

The Four Vitals of Societal Health: How to Use Natural Science Metrics to Evaluate Social Science

By [Dr. Stephen E. Ling](#)

Theme: [History](#), [Science and Medicine](#)

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Introduction

How does one measure the health of a society?

When scholars from across the world are given the same society to analyze, they often come up with discordant, even diametrical conclusions. Why is that? Although a rare occurrence in natural science, such discordance is, unfortunately, a common scene in social science. The main reason is that those scholars often use different metrics. Social scientists have yet to come up with a unified set of metrics to objectively evaluate societal health—one that is independent of their individual ideologies. Our world has many versions of ideology metrics, which are all based on peoples’ belief systems, such as religious preferences and social-political predispositions. These are biased, by nature. The social sciences desperately need a set of metrics with objective qualities similar to those in natural science.

The social sciences include disciplines like sociology, politics, and anthropology. The natural sciences include physics, chemistry, and biology. By and large, those in the latter group have universally accepted principles (such as gravity, chemical reactions, microorganisms) that can be objectively and repeatedly demonstrated. These are known as proven truths. Where such demonstrations cannot be done, there are usually working theories that are constantly being refined. If natural scientists happen to disagree, they are confident that through perseverance in experimentations, truth will in due time emerge and dissolve the disagreement.

On the contrary, social scientists are in constant disagreement. This is because they do not have any universally accepted principles. No social science theories can be put to objective and repeated testing; therefore, proven truths cannot be developed. “Truth” becomes a matter of opinion, and different scholars often hold different opinions. Thus, says Canadian sociology professor [Kenneth Westhues](#) of the University of Waterloo, “Different sociologists have different principles—assumptions, predispositions, basic ideas underlying what they

say and write on specific subjects.”

Since social science has no unified principles, does that mean there is no way to objectively evaluate how well a society is doing? This article would argue that there is a way. Embedded in every modern society are four basic human conditions that originate from natural science, which can serve as objective metrics of societal health. Primarily, these metrics arise from the natural science disciplines of psychology and biology.

Knowledge arisen in any given discipline must be compliant with that of a more fundamental discipline. For a theory (a proposed new knowledge) in a discipline to be considered credible, it has to be compliant with the already established principles (or working theories) of a more fundamental discipline. For example, it would be difficult to consider a physics theory credible, if it disobeys algebra (a principle of mathematics, a discipline more fundamental than physics). By the same token, one would more likely consider the discovery of a new virus (a biology theory) credible when it comes supported by a corresponding new RNA sequence (a principle of biochemistry, a discipline more fundamental than biology).

Here, our topic is about how best to evaluate society.

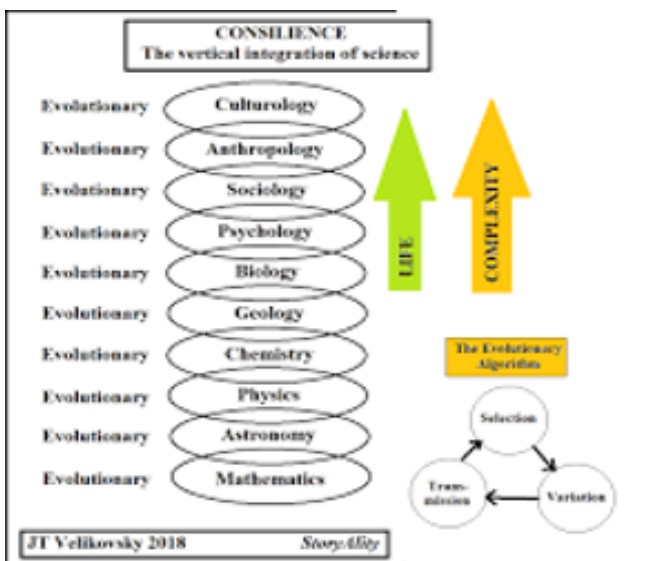
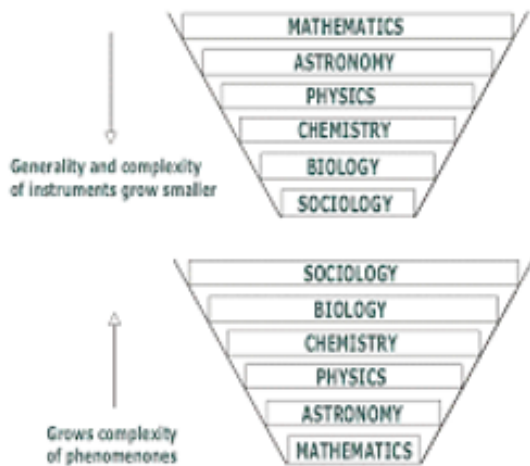
Since sociology is all about how human beings behave in communities, we should start by exploring the principles and theories of human behavior, namely psychology (a branch of natural science and a discipline that is more fundamental than sociology).

