rules for scaling we can directly compare each state using an identical metric, the results are comparable. Our third criterion is that they must be severable, and because we scale each individual piece of data before aggregating the values we can compare states using any subpart of the scale. Our fourth criterion is repeatability, because we use commonly available census data that is gathered four times a decade, and provide a clear delineation of how we scale that data together our scale is readily repeatable. We added two additional criteria that we felt were essential to a good scale, openness and parsimony. All of our data are commonly available through non-proprietary sources, and we use a relatively small number of variables to create our scale. On each of our criterion, we meet what the established requirements for a good index.

While we were establishing the rules we followed while scaling we undertook to ensure that we did not have to include what a co-author from a previous project calls ‘fancy math’. We

did so for a variety of reasons but primarily because anytime you add statistical sophistication to a project like an index you add both statistical error, and increase the changes of human error altering the index. Our standard approach was to the use the simplest methodology that could still accomplish the full task. It is our belief that in scale building this approach is particularly important given the criticisms we discussed earlier.

Our index of Quality of Life has five indicators: Public Safety, Health, Economic Development, Infrastructure, and Education. Using our established methodology, we calculated scores for each of these indicators and finally an overall Quality of Life score. This is developed from the literature, and our understanding of these areas differs each indicator has variable number of component pieces, from a single variable in Public Safety to over a dozen in Economic Development. In each case, we used literature on quality of life as to determine what those component pieces should be. For example, our original conception of Public Safety included a large number of variables that measured different areas of crime, but after further review of the literature and the testing for scalability with the other indicators this did not add information about quality of life. Rather, we found that the funding effort for each state was a better predictor of quality of life than the outcome of crime. A more detailed discussion can be found in "Quality of Life in the Rural West" from the Institute of Public Lands and Rural Economics at Utah State University.

FAADS Data

Our data on federal outlays comes from the United States Federal Assistance Award Data System (FAADS). The FAADS dataset tracks federal outlays to their geographic location and records several variables indicating the amount and type of outlay (see Bickers, & Stein 1991;

1996; Lazarus, & Reilly, 2010). Most studies using FAADS data focus on outlays to congressional districts. We use the FADDS data in a slightly different manner. Instead of calculating the amount of outlays for congressional districts, we calculate federal expenditures for counties. Using FAADS we are able to calculate four variables indicating both new and continuous federal expenditures. We calculate the total dollars given to counties, the amount of new dollars given to counties, the total number projects given to counties, and the amount of new projects given to counties.

Tests and Results

Because we speculate that our independent variable of interest and our dependent variable are endogenous predictors of each other we utilize two state least squares regression in order to test our hypotheses. We first undertake to establish that the relationship between the variables is indeed endogenous. Using a Hausman test, we find at the .05 level that quality of life and total funds are endogenously related and that 2SLS is an appropriate methodological choice.

Further because our data are collected over time we use a times series 2SLS in order to capture the temporal effects of our data. We first test our hypothesis that greater federal expenditures result in higher quality of life. To do so we used federal expenditure in thousands of dollars as our primary independent variable.

Table 7.1
Quality of Life—G2SLS
Observations 9363
Groups 3

Variable	Coef	Robust Standard Error	P Value
Federal Expenditures	**.0001**	**1.86e-06**	**.000****
Population	**-.0001**	**.0002**	**.000****
Population Growth-Households	**-.0027**	**.0004**	**.000****
Local Government Revenue	**1.00e-06**	**5.36e-07**	**.062**
Per Capita Income	**.00079**	**.0003**	**.012***
Percentage White	**.0836**	**.0189**	**.000****
Crime Rate	**-.1469**	**.3075**	**.633**
Unemployment Rate	**.0023**	**.0004**	**.000****
Constant	**15.141**	**1.625**	**.000****

*significant at the .1 level **significant at the .05 level ***significant at the .01 level

The results from table 7.1 confirm our first hypothesis that in fact greater federal expenditures do lead to increased quality of life. For each additional one thousand dollars quality of life increases by .0001. Given these results it appears that the expenditure of federal funds at least in some small way has a positive effect on the life quality of citizens, and that our larger theory that government affects life quality is valid.

The result of our test of H2 disconfirm out stated theory that lower quality of life areas get more federal funds. Table 7.2 like table 7.1 reports the results of a G2SLS regression.

Table 7.2
Federal Expenditures—G2SLS
Observations 9363
Groups 3

Variable	Coef	Robust Standard Error	P Value
Quality of Life	**1391133**	**384540.7**	**.000****
Percent Democratic	**-120378.7**	**36002.39**	**.001****
Population	**-.3602**	**1.84**	**.845**
Population Growth-Households	**523.95**	**113.98**	**.000****
Local Government Revenue	**-.9515**	**.329**	**.004***
Per Capita Income	**-224.49**	**66.86**	**.001****
Percentage White	**-41186.27**	**11203.31**	**.000****
Constant	**-2.13e+07**	**5926890**	**.00****

*significant at the .1 level **significant at the .05 level ***significant at the .01 level

Table 7.2 indicates that as quality of life increases the total amount of federal funds increase, further this occurs even when population levels, per capita income racial make up and the political alignment of the county with the sitting president are controlled for. Our results seem to indicate that rather than problems and deficiencies as predicted by our theory attracting federal fund success and improvement and generally high quality of life do so instead.

