

## Perceptual Salience and the Creative Powers of a Free Civilization

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The gist of Hayek's interpretation of the economy is often taken to be his short essay, "The Use of Knowledge in Society" in which Hayek discusses the implications of the fact that crucial economic knowledge is diffused throughout a society. Because Hayek supports the price system as a means of disseminating information, neo-classical economists have generally understood Hayek to be discussing the fact that Hayek was pointing exclusively to the type of "knowledge" that may be transmitted throughout the economy by means of prices.

From this "arbitrage" interpretation of Hayek, then, one might summarize the primary Hayekian insight to be that because price information is distributed throughout a society in such a manner that central planners cannot have access to this information, markets therefore need entrepreneurs to play the role of arbitrageurs in the economy to discover from and profit by discrepancies in prices.

Indeed, insofar as the socialist calculation debate of the 1930s was conducted between Hayek and antagonists who conceptualized information in this manner, it is not surprising that this has become the dominant interpretation of Hayek's insight concerning the use of knowledge in society. An examination of Hayek's cognitive theory in combination with key elements of his social and political theory will show that the arbitrage theory of entrepreneurial activity represents only a small fraction of the manner in which Hayek understands that entrepreneurial creativity benefits society.<sup>2</sup>

### Hayek's Cognitive Theory

Both with respect to cognition and with respect to political/economic theory, the endless prospects for productive novelty in perception and value creation are the core Hayekian contributions to the 21<sup>st</sup> century. From this perspective, the full impact of the Hayekian perspective is not past, but has hardly yet begun to be perceived. Insofar as the mainstream of economic, political, and legal thought fails to incorporate the Hayekian contribution, the mainstream currents of academic thought are in danger of falling prey to the endless process of creative destruction. Hayek's work is not a dated reflection of

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<sup>2</sup> Readers familiar with Virginia Postrel's *The Future and Its Enemies*, a work that depends explicitly on Hayek, may note that the argument presented herein is a more abstract analogue to her argument, with a greater emphasis on social change as well. She advocates "dynamism" as a social/political perspective.

moribund arguments; it is a prophetic vision of a world of radical change that has not yet come into being.

Hayek's theory of cognition is a rarity insofar as he explicitly describes a process whereby new insights and new understandings come into being. Most cognitive theorists and epistemologists attempt to explain how we know what we know. But one of the most striking facts about Western civilization is that we are constantly knowing new things. Indeed, over time, we come to know dramatically new things. As a consequence, our perceptual and experiential reality is constantly changing at a dramatic pace, and yet we hardly realize it.

Hayek's theory of the ongoing creation of new knowledge is based on:

1. There are aspects of the world that we do not perceive and do not know about.
2. Experiences in which our existing perceptual/theoretical framework are contradicted, perceptually or intellectually, drive ongoing advances in our perceptual/theoretical framework.

Experiential freedom is thereby important because only by having new experiences do some individuals encounter situations in which their existing perceptual/intellectual frameworks are challenged in such a way that they are driven to create novel perceptual/intellectual frameworks. Some of these novel frameworks may then result in profound benefits for humanity (which ones do so, in a free society, is the result of a social evolutionary selection process). Hayek's contribution to 21<sup>st</sup> century economic, political, and legal thought is thus to focus our attention on ways to structure a society so that humanity continues to advance.

Hayek starts by explaining how it is that there are aspects of the world that we don't perceive. Hayek's view of perception is that it is not at all a static matter of receiving perceptual inputs through passive sensory channels. Instead, he recognizes that the perceptual inputs that are incorporated into our cognition are always pre-formed by our existing cognitive categories:

Every sensation, even the 'purest', must therefore be regarded as an interpretation of an event in the light of the past experience of the individual or the species.<sup>3</sup>

This in itself is hardly a surprising perspective, though it may have been when Hayek originally wrote it. The efforts of Artificial Intelligence (AI) researchers in the intervening years have abundantly shown that, in order for "perception" to be operational, i.e. to result in useful action of any kind, AI researchers have had to provide artificial minds with interpretive schema. Otherwise a "visual field" that consists merely of

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<sup>3</sup>F.A. Hayek, from "Pre-Sensory Experience and Pure Empiricism," the last chapter of *The Sensory Order*, published as "Philosophical Consequences" in *The Essence of Hayek*, Nishiyama and Leube, editors, pg. 226.

undifferentiated data is perfectly useless for action. Indeed, the toughest nut of all to crack may be to create artificial minds that can determine perceptual salience across a robust variety of contexts and situations; something that human minds do remarkably well.