Using the above premise, we are now ready to derive a natural-science based method to objectively evaluate society. In this method, four human conditions (wealth, population, health, education) will be identified as manifestations of established principles/theories of human psychology and biology, which function effectively like the guts and backbones of society. If just one of them falters, the entire society can potentially collapse. How well each of them is functioning reveals clues about which “organs” of the society are thriving and which are failing. Effectively, we can consider them as the society’s vital signs.

By focusing on these vital signs, we should be able to assess the health of our society more accurately, thereby developing public policies more effectively, as well as conducting cross-cultural dialogues more meaningfully.

Knowledge hierarchy and compliance with fundamentals

As mentioned above, there is a hierarchy among the knowledge disciplines, each ranking according to its predecessor, with the predecessor always being the one that is more fundamental. Here, a picture is worth a thousand words. The graph depicted below (top graph) is from the 19th century French philosopher, [Auguste Comte](#), and that below is from the 21st century Australian communications scholar, [JT Velikovsky, PhD](#).



Aside from the addition of a few modern terminologies (such as psychology, anthropology), the overall structure of this hierarchy has not changed significantly in two hundred years, with mathematics still being the most fundamental discipline. Note that the discipline that is next to but more fundamental than sociology is psychology, followed by biology.

As alluded to in *Introduction*, the knowledge obtained from each discipline depends on that of its predecessor, though the reverse is not needed. For example, in order for a physics theory to be credible, it must obey the principles of mathematics. But, those mathematical principles will remain, irrespective of the validity of the physics theory. Therefore, it is always the discipline that is less fundamental that needs to be compliant with the one that is more fundamental. Every credible biology theory must obey the principles of biochemistry; every credible psychology theory must obey biology; and so forth. Hence, for our proposed sociology theory to be credible, it must obey psychology and biology.

Psychology

Psychology has few established principles, and there is none regarding what motivates human beings to behave the way they do. However, there is a resounding theory. First introduced by American psychologist Clark Hull in the 1930s, the Drive-Reduction Theory remained the dominant theory of human behavior for three decades. By the mid 1970s, proponents of the theory became somewhat disappointed that it could not fully explain all

human behaviors. The zeal of many psychologists who thought they had found an all-encompassing human behavior theory started to cool. Yet, to this day, psychologists still have not developed a theory with enough all-encompassing qualities to replace it. Although seemingly fallen out of favor, Hull's theory has had a primordial influence on later theories all through the remaining 20th century and into the early 21th. For example, the prominent 20th century Discrimination of Learning Theory by [Spence](#) and Hierarchy of Learning Theory by [Marslow](#) both have roots in Hull's theory. By the same token, the 21th century Homeostasis Reinforcement Theory by [Keramati and Gutkin](#), as well as the artificial intelligence theory of Self-Referential Model-Building Control Systems by [Schneider and Adamy](#) are both based significantly on the theory of Hull. Therefore, the Drive-Reduction Theory is still very much alive and is the topic of our following discussion.

Drive-reduction theory

Drives are the internal [forces](#) that motivate people to maintain homeostasis (stable physiological-mental state), which are categorized as primary and secondary.

Primary drives aim to maintain physiologic balance. Essentially, primary drives comprise thirst, hunger, and sex. The first two are for sustenance, and the third is for procreation. Overall, these drives ensure species survival.

Secondary drives come into play once primary drives are satisfied. These are learned behaviors that human beings believe will bring about mental satisfactions in life. Their propensity to fulfill such satisfactions is so strong that it has become a "necessity," in order to maintain a mental form of homeostasis, analogous to the physiological homeostasis in primary drives. However, as learned behaviors, these can vary considerably, influenced by factors such as tradition and religion.