Implications

Using our results we suggest an alternate theory to explain the relationship between the appropriation of federal funds and quality of life. We find that instead of a relationship where federal funds are used to correct problems and improve deficient quality of life, areas with high quality of life attract greater federal spending which in turn improves the quality of life in those areas.

It seems likely given this results and the distinctly political nature of the appropriations process for FAADS money, the motivation of citizens and politicians in these high quality of life area seek to guarantee a virtuous circle where high quality of life is buoyed by additional federal

spending, which then increases quality of life, and ensures that citizens continue to experience the level of life quality they expect given the status quo.

These results confirm the findings of Yonk and Reilly (2010), whose results suggest that areas with higher quality of life have greater citizen involvement in direct democracy elections and that those citizens seek to protect the status quo by their actions.

While the action of citizens and politicians in high quality of life areas are certainly rational in seeking additional funds there remains an important counter claim that would indicate that those areas with an already lower quality of life may have less access to the federal funds which have the potential to improve the quality of life in their boundaries. These areas may then become caught in a vicious circle where federal funds are demanded by citizens in higher quality of life areas and they are simply left out and fail to make the improvements that could improve quality of life in their boundaries.

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APPENDIX 1: Calculating the Index

Education:

The Education indicator is composed of three sub-indicators: Funding Effort, Outcomes, and Service Availability. Taken together these indicators provide an understanding of education across counties.

Follow the procedure below to calculate the Education Score:

The first sub indicator in education is Funding Effort; a Q score designates the scaled results. The primary interest is in the percent of the local budget devoted to education services, per capita educational payroll, and per pupil spending. I aggregated the scaled results for each of these areas and scaled the average to obtain a score for Funding Effort, Table 1 identifies the variables used to construct this sub-indicator and Table 2 provides the specific order of operations used to score this sub-indicator.

Table 1-Variables

LOG320202D	Ed Spending
LOG310202D	Total Budget
BZN700205D	Ed Payroll in $
AGE040205D	Population
LOG320202D	Ed Spending
EDU010202D	Enrolled Students

Table 2-Order of Operations

	LOG320202D	Ed Spending
	LOG310202D	Total Budget
1	Percent Budget Ed	LOG320202D/LOG310202D
2	Percent Budget Ed Q	Scale Results (X-min)/(max-min)
	BZN700205D	Ed Payroll in $
	AGE040205D	Population
3	ed payroll per cap	BZN700205D/ AGE040205D

4	Ed Payroll Q Score	Scale Results (X-min)/(max-min)
	LOG320202D	Ed Spending
	EDU010202D	Enrolled Students
5	Per Pupil Spending	LOG320202/EDU10202D
6	Per Pupil Q	Scale Results (X-min)/(max-min)
	Percent Budget Ed Q	Result of Operation 2
	Ed Payroll Q Score	Result of Operation 4
	Per Pupil Q	Result of Operation 6
7	Funding Effort Score	(OP2+OP4+OP6)/3
8	Funding Effort Scaled	Scale Results (X-min)/(max-min)

The Result of Operation 8 is the Funding Effort Score for each county.

The second sub-indicator in education are Educational Outcomes, a Q Score designates the scaled results. The primary interest is in the percentage of high school completers from 16-19, college enrollment, percent of total population with a high school diploma, percent of the total population with a college diploma, and the percentage of the population completing less than ninth grade. I then aggregated the scaled results for each of these areas and scaled the average to obtain a score for Educational Outcomes, Table 3 identifies the variables used to construct this indicator and Table 4 provides the specific order of operations used to score this sub-indicator.

Table 3-Variables Needed

EDU920200D	High School Completers
EDU910200D	Persons 16 to 19 years 2000 (population used to calculate high school dropout rates)
EDU380200D	Persons enrolled in College
AGE010200D	Population
EDU635200D	% Population with HS Diploma
EDU685200D	% Population college Grad

EDU610200D	Count of Population with less than 9th Grade
EDU600200D	Total Population 25 yes +

Table 4-Order of Operations

	EDU920200D	High School Completers
	EDU910200D	Persons 16 to 19 years 2000 (population used to calculate high school dropout rates)
9	High School Completion Rate	EDU920200D/EDU910200D
10	HS Complete Q	Scale Results (X-min)/(max-min)
	EDU380200D	Persons enrolled in College
	AGE010200D	Population
11	College Enrollment	EDU380200D/AGE10200D
12	College Enroll Q	Scale Results (X-min)/(max-min)
	EDU635200D	% Population with HS Diploma
13	Pop HS grad Q	Scale Results (X-min)/(max-min)
	EDU685200D	% Population college Grad
14	Pop college Grad Q	Scale Results (X-min)/(max-min)
	EDU610200D	Count of Population with less than 9th Grade
	EDU600200D	Total Population 25 yes +
15	Pop Less than 9th Grade	EDU610200D/EDU600D
16	Pop Less than 9th q	Scale Results (X-min)/(max-min)
	HS Complete Q	Value of Operation 10
	College Enroll Q	Value of Operation 12
	Pop HS grad Q	Value of Operation 13
	Pop college Grad Q	Value of Operation 14
	Pop Less than 9 th q	Value of Operation 16
17	Ed Outcome	(OP10+OP12+OP13+OP14+OP16)/5
18	Ed Out Come Scaled	Scale Results (X-min)/(max-min)