But although human minds may perceive well, it is notable that in Hayek's theory of cognition they can still always learn to perceive better. Based on Hayek's theory of cognition, and given sufficient social and economic freedom, it seems likely that most humans in 2100 will be capable of perceiving more than do humans in the year 2005. I am aware of no other thinker who has articulated such a dramatically dynamic account of human cognition and perception; and yet, after one has become a Hayekian, this conclusion becomes almost self-evident.

Key to Hayek's view is the fact that we do not, at present, perceive everything:

“Every sensory experience of an event in the external world is therefore likely to possess ‘attributes’ (or to be in a manner distinguished from other sensory events) to which no similar attributes of the external events correspond. These ‘attributes’ are the significance which the organism has learnt to assign to a class of events on the basis of the past associations of events of this class with certain other classes of events. It is only in so far as the nervous system has learnt thus to treat a particular stimulus as a member of a certain class of events, determined by the connections which all the corresponding impulses possess with the same impulses representing other classes of events, that an event can be perceived at all, i.e., that it can obtain a distinct position in the system of sensory qualities.”<sup>4</sup>

The ‘attributes’ to which he refers may be compared to the algorithms for salience provided to an artificial mind.

For instance, in order to perceive a cubic block in order to manipulate it, a robotic mind needs to include an algorithm that assesses the perceptual patterns that mark the boundary perimeter of the block. Such an algorithm translates an undifferentiated mass of information into specific, separable ‘objects.’ The ‘attributes,’ however, do not exist in the data intrinsically; they are entirely determined by the nature of the algorithm. Different algorithms would produce different object boundaries.

This fact is sometimes difficult for humans to grasp because we so utterly take for granted our own perceptual algorithms that determine the salience of attributes. But an AI researcher cannot take such algorithms for granted. It turns out to be quite difficult to determine a complete general-purpose perceptual algorithm that has the flexibility of the human mind. For robotic minds at the present state of the art, different perceptual algorithms (even when using evolved software, the evolution process of which in effect

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<sup>4</sup> Ibid., pgs. 226-227.

determines the resulting algorithms) result in different perceptual capabilities and, consequently, different behavioral capabilities.

Note also that in Hayek's account advances in perception are driven by changes in cognition:

These 'attributes' are the significance, which the organism has learnt to assign to a class of events on the basis of the past associations of events of this class with certain other classes of events.<sup>5</sup>

It has often been noted, for instance, that whereas for a physicist the scratchy lines in a cloud chamber photograph are clearly the paths of specific subatomic particles, for the rest of us they are merely scratchy lines. The physicist has learned to assign a particular pattern with the event she categorizes as, for example, "the trail of a neutron." Learning to read cloud chamber photographs is a matter of learning to assign certain classes of events (the newest cloud chamber photograph) on the basis of past associations of events of this class (previous neutron trails) with certain other classes of events (his conceptual understanding of the characteristics of neutrons and the consequent predicted/anticipated characteristics of their trails on cloud chamber photographs).

In Hayek's cognitive theory, just as robotic minds today are engaged in an ongoing process of development in order to improve performance, so too the human mind is engaged in an ongoing process of development in order to improve performance. Although humans with normal capabilities can see and manipulate cubes well enough, there are an unlimited range of perceptual phenomena that are not yet perceived and thus on which we can not yet act. Just as we may observe a robotic toy with simple sensors somewhat blindly bumping up against walls before turning around only to bump up against a different wall, so too from the perspective of Hayekian cognition human beings at any particular point of development are merely agents that bump up blindly against obstacles that will appear perceptually obvious to them from a later stage of development.