This theory has many finer details, such as behavior prediction by motivation computations. However, we shall not belabor with these. Our aim here is only about how to apply the theory's most basic concepts to better understand society. In a nutshell, primary drives are about what we humans need, while secondary drives are about what we want.

What we need (primary drives)

As alluded to above, in order to maintain sustenance homeostasis, each human being (as a terrestrial mammal) is constantly trying to ensure enough supplies of fresh water and food, motivated by the drives of thirst and hunger. Furthermore, to be fit for survival, he must also be successful in procreation. Thus, in order to maintain procreation homeostasis, he is constantly engaging in activities leading to offspring, motivated by sex drive. It is on the basis of primary drives that the first two metrics are derived: wealth as a measure of sustenance and resources, as well as population as a measure of procreation.

1. Wealth

In the cave dwelling days of our early history, the drives of thirst and hunger motivated us to be constantly finding fresh water and food. When we evolved to living in early societies, finding fresh water and food transformed into securing territories with such natural resources. By the time we started to live in complex societies (including most modern societies), territorial control further transformed into acquisition of money. Therefore, through the evolution of societal complexity, securing wealth has become today's

manifestation of the primary drives of thirst and hunger. Hence, the wealthier the people in a society, the closer that society is to sustenance homeostasis. By the same token, the poorer the people in a society, the more distant that society is from such homeostasis. In terms of societal health, the former is thriving and the latter is stressed.

2. Population

Unlike the drives of thirst and hunger, sex drive for procreation has not significantly changed through the evolution of societal complexity. For the individual, procreation homeostasis is measured by one's offspring and his capacity to generate more offspring. For society, it is measured not just by the society's population size, but also its collective capacity to maintain and potentially increase it. For example, while comparing two societies with the same population size, the one with an optimal childbearing demographic is thriving, whereas that with an aging demographic is stressed.

Here, we can see that our social-science compliance with the fundamentals goes beyond psychology, reaching one level further to biology. In the biologic laws of [survival](#) and natural selection, a population whose genetic representation in the world is increasing is biologically more fit, whereas one whose such representation is decreasing is less fit. If the latter is allowed to persist for too long, that population will risk being extinct. For this reason, population is the most important of the four vital signs of societal health (this will be elaborated on later).

What we want (secondary drives)

When our needs (primary drives) are met, we turn our attention to what we want, which is by and large guided by pleasure. However, pleasure can be learned, and the list of pleasures we can learn is endless. Consider food seeking as a behavior. On the surface, it seems to be a matter belonging to primary drive; however, seeking food that is cooked in certain ways would elevate the matter to secondary drive. A person who used to like bread baked one way can learn to enjoy it baked in several other ways. Through learning, people have greatly expanded the scope of their pleasurable wants to encompass vast areas, such as cooking, clothing, music, sports, religions, social systems, concepts of heroism, and many more.

Because people are by nature very different across the world, so are their wants. These wants can vary tremendously not only from person to person, but also from society to society, as well as from time to time in a given person or society. A persona adored at one time could become abhorred two decades later. A religion loved by one society could be loathed by another. A political system valued by one country could be despised by another. There are so many different wants, coming from so many different societies, as well as from different peoples within each society, that finding a common denominator among them to objectively measure secondary drives might be an impossible task.

Health and education

Fortunately, this vast commotion of human wants is only confined to the surface. Below that surface, anchored deep in the human psyche, are two common denominators that have remained unperturbed through time and across cultures. What we humans want the most in life are health and education. This is evident in modern-day polls as well as ancient scrolls.