The Result of Operation 18 is the Educational Outcomes Score

The final sub-indicator in education is Service Availability; a Q Score designates the scaled results. The primary interest is in the number of educational establishments per capita, and the availability of Charter and Magnet Schools. I measure charter and magnet schools dichotomously with a value of 1 for counties with a charter or magnet school. I aggregated the

scaled results for each of these areas and scaled the average to obtain a score for Service Availability, Table 5 identifies the variables used to construct this indicator and Table 6 provides the specific order of operations used to score this sub-indicator.

Table 5-Service Availability

BZN685202D	Ed Establishments
AGE040202D	Population
Magnet (Dichot)	NCES Presence of Magnet School
Charter (Dichot)	NCES Presence of Charter School

Table 6-Order of Operations

	BZN685202D	Ed Establishments
	AGE040202D	Population
19	Per Cap ed inst	BZN685202D/AGE040202D
20	Ed Inst Entities Q	Scale Results (X-min)/(max-min)
	Magnet	NCES Presence of Magnet School
	Charter	NCES Presence of Charter School
21	School Choice	Magnet + Charter / 2
22	School Choice Q	Scale Results (X-min)/(max-min)
	Ed Inst Entities Q	Value of Operation 20
	School Choice	Value of Operation 22
23	Ed Avail	(OP20+OP22)/2
24	Scaled	Scale Results (X-min)/(max-min)

The Result of Operation 24 is the Service Availability Score

Using each of the sub indicators for Education; Funding Effort, Educational Outcomes, and Service Availability, I averaged the scores for each county, and scaled the average to calculate the final Education score.

Table 7- Final Education Score

	Funding Effort Scaled	OP 8
	Ed Out Come Scaled	OP 18

	Service Availability Scaled	OP 24
25	Ed Score Average	(OP8+OP18+OP24)/3
26	Scaled	Scale Results (X-min)/(max-min)

The Final Education Score is the Value of Operation 26.

Public Safety:

The Public Safety indicator is composed of a single sub indicator, Funding Effort. This indicator provides an understanding of how public safety is provisioned across counties. This single indicator captures the relationship between the individual citizen and the purchase of public safety services.

Follow the procedure below to calculate the Public Safety Score:

The only sub-indicator in Public Safety is Funding Effort; a Q Score designates the scaled results. The primary interest is in the expenditure per capita for both police and fire. I aggregated the scaled results for each of these areas and scaled the average to obtain a score for Funding Effort. Table 8 identifies the variables used to construct this indicator and Table 9 provides the specific order of operations used to score this sub-indicator.

Table 8-Variables Needed

LOG380202D	Expenditures for police protection FY 2002
LOG020202D	Population per capita 2002
LOG390202D	Expenditures for fire protection FY 2002

Table 9-Order of Operations

	LOG380202D	Expenditures for police protection
	LOG020202D	Population per capita 2002
1	Police Expenditures per Capita	LOG380202D/LOG020202D
2	Police Expenditures per Capita Q	Scale Results (X-min)/(max-min)

	LOG390202D	Expenditures for fire protection
	LOG020202D	Population per capita 2002
3	Fire Expenditures per Capita	LOG390202D/LOG020202D
4	Fire Expenditures per Capita Q	Scale Results (X-min)/(max-min)
	Police Expenditures per Capita Q	Value of Operation 2
	Fire Expenditures per Capita Q	Value of Operation 4
5	Funding Effort Score	(O2+O4)/2
6	Funding Effort Scaled	Scale Results (X-min)/(max-min)

The Result of Operation 6 is the Sub-indicator score, and the final Public Safety Score

Health:

The Health Indicator is composed of three sub-indicators: Service Availability, Funding Effort, and Rates of Health Insurance Coverage. Taken together these indicators provide an understanding of education across counties.

Follow the procedure below to calculate the Education Score:

The first sub indicator in education is Service Availability; a Q Score designates the scaled results. The primary interest is in the number of physicians per 1000 residents, employment of non-physicians in health care. I have aggregated the scaled results for each of these areas and scaled the average to obtain a score for Service Availability. Table 10 identifies the variables used to construct this indicator and Table 11 provides the specific order of operations used to score this sub-indicator.

Table 10-Variables Needed

HEA270205D	Number of physicians
AGE040205D	Population
EMN350205D	Number employed in health care

Table 11-Order of Operations

Operation Number	Mathematical Operation	What the math represents
	HEA270205D	Number of physicians
	AGE040205D	Population
1	HEA270205D/AGE040205D*1000	Doctors Per 1000
2	Scale Results (X-min)/(max-min)	Doctors per 1000 Scaled Score
	EMN370205D	Number employed in health care
	AGE040205D	Population
3	EMN370205D / AGE040205D	Health care employees per capita
4	Scale Results (X-min)/(max-min)	Health care employment Q Score
5	(OP2+OP4)/2	Service Availability Average
6	Scale Results (X-min)/(max-min)	Service Avail Scaled Result

The result of operation 6 is the Service Availability Score.