Hayek identifies a cognitive process that results in learning in the sense of developing novel cognitive schema which allows individuals to perceive phenomena that had not previously been perceived at all:

"While there can thus be nothing in our mind which is not the result of past linkages (even though, perhaps, acquired not by the individual but by the species), the experience that the classification based on the past linkages does not always work, i.e. does not always lead to valid predictions, forces us to revise that classification. In the course of this process of reclassification we not only establish new relations between the data within a fixed framework of reference, i.e., between the elements of

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<sup>5</sup> Ibid., pgs. 226.

given classes: but since the framework consists of the relations determining the classes, we are led to adjust that framework itself.<sup>6</sup>

Experience is key to such a learning process

The reclassification, or breaking up of the classes formed by the implicit relations which manifest themselves in our discrimination of sensory qualities, and the replacement of these classes by new classes defined by explicit relations, will occur whenever the expectations resulting from the existing classifications are disappointed, or when beliefs so far held are disproved by new experiences. The immediate effects of such conflicting experiences will be to introduce inconsistent elements into the model of the external world; and such inconsistencies can be eliminated only if what formerly were treated as elements of the same class are now treated as elements of different classes.<sup>7</sup>

Thus recognized contradictions, among thoughts or between perceptual expectations and perceptual experiences, provide the animus for intellectual and perceptual development. If an experiment that is supposed to result in typical neutron trails repeatedly results in anomalies, the physicist may be driven to re-consider her perception, the experimental apparatus or set-up, or, ultimately her theories of physical reality.

The reclassification which is thus performed by the mind is a process similar to that through which we pass in learning to read aloud a language which is not spelled phonetically. We learn to give identical symbols different values according as they appear in combination with different other symbols, and to recognize different groups of symbols as being equivalent without even noticing the individual symbols.<sup>8</sup>

Thus by means of revised perceptual algorithms the actual manner in which we perceive reality changes; in order to avoid contradictions (either among existing beliefs or between expectation and reality), we may develop a more consistent cognitive framework that results in new perceptions that had not previously been possible. Previously inaccessible aspects of reality thereby become accessible to our perceptual apparatus. The process of continually perceiving new phenomena is the result of an ongoing individual and/or social process of creating ever more logically consistent understandings of reality.

Scientific revolutions are often characterized by dramatic changes of this sort. The centuries-long process known as the Copernican revolution began with a world in which humans perceived a crystalline sphere with points of light surrounding a stable earth and ended with humans perceiving themselves as tiny creatures on a tiny planet spinning through a vast universe with billions and billions of stars incomprehensibly far away. Of course, Hayek's cognitive theory implies that different interpretative frameworks will

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<sup>6</sup> Ibid., pgs. 228.

<sup>7</sup> Ibid., pgs. 228-229.

<sup>8</sup> Ibid., pgs. 228-229.

result in different perceptions (in the physiological sense of novel neural structures actually changing the manner in which sense stimuli are processed by the brain). Thus medieval observers of “the heavens” actually perceived crystalline spheres above, whereas Galileo began the process of perceiving distant material objects at great distances. We now perceive the Milky Way in a sort of “Star Trek” manner which would have been utterly incomprehensible to Dante. We do not perceive the sky at night in the same way as Dante.

Hayek is clear that the progressively more rationally consistent development of science constitutes a paradigmatic case of the phenomenon that he is describing:

Science thus tends necessarily towards an ultimate state in which all knowledge is embodied in the definitions of the objects with which it is concerned: and in which all true statements about these objects are analytical or tautological and could not be disproved by any experience. The observation that any object did not behave as it should, could then only mean that it was not an object of the kind it was thought to be.<sup>9</sup>

Without at present judging the validity of Hayek’s cognitive theory as a theory of scientific progress, it is worth noting that as a theory of creativity Hayek is concerned with the possibility of intellectual and perceptual stagnation: the possibility of tautological conceptual understandings that interpret the world in such a way that new phenomena effectively cannot be perceived.