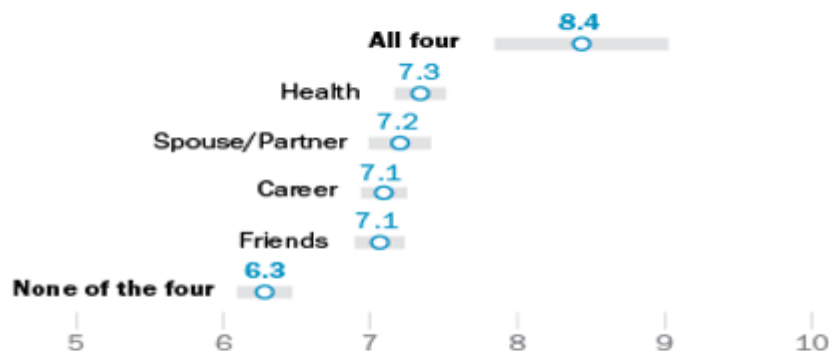
1. Modern-day polls:

In a [2017 PEW](#) research, when Americans were asked what factors they considered to give life most satisfaction, they named four and ranked health at the very top. Ranking second was spousal partnership, which in our discussion belongs to the primary drive of sex. Ranking third was job/career.

In a separate [PEW](#) report in 2016, Americans expressed how much they value the college diploma, as it often results in higher earnings and lower unemployment, suggesting that they consider education to be essential to ensuring job satisfaction.

Four areas of life universally associated with higher life satisfaction

Average life satisfaction rating among those who mentioned _____ when describing what gives them meaning in life



Note: These differences persist in a statistical model that controls for demographic factors and response length and tests the associations between mentioning one of 30 topics in an open-ended response and respondents' life satisfaction ratings on a 0-10 scale. The shaded region represents the standard error of each estimate, a measure of uncertainty.

Source: Survey conducted Sept. 14-28, 2017, among U.S. adults.

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That modern-day human beings highly value health and education should come as no surprise. These have been the forefront of what people want across the world for thousands of years.

2. Ancient cultures of Asia:

Although our world has many ancient cultures, only some of them have developed literature (an effective means to pass on knowledge to future generations). Among those, many have suffered significant interruptions (such as Egypt, Greece and Persia), mainly due to having been conquered by other powers. Fortunately, two of them have survived to this day more or less intact. The most well preserved is China. Although India had been colonized by the British for some 200 years, Hinduism as a religion and philosophy has survived essentially unscratched.

China

What Chinese people have been wanting for centuries can be seen overtly displayed in their homes, as well as at the front doors of businesses and shops in Chinese societies across the world. They are the symbols of the triad gods.



According to [Mary H. Fong](#), art history professor of the University of California, Davis: “Of all the popular gods in Ming-Qing China, Fu Lu Shou were among the greatest favourites of the people. Although they first appeared as a triad in art and literature produced for the upper echelons of society, they were soon accepted by all social classes, the literary elite as well as the working masses.”

In the picture above from left to right are the gods of Fu, Lu, and Shou. Fu grants happiness/joy, who is often depicted carrying offspring (secondary drive bridging over to primary drive). Lu grants social prestige (the kind that is attained through knowledge). The scepter on his right hand symbolizes high social status. The scroll on his left hand symbolizes the esteemed level of education he has acquired to achieve that status. Shou grants longevity/good health. His right hand holds the peach of immortality, while his left holds a staff on which is tied a gourd containing the elixir of life.

Interestingly, these three desires (Joy, Knowledge, Longevity) of the Chinese are similarly reflected in Hindu philosophy (the essence of Indian culture for thousands of years).

India

Among the seven major religions of the world, Hinduism stands out as the only one that confronts the [question](#): “What do people want in life?” While searching for what they want, it describes, people are initially guided by The Path of Desire and then by the Path of Renunciation, eventually coming to realize that what they [really want](#) in life are:

1. Being—we don’t want to die; we want life.
2. Awareness—existence is not enough; curiosity and knowledge is more important.
3. Joy—the feeling of well-being

The embodiment of good health, Being here represents our desire to live on. According to Huston Smith, [professor](#) of religion: “ Everyone wants to be rather than not to be...None of us take happily the thought of a future in which we shall have no part.” As for Awareness,

continues the professor: “Whether it be scientists probing the secrets of nature, a typical family watching the nightly news, or neighbors catching up on local gossip, we are insatiably curious. Experiments have shown that even monkeys will work longer and harder to discover what is on the other side of a trapdoor than they will for either food or sex.” Joy is simply the feeling described above.

Now, let us analyze the three elements of Joy/Happiness, Being/Longevity, Awareness/Knowledge closely to see how to properly incorporate them into our metrics to evaluate societal health, the kind of metrics with standards of objectivity similar to those in natural science. Although Joy/Happiness is truly part of what people want, it is also intangible and thus not quantifiable; therefore, we cannot objectively include it in our metrics.