The second sub-indicator in Health is Funding Effort on health related activities; a Q Score designates the scaled results. The primary interest is in hospital spending per capita and payroll of health care workers, which capture both private and public spending on health in each county. I aggregated the scaled results for each of these areas and scaled the average to obtain a score for Health Funding Effort. Table 12 identifies the variables used to construct this indicator and Table 13 provides the specific order of operations used to score this sub-indicator.

Table 12-Variables Needed

LOG340202D	Budget spent on hospitals
AGE040205D	Population
BZN740205D	Payroll of health care professionals

Table 13-Order of Operations

	LOG340202D	Budget spent on hospitals
	AGE040202D	Population
7	BZN685202D/AGE040202D	Per capita health spending
8	Scale Results (X-min)/(max-min)	Scaled per capital spending
	BZN740205D	Health care Payroll in $

	AGE040202D	Population
9	BZN740205D /AGE040202D	Per capita health care payroll
10	Scale Results (X-min)/(max-min)	Scaled per capita health care payroll
11	(OP10+OP12)/2	Funding effort score
12	Scale Results (X-min)/(max-min)	Funding effort scaled score

The Result of Operation 14 is the Funding Effort Score.

The final sub-indicator in health is the Rate of Insurance Coverage for each county. I calculated this rate using the reported number of persons without coverage, as a percentage of the overall population. I then scaled these results to achieve a score for insurance coverage. Table 14 identifies the variables used to construct this indicator and Table 15 provides the specific order of operations used to score this sub-indicator.

Table 14-Variables Needed

HEA775205D	Persons without health insurance

Table 15-Order of Operations

Operation Number	**Mathematical Operation**	**What the math represents**
	HEA775205D	Persons without health insurance
13	100- HEA775205D	Persons with health insurance
14	Scale Results (X-min)/(max-min)	Scaled insurance rate score

The Result of Operation 14 is the Insurance Rate Score.

Using each of these sub-indicators for Health: Service Availability, Funding Effort, and Insurance Rate, I averaged the scores for each county, and scaled the average to calculate the final Health score.

Table 16- Final Health Score

	Service Availability Score	OP 6
	Health Outcomes	OP 8
	Funding Efforts Score	OP 14

	Insurance Rate Score	OP 16
15	Ed Score Average	(OP6+OP8+OP14+OP16)/4
16	Scale Results (X-min)/(max-min)	Final Health Score

The Final Health Score is the Value of Operation 16.

Economic Development:

The Economic Development indicator is composed of three sub-indicators: Service Availability, Outcomes, and Funding Effort. Taken together these indicators provide an understanding of Economic Development across counties.

Follow the procedure below to calculate the Economic Development score:

The first sub indicator in education is Service Availability; a Q Score designates the scaled results. The primary interested is in the availability of employment and business opportunities. The variables of interest include: total business establishments, travel time to work, location of place of work, and the change in total business establishments from the previous year (measuring new business growth). I aggregated the scaled results for each of these areas and scaled the average to obtain a score for service availability. Table 17 identifies the variables used to construct this indicator and Table 18 provides the specific order of operations used to score this sub-indicator.

Table 17-Variables Needed

BZA010205D	Private nonfarm establishments 2005
AGE040205D	Resident population total (July 1 – estimate) 2005
LFE305200D	Average travel time to work for workers 16 years and over not
LFE140200D	Place of work – worked outside county of residence 2000
AGE010200D	Resident population (April 1 – complete count) 2000
BZA010204D	Private nonfarm establishments 2004

Table 18-Order of Operations

	BZA010205D	Private nonfarm establishments
	AGE040205D	Resident population total
1	Employers Per Capita	BZA010205D/AGE040205D
2	Employers Q Score	Scale Results (X-min)/(max-min)
	LFE305200D	Average travel time to work
3	Commute Time Q Score	1-((X-min)/(max-min))
	LFE140200D	Place of work – worked outside county
	AGE010200D	Resident population
4	Percent Out of County	LFE140200D/AGE010200D
5	Percent Out of County Q Score	Scale Results (X-min)/(max-min)
	Commute Time Q Score	Result of Operation 3
	Percent Out of County Q Score	Result of Operation 5
6	Travel for Employment	(OP3+OP5)/2
	BZA010204D	Private nonfarm establishments
	BZA010205D	Private nonfarm establishments
7	New Business	BZA010205D-BZA010204D
8	Business Entities 1 Year Change	Result of Operation 3/BZA010204D
9	Business Entities 1 Year Change Q	Scale Results (X-min)/(max-min)
	Employers Q Score	Result of Operation 2
	Travel for Employment Q Score	Result of Operation 6
	Business Entities 1 Year Change Q	Result of Operation 9
10	Econ Service Availability Score	(OP2+OP6+OP5)/3
11	Scaled Econ Service Availability	Scale Results (X-min)/(max-min)

The Result of Operation 11 is the Econ Service Availability Score.