Lest this seem implausible, note that throughout much of the 18<sup>th</sup> century, scientifically-educated individuals routinely observed phlogiston escaping from combusting substances, leaving a de-phlogisticated substance remaining. Burning typically involved smoke escaping from a body (the phlogiston) resulting in a reduction of physical size as a small bit of ash remained (clearly a substance had left the combusted body). Insofar as “that which was left during combustion” was defined to be phlogiston, even after it was discovered that some metals weighed more after burning scientists sought alternative hypotheses regarding the weight gain rather than to question the obvious existence of phlogiston. Only when Lavoisier provided a complete alternative account of combustion (which required a new, hypothetical, invisible substance, later known as “oxygen,”), which was eventually adopted because of its greater overall explanatory power, did a few scientists begin to quit perceiving the escape of phlogiston during combustion. If the phlogiston scientists had been able to define scientific expertise and control scientific advance, oxygen and modern chemistry might never have come into being. Science advances one funeral at a time.

It has become a commonplace among philosophers of science that interpretative frames define which data are perceived and how the data are interpreted. While this insight was original when Hayek originally wrote *The Sensory Order* in the late 1940s, it is no longer new today. Insofar as most academic debates take place within extended intellectual

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<sup>9</sup> Ibid., pgs. 231(?).

communities in which shared perceptual universes are mostly assumed, whereas interpretations of data may vary wildly, much of the energy involved in analyzing scientific and academic disputation has focused on the manner in which differing interpretative frameworks lead to differing assessments of the importance of various types of evidence. Less attention has been focused on novel perceptions of reality and how we come to experience such novel perceptions. Less attention still has been focused on the ways in which respect for existing expertise, in any field, ipso facto eliminates novel perceptual possibilities.

### **Understanding the Intellectual Niche Filled by Hayek's Theory of Creativity**

The fact of human creativity and innovation, especially as demonstrated by the cumulative progressive increase in the standard of living since the Industrial Revolution, might plausibly be considered the most striking fact about human life today. And yet creativity and innovation have not been easy to study or analyze; often they are considered to be rather inscrutable.

Even after two centuries of extraordinary innovation, the de facto assumption of humanity (despite much praise for innovation) is often that the future will be similar to the present. John Horgan's recent book *The End of Science* had the audacity to claim that fundamentally new perspectives on science had come to an end; a late 20<sup>th</sup> century analogue to the proverbial 19<sup>th</sup> century patent officer who wanted to close down the patent office because everything had already been invented.<sup>10</sup>

The fact that we don't know what we don't know has been a paradox from the time of Socrates. It has not been adequately appreciated that, for Socrates, that paradox was the impetus for developing new understandings. Hayek adds to this paradox by providing a plausible empirical model for how we gain understanding: our brain is actually re-wired to create new perceptions and concepts when we acknowledge inconsistencies in our experience or thoughts and then create new perceptions and concepts to reconcile those inconsistencies (The "Socratic method," properly understood, is a matter of bringing inconsistencies to light – and therefore enabling Hayekian creativity).<sup>11</sup> Lavoisier's "discovery of oxygen" is short-hand for a gradual, but dramatic, change in conceptual framework and scientific paradigm that led to changes in how reality was perceived.

Because Hayek's cognitive theory provides us with a physiological process in the brain that is hypothetically correlated with changes in perception of reality, on the assumption that there is more to perceive than we currently perceive, Hayek is the only theorist of whom I am aware who has articulated a specific proposed physiological process, based on an experiential sequence of events, which results in new perceptions and thus new theories and new inventions in the world. However partial and flawed Hayek's theory might be (and although neuroscientists generally work using a Hayekian-Hebb model of

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<sup>10</sup> John Horgan, *The End of Science*. To which Stephen Hawking replied "Garbage."

<sup>11</sup> Whitehead's *The Function of Reason*, Chapter Three, and Strong, *The Habit of Thought: From Socratic Seminars to Socratic Practice*, (Chapel Hill: New View), 1996, the chapter titled "Intellectual Integrity."

the brain, they have not verified this specific sequence), the niche filled by Hayek's theory is of the greatest importance.