Furthermore, as hinted by professor Smith, Awareness/Knowledge can come in various forms, ranging from neighborhood gossip to the daily news, to laboratory scientific research. Because many of these are not quantifiable, for the most part, they should also not be incorporated into our metrics. However, peoples’ educational statuses are quantifiable in most societies; therefore we shall choose Education to be the metrics for Awareness/Knowledge.

Being/Longevity is best represented by the metrics of Health. In most societies, information about their peoples’ state of health is regularly measured and reported.

In concluding our analysis of what we want (secondary drives), the metrics we have derived are Health and Education. When the people in a society are healthy and well educated, the society is thriving. When the people are not healthy and/or deficient in education, the society is stressed.

Metrics

In compliance with the principles and theories of psychology and biology, we now have a natural-science based methodology to better understand society through the four metrics of Wealth, Population, Health, Education. Next, we need to compile the actual data needed to compute these metrics.

In all developed and most developing countries, the following data are reasonably obtainable.

Wealth: various [measurements](#) of the economy, which are recognized by most economists, such as GDP, GDP per capita, NNDI, DINA, and [PPP GDP](#)

Population: size, age and gender demographics at national, provincial, and local levels

Health: life expectancy, infant mortality, successful births from desired pregnancies

Education: literacy rate, high-school-student rank in international competitions, percentage of population with university degrees or higher, Nobel Prizes received

The above measurements are examples only. They do not represent all or the only measurements that can or should be used. Different societies in different circumstances may wish to modify such measurements according to their specific needs. For example, in a society with a low literacy rate, measurements of Nobel Prizes and PhD degrees might not

be meaningful, whereas measurements of pre-university education might be more useful.

Government, attitude, and social priority

Since wealth, population, health, and education are four human conditions that can reliably serve as metrics of societal health, we can consider them as the society's vital signs. When these conditions are thriving (not stressed), it can be said that the vital signs are normal—the society is homeostatic. When a sign deviates from normal, the society veers from homeostasis and is feeling stressed in the corresponding condition. By attentively monitoring these signs, the government can efficiently identify areas where the society is not homeostatic and promptly institute remedies to resolve the corresponding stress.

Furthermore, since it is clear that we *can* evaluate societal health objectively, it would be unfruitful (probably also unwise) for us to insist on evaluating it subjectively. When criticizing societies, we should refrain from using language with ideology overtones, such as conservative, liberal, secular, fanatic, authoritarian, oppressive, and so forth. As mentioned in *Introduction*, because such criticisms are construed based on ideologies (not based on objective metrics), they are inherently biased.

It is not to say that ideologies do no matter in society. The point is that every modern society has certain basic issues that matter a lot more.

Consider the treatment of a patient in the emergency room. From first glance, the evaluating physician has already noticed that the patient is obese and has a large black mole on her left forearm. However, he would not allow these observations to distract him. He must prioritize his attention to reviewing her vital signs. In this case, her blood pressure is abnormally low and rapidly dropping, which he must treat immediately; otherwise, she could go into shock and potentially die. Concerns regarding her obesity and mole, while important in their own rights, can wait to be addressed later.

Likewise, in managing societal health, we should keep our priorities straight and always focus first on the four vitals. Only when every one of them is normal, do we have the luxury to consider venturing into some other social interests (ideology-based or otherwise). Furthermore, we must safeguard ourselves from overindulgence in these “luxury” interests, constantly making sure that such ventures do not end up costing us our vitals.

Example societies

Now, we shall assess the health of some existing societies. We will always begin by analyzing the vital signs, followed by noting any significant luxuries (nonessential social programs), ending with suggestions regarding how to help the society decrease stress and become more homeostatic.

This is simply a conceptual exercise to illustrate how the proposed methodology can be applied. The exercise is not intended to be all-inclusive, accounting for all the relevant variables that exist in these societies. Of course, in real-life situations, the more inclusive the better. By the same token, the way the four vitals are applied here is also not the *only* applicable way. Different societies may wish to fine tune the methodology to suit their specific needs according to circumstances.