The second sub-indicator in Economic Development is Economic Outcomes; a Q Score designates the scaled results. The primary interest is in per capita income, the unemployment rate, and the economic diversity of the county. I aggregated the scaled results for each of these areas and scaled the average to obtain a score for Economic Outcomes. Table 19 identifies the

variables used to construct this indicator and Table 20 provides the specific order of operations used to score this sub-indicator.

Table 19-Variables Needed

PEN020205D	Per capita personal income 2005
CLF040205D	Civilian labor force unemployment rate 2005
*Diversity Score	Diversity of Industrial Make up

Table 20-Order of Operations

	PEN020205D	Per capita personal income
12	Income Q Score	Scale Results (X-min)/(max-min)
	CLF040205D	Civilian labor force unemployment rate
13	Employment Rate	100-X
14	Unemployment Q Score	Scale Results (X-min)/(max-min)
	Income Q Score	Result of Operation 8
	Unemployment Q Score	Result of Operation 10
	Diversity Q Score	Hachman Score
15	Economic Outcome Score	(OP8+OP10+*A2)/3
16	Scaled Outcome Score	Scale Results (X-min)/(max-min)

The Result of Operation 16 is the Economic Outcomes Score.

The final sub-indicator in Economic Development is Funding Efforts towards economic development as measured by capital availability in each county. Using total bank deposits, total annual payroll, and total expenditures in manufacturing, I scaled these results to achieve a score for Funding Effort. Table 21 identifies the variables used to construct this indicator and Table 22 provides the specific order of operations used to score this sub-indicator.

Table 21-Variables Needed

BNK050205D	Commercial banks and savings institutions (FDIC-insured)
AGE040205D	Resident population total (July 1 – estimate) 2005
MAN470202D	Manufacturing: total (NAICS 31-33) – total expenditures
BZA210205D	Private nonfarm annual payroll 2005

Table 22-Order of Operations

	BNK050205D	Commercial banks and savings
	AGE040205D	Resident population total
17	Total Deposits Per Capita	BNK050205D/AGE040205D
18	Total Deposits Per Capita Q	Scale Results (X-min)/(max-min)
	MAN470202D	Manufacturing: total – total
	BZA210205D	Private nonfarm annual payroll
19	Manufacturing Capital	MAN470202D/BZA210205D
20	Manufacturing Capital Q Score	Scale Results (X-min)/(max-min)
21	Payroll Per Capita	BZA210205D/AGE040205D
22	Payroll Per Capita Q Score	Scale Results (X-min)/(max-min)
	Total Deposits Per Capita Q	Result of Operation 17
	Manufacturing Capital Q Score	Result of Operation 20
	Payroll Per Capita Q Score	Result of Operation 22
23	Funding Effort Score	(OP17+OP20+OP22)/3
24	Scaled Funding Effort Score	Scale Results (X-min)/(max-min)

The Result of Operation 24 is the Funding Effort Score.

Using each of these sub-indicators for Economic Development: Funding Effort, Service Availability, and Economic Outcomes I averaged the scores for each county, and scaled the average to calculate the final Economic Development score.

Table23- Final Economic Development Score

	Econ Service Availability Score	Result of Operation 11
	Economic Outcomes Score	Result of Operation 16
	Funding Effort Score	Result of Operation 24
25	Econ Development Score Average	(OP11+OP16+OP24)/3
26	Scaled Econ Development Score	Scale Results (X-min)/(max-min)

The Final Economic Development Score is the Value of Operation 26.

Infrastructure:

The indicator of Infrastructure is composed of two sub-indicators: Service Availability, and Funding Effort. Taken together these indicators provide an understanding of infrastructure development across counties.

Follow the procedure below to calculate the infrastructure score:

The first sub-indicator in education is Service Availability; a Q Score designates the scaled results. The primary interest is in the percentage of households that have access to various types of utility services. The variables of interest include: population served by public water, households with grid fuel available for use, and telephone availability penetration. These measures capture both publically and privately provided infrastructure. I have aggregated the scaled results for each of these areas and scaled the average to obtain a score for service availability. Table 24 identifies the variables used to construct this indicator and Table 25 provides the specific order of operations used to score this sub-indicator.

Table 24-Variables Needed

WAT210200D	Public water supply: population served
AGE040200D	Resident population total
HSG310200D	Houses with heating utility service
HSG230200D	Occupied housing units
HSG365200D	Occupied houses with no telephone service available

Table 25-Order of Operations:

	WAT210200D	Public water supply: population served
1	Convert WAT210200D to Per Capita	WAT210200D*1000
	AGE040200D	Resident population total
2	Percent Grid Water	O1/ AGE040200D
3	Percent Grid Water Score Scaled	Scale Results (X-min)/(max-min)
	HSG310200D	Houses with heating utility service
	HSG230200D	Occupied housing units
4	Percent Occupied Houses on the Fuel Grid	HSG310200D/ HSG230200D
5	Fuel Grid Score Scaled	Scale Results (X-min)/(max-min)
	HSG365200D	Occupied houses with no telephone service available
	HSG230200D	Occupied housing units
6	Percent Telephone Service	1-(HSG365200D/ HSG230200D)
7	Telephone Service Score Scaled	Scale Results (X-min)/(max-min)
	Percent Grid Water Score Scaled	Value of O3
	Fuel Grid Score Scaled	Value of O5
	Telephone Service Score Scaled	Value of O7
8	Infrastructure Service Availability Score	(O3+O5+O7)/3
9	Infrastructure Service Availability Scaled	Scale Results (X-min)/(max-min)

The Result of Operation 9 is the Service Availability Score

The second sub-indicator in Infrastructure is Funding Effort; a Q Score designates the scaled results. The primary interest is in governmental revenues (a measure of funds available for use in infrastructure), direct expenditures on highways, and long term debt for utilities of each

county. I aggregated the scaled results for each of these areas and scaled the average to obtain a score for Funding Effort. Table 26 identifies the variables used to construct this indicator and Table 27 provides the specific order of operations used to score this sub-indicator.

Table 26-Variables Needed

LOG010202D	Local Government General Revenue
LND110200D	Land Area in Square Miles
LOG015202D	Local Government General Revenue per capita
LOG370202D	Direct Expenditures on Highways
LOG020202D	Population used for Per Capita
LOG550202D	Long-term Debt for Utilities

Table27-Order of Operations:

	LOG010202D	Local Government General Revenue
	LND110200D	Land Area in Square Miles
10	Income per sq Mile	LOG010202D/ LND110200D
11	Income per sq Mile Scaled	Scale Results (X-min)/(max-min)
	LOG015202D	Local Government General Revenue per capita
12	Revenue Per Capita Scaled	Scale Results (X-min)/(max-min)
	LOG370202D	Direct Expenditures on Highways
	LOG020202D	Population used for per capita
13	Transportation Funding Per Capita	LOG370202D/ LOG020202D
14	Transportation Funding Per Capita Scaled	Scale Results (X-min)/(max-min)
	LOG550202D	Long-term Debt for Utilities
	LOG020202D	Population used for per capita
15	Utility Debt Per Capita	LOG550202D/ LOG020202D
16	Utility Debt Per Capita Scaled	Scale Results (X-min)/(max-min)
	Revenue Per Capita	Value of O12
	Income Per Sq Mile	Value of O11
17	Available Tax Revenue	(O11+O12)/2
18	Tax Revenue Scaled	Scale Results (X-min)/(max-min)
	Transportation Funding	Value of O13

	Utility Debt	Value of O16
19	Investment Score	(O13+O16)/2
	Tax Revenue	Value of O18
20	Outcome Funding Effort	(O18+O19)/2
21	Outcome Funding Effort Scaled	Scale Results (X-min)/(max-min)

The Result of Operation 21 is the Outcomes Score

Using both of the sub-indicators for Funding Effort and Service Availability I averaged the scores for each county and scaled the average to calculate the final infrastructure score.

Table 28-Final Infrastructure Score

	Outcome Funding Effort Scaled	Value of O21
	Infrastructure Service Availability Scaled	Value of O9
22	Infrastructure Score	(O21+O9)/2
23	Infrastructure Score Scaled	Scale Results (X-min)/(max-min)

The Final Infrastructure Score is the Value of Operation 23

Final Quality of Life Score:

To calculate the final Quality of Life Score I aggregated the scores for each of the indicators by averaging their scaled values, and scaled that average to obtain a final quality of life score that ranges from 0 to 1. This final score allows each county to be readily compared with any other county, the final score represents where the county falls in relation to the maximum and minimum observed values. The county with the lowest averaged score across the indicator receives a final score of 0, while the county with the highest average score receives a score of 1.

APPENDIX 2: Sample Undergraduate Survey

Instructions

Please do not include your name or other identifying information on this form. If at any time you do not wish to answer a question leave it blank, if you want to end the survey at any time you may do so.

Part I:

For each of the questions below please choose answer that best describes you by circling the letter next to that answer.

1) _____ **Race/Ethnic Background**

a. Caucasian
b. African American
c. Asian
d. Native American
e. Other
f. No Response

2) _____ **Gender**

a. Male
b. Female
c. Other_____

3) _____ **Religious Preference**

a. Christian
b. LDS/Mormon
c. Atheist
d. Catholic
e. Islam

f. Other_____(please indicate preference if other)

g. Prefer not to Answer

4) _____ **If LDS/Mormon**

a. Served an LDS Mission

b. Did Not Serve an LDS Mission

c. Will serve an LDS Mission in the future

5) _____ **Marital Status**

a. Single

b. Married

c. Divorced

d. Widow/Widower

e. Living with Significant Other

f. Other_____

g. Prefer Not to Answer

6) _____ **What best describes your current employment situation**

a. Employed Full Time

b. Employed Part Time

c. Un-Employed

d. Do Not work because of School

e. Unable to Work

f. Prefer Not to Answer

7) _____ **Do You have children?**

a. No

b. Yes 1-2

c. Yes 3-4

d. Yes 5+

8) _____ **Age**

a. 18-22

b. 22-25

c. 25-30

d. 30-35

e. 35+

9) _____ **What is Your University Class Status**

a. Freshman

b. Sophomore

c. Junior

d. Senior

e. Other_____

10) _____ **What is your current USU GPA**

a. None

b. Less than 2.0

c. 2.0-2.5

d. 2.51-3.0

e. 3.01-3.5

f. 3.51-4.0

11) _____ **What is the highest level of education either of your parents have achieved**

a. Less than High School Diploma

b. High School Diploma

c. Some College
d. Bachelors Degree
e. Advanced Degree

12) _____ **How have you primarily financed your USU education**

a. Own Funds/Savings
b. Parents
c. Scholarships
d. Grants/Student Loans
e. Private Loans