The United States

1. **Wealth:** Because its GDP has been the highest in the world since [1871](#), one might think that it has been thriving. However, the income of the [lower half](#) of the nation has been stagnant for half a century; at least half of people are stressed.
2. **Population:** Given its geography, its population is relatively sparse and can afford to significantly increase. Indeed, it has been [growing](#) and is therefore thriving.
3. **Health:** For a rich country, its infant mortality record is appalling. According to the [2017 CIA report](#), it ranks behind 55 countries, including over ten positions behind Poland and Cuba. Its adults are not faring any better. Among thirteen [comparable](#) countries, the US life expectancy ranks the lowest and is still [decreasing](#). Stress level is high.
4. **Education:** It has won [more](#) Nobel Prizes than any other in the past 100 years. However, its high school students are [not up to par](#), often scoring poorly in international competitions. Some aspects here are thriving, while others stressed.
5. **Luxuries:** It has the largest military in the world and is still trying to grow it. In fact, the US [spends](#) more on its military than the next ten countries combined.
6. **Suggestions:** If all four vitals were normal and the Americans chose to spend more money in the military, that would be fine. In reality, the vitals are far from normal. There is severe stress in Health, as well as moderate stress in Wealth and Education. Therefore, some of the military budget should be diverted to help boost K-12 education, elevate the living standards for the poorer half of the country, and overhaul the healthcare system.

It is absurd that when it comes to healthcare for children, wealthy Americans are losing out to needy Poles and Cubans.

Japan

1. **Wealth:** In the past two decades, its GDP has ranked among the top three in the world, indicating a steady long period of thrive. However, its economy has [contracted](#) in the past few months. If this contraction continues, it will likely generate stress.
2. **Population:** The Japanese have been [aging](#) for half a century, with its population in steady [decline](#) for the past decade. By 2013, [diapers](#) for adults already started to outsell those for babies. The stress level is high.
3. **Health:** The life [expectancy](#) of its people has ranked among the top for decades. Its infant [mortality](#) rate ranks among the lowest in the world. This has been thriving.
4. **Education:** Japan's high school students score among the highest in the [PISA](#) competitions, and the country ranks number [six in](#) the world in the number of Nobel Prizes won, testifying that its entire education system is of good quality. Like that in Health, this is also thriving.
5. **Luxuries:** If Population were thriving, immigration (as a social program) might be less important. In reality, Population is severely stressed, where immigration can be a game changer. Unfortunately, Japan has been [reluctant](#) to accept immigrants.

6. **Suggestions:** An all out effort is needed to halt (preferably reverse) the population decline. As mentioned above, Population is the most important of the four vitals. As long as a society still has enough people, it can in due time improve the inadequacies of any or all of the other three vitals. However, no matter how well it is thriving in these three, if it does not have enough people, the society will soon die. Given the best available in-vitro fertilization technology of date, no country in the world can technologically (or ethically) mass produce human babies. Unless Japan can open its doors to rapidly and massively attract immigrants, the advancing age of its population could soon reach a critical point after which race extinction would become unavoidable.

Population decline is a serious (potentially fatal) societal stress, and Japan is not experiencing it alone. Many countries in the world, notably those in eastern Europe, have been experiencing similar stress. According to the 2019 World Population [Prospects](#) published by the United Nations, Ukraine, Lithuania, Bulgaria are each projected to lose more than 20% of its population by 2050.

Conclusion

The above discussion illustrates that Wealth, Population, Health, and Education are objective and reliable natural-science based metrics that can and should be used to evaluate societal health. Effectively, they serve as the four vital signs of society. When these signs are normal, the society is in homeostasis, meaning that it is thriving and experiencing no significant stress. If any of them deviates from normal, the society is stressed because it is no longer homeostatic. The more severe a sign is deviated, or the more number of signs that are deviated, the more stressed is the society. As the society's guardian, the government should proactively monitor these signs and keep them as normal as possible. It should also alert its people about any undue indulgence in (or prejudice toward) nonessential social programs. As we have seen in the above examples, even societies with supreme wealth and esteemed level of education can neglect some of their most basic needs. Therefore, the use of national resources should be prioritized to safeguard the country's most vital interests.

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Stephen E. Ling, MD is an [internist](#) from Santa Clara, California. Visit his website: www.forestgrace.net.

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