13) **What is Your Major?** _____

14) _____ **Which of the following categories best represents where you would describe yourself as being from?**

a. Cache County
b. Utah, Outside Cache County
c. Intermountain West, Outside Utah
d. United States, Outside Intermountain West
e. Outside the United States

15) _____ **With what political party do you identify?**

a. Republican
b. Democrat
c. Constitution
d. Green

e. Libertarian

f. Other_____

16) _____ **How Would You Describe Your political Ideology?**

a. Very Conservative

b. Conservative

c. MOderate

d. Liberal

e. Very Liberal

f. Other_____

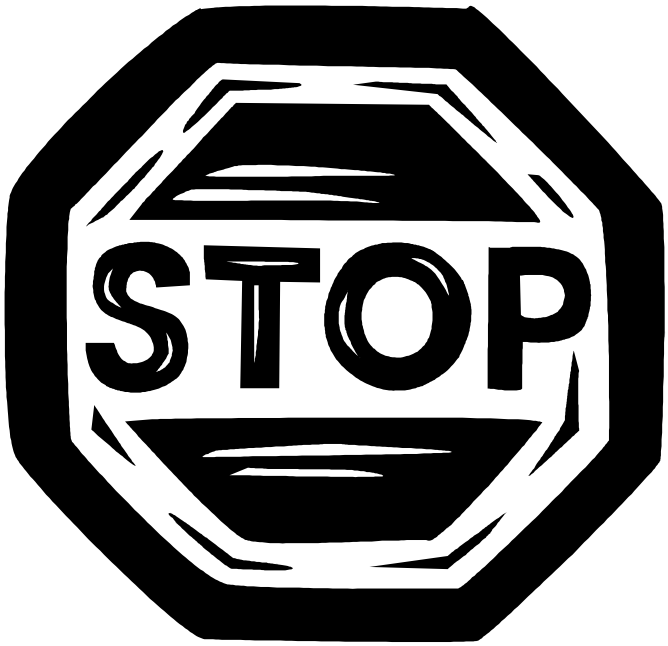
17) _____ **Would you say that your political beliefs are;**

a. Held by the majority of other USU students

b. Held by the minority of other USU students

c. Held by nearly all other USU Students

d. Held by almost no other USU Students



Do Not Proceed Until Directed

Part II:

Below are two news stories about Utah State University, please consider the information below and respond to the questions asked by circling your preferred answer.

USU imposes furloughs for 3,000 employees

By Wendy Leonard

Deseret News

Published: Monday, Feb. 2, 2009 10:56 p.m. MST

A mandatory week off without pay has been imposed for all employees at Utah State University.

The action, announced Monday, is in reaction to a recent legislative decision to further cut budgets at Utah's higher education institutions. USU is being asked to come up with an additional $5.65 million and furloughs for USU's 2,995 full- and part-time employees will stave off immediate and widespread layoffs as a result of the second round of budget cuts, according to USU spokesman John DeVilbiss.

Employees are required to take leave without pay for five work days during spring break, March 9-13, during which all university facilities will be closed.

"With just five months left in the fiscal year, and because most of our funds for fiscal 2009 are already committed to salaries and programmatic support, it is essential that we move quickly now that we know the magnitude of the additional hold back," USU President Stan L. Albrecht said in a statement.

Amounts recouped with the furloughs are expected to generate 60 percent of additional amounts the school has been asked to cut, and come in addition to 4 percent cuts mandated by state government late last year. Lawmakers have yet to address funding for 2010, which will be when schools ultimately feel the budget burn.

Albrecht said the current decision to push a furlough was difficult, but easier than permanently laying off employees.

"We have tried to be particularly sensitive to the loss of jobs, which would be so devastating to individuals and their families," he said. Through talks with groups involving faculty and staff

members, Albrecht said the employees "would prefer to find some way to share the pain of the reduction, rather than see large numbers of their colleagues lose their jobs."

All of Utah's public colleges and universities affected by the cuts have tried to minimize the impact on students, while still coming up with cuts equaling 7.5 percent of their nearly spent funding for the current year. Unfilled positions are remaining empty, moratoriums have been placed on travel in many cases and spending has been put on emergency-only basis at many of the schools. Many have already laid off workers and eliminated programs.

USU's furloughs will allow many of their core programs and student services to remain untouched. Albrecht said the anticipated impact on other units "will be modest — approximately 0.65 percent."

Financial impact to the 921 full-time faculty and 1,779 full-time support staff for the five furloughed days will be spread across five monthly pay periods, leaving each paycheck reduced by the equivalent of one day's salary, beginning in March. The amount will be pro-rated for USU's 36 part-time faculty and 259 part-time staff.

University administrators have also been asked by Albrecht to develop a plan for further cuts in their units, which will be reviewed by the acting six-member Budget Reduction Committee, formed in October following the first round of budget reductions. Early retirement options are also being discussed, as well as voluntary separation incentives, which may be announced later this week.

As decided late Friday, USU will get half of the 7.5 percent, or $11.3 million budget cut for FY09 back in one-time backfill, but legislative analysts have indicated a 15 percent cut for FY10, which would require further personnel action at all 10 public colleges and universities, as well as other government agencies.

Officials are working to reduce further cuts but Albrecht said, "we cannot assume that we are through the worst of this difficulty until we see some evidence that the economy is making a positive turn."

Prosecutor Files Hazing Charges In Student Death
kutv.com
01.03.09
Jennifer Stag

George Starks' 18-year-old son Michael, a freshman at Utah state, died at the Sigma Nu Fraternity house a little over a month ago.

"It's a tough deal. Even though you have 6 kids, it's tough losing one," George said. "The ones who had control over this and could have stopped it, chose not to."

George says Utah State University's administration looked the other way to a history of hazing problems at the school.

George says the fraternity organized the hazing during which Michael was bound with duct tape, told to strip down, while sorority girls force fed him vodka.

Michael passed out and died, his blood alcohol level 4-times the legal limit.

George says Michael's own friends let him down.

"Kids make poor decisions, but one would have hoped that within this group of students that Michael had placed so much trust and faith in, that not one of them could have contacted the authorities in due time to save his life," George said.

Felony charges have now been filed against both the Sigma Nu Fraternity, and the Chi Omega Sorority.

12 students have also been charged with misdemeanors-- including the Sigma Nu President.

A grieving father says it's not enough.

"I would have liked to see charges against the school administration despite the nice soothing letters they sent out, which are very kind, but it would have been more kind if they would have made us aware prior to this whole thing happening that there was a danger zone there," George said.

George regrets people at the university never truly got to know the real Michael, a handsome young man with dreams of becoming a firefighter.

A life cut short in an initiation a father says should never have happened.

"It was our son this time, it could have easily been someone else," George said.

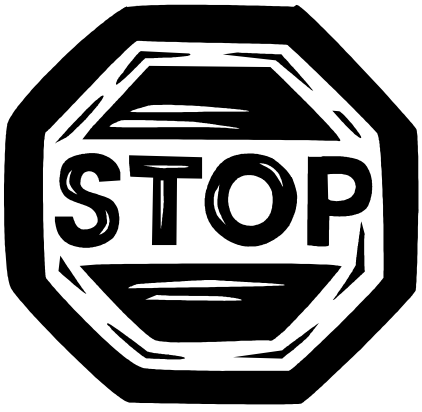
Consider the proposed student fee below, after reading and thinking about the fee please indicate whether you would support or oppose the fee.

Students' Initiative Fee Proposal

This $50 student fee increase provides funding to support the ongoing missions of a variety of campus organizations with diverse missions. Recipients of funds generated by this fee would include student clubs and organizations, research opportunities, student activities, and other organizations as determined by the fee board. This fee assessed at $50 per enrolled semester is expected to generate approximately 2 million dollars in funds that can be used to support the various organizations through the student fee process.

Do You Support or oppose the implementation of this Fee?

A. Support
B. Oppose



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Part III:

1. Who is the Current President of Utah State University?

   _____

2. What is the Name of the Student Association at USU?

   _____

3. Who is the Provost of Utah State University?

   _____

4. Name One Student Body Officer at USU.

   _____

5. Name as Many of the Colleges at USU as you can

   _____

   _____

6. What is the University Mascot?

   _____

7. What are the current student fees per semester at USU?

   _____

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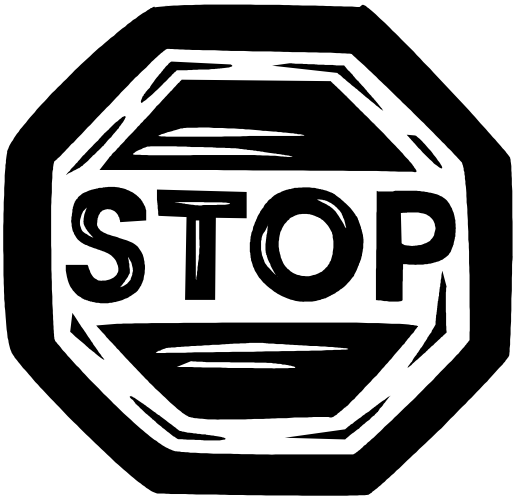
Part IV:

Considering your entire experience at Utah State University, using a scale from 0 to 10 with 0 being very low quality and 10 being very high quality how would you describe your overall quality of life during your university experience? Please Circle the Number that you feel best describes your experience.

0 1 2 3 4 5 6 7 8 9 10



Thank You

For Completing This Survey!