Hayek provides a coherent account of novel perception that includes:

1. How our intellectual and perceptual categories tend towards homeostasis and thus prevent the casual recognition of novelty.
2. How a commitment to intellectual consistency, either on an individual or a social basis, can lead to recognitions of gaps in the consistency of our thought and thus to new insights.
3. Why therefore it is important to allow non-expert individuals to engage in activities in which they might discover new phenomena that cannot be adequately accounted for by the existing perceptions and conceptual categories of the experts.
4. Why competing organizations, rather than monopolistic government-sanctioned organizations, are therefore the best means of structuring society if we care about the creative advance of society.

Academia at present has not adequately incorporated any of the foregoing Hayekian theses into the mainstream of economic, political, and legal thought.

Of practical import is the consequence of learning Hayekian theory: i.e., incorporating a Hayekian perceptual frame into the way in which one views the world. I will try to articulate a few of the consequence of incorporating such a frame in the remainder of this paper. The specific consequences include:

1. A greater appreciation of the opportunity costs of restricting freedoms to innovate (which should lead to a better assessment of cost/benefit analyses of some kinds of regulation.)<sup>12</sup>
2. A greater recognition of the contingent and inadequate nature of empirical research in any field in which creativity and innovation may occur due to the fact that innovation may dramatically change empirical relationships (much, and perhaps most, social science research falls into this category).
3. A greater recognition of the "research" role of innovators and entrepreneurs due to the fact that most new knowledge is only available to those who take initiative in particular situations saturated with "local" knowledge, situations that are as unavailable to the academic researcher as they are to the central planner. This recognition, in conjunction with the other two, results in a new assessment of the role and value of research, especially social science research.

Cumulatively, as these three implications of Hayek's theory of creativity are integrated into the cognition of more decision-makers and thought-leaders in our society, the results

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<sup>12</sup> Bruce Benson, "Regulatory Disequilibrium and Inefficiency: The Case of Interstate Trucking," *The Review of Austrian Economics*, July 2002, pgs. 229-255, makes similar points from an Austrian perspective on the basis of a detailed empirical analysis.

will be dramatic changes. Hayekian thought will provide the foundation for a dramatically more dynamic, innovative, and productive world.

## **1. Appreciating the Opportunity Costs of Restricting Freedom**

If one wants to come to sensible judgments regarding how to assess present and future social policies, one ought to consider how to increase the probability that 2025, or 2050, will result in greater increases in human well being. Acknowledging, at least within an order of magnitude, the opportunity costs of restricting freedom to innovate should be a crucial consideration in all estimates of the costs and benefits of legislation. At present opportunities (and thus the associated opportunity costs) are invisible to academics. And yet an obvious implication of a society in which there exists a sustained record of innovation is that policies that hinder innovation impose opportunity costs equal to the unknowable costs of those innovations that did not occur.

Although those costs are by definition unknowable, due to the historical record it may be argued that those costs are very, very large in many fields of endeavor. The opportunity cost of not having discovered oxygen, had phlogiston scientists been able to control access to research, would include a significant portion of the increase in standard of living in the past two centuries. Had Michael Faraday, an amateur who was responsible for discovering the behavior of electrical fields, also been excluded from contributing to academic expertise due to his lack of qualifications, another significant portion of the increase in standard of living over the past two centuries would have been excluded. The historian Paul Johnson provides an extensive list of uneducated young men from working class backgrounds who played key roles in the early Industrial Revolution, including the chemist John Dalton, the engineer George Stephenson, one of the major inventors of locomotives, James Nasmyth, inventor of the steam hammer, Joseph Bramah, inventor of machine tools, patent locks, hydraulic press, beer pump, modern fire engine, fountain pen, and toilet.<sup>13</sup>

A proper assessment of the costs of occupational licensure would include the estimated costs of preventing the Industrial Revolution, or of preventing a significant fraction of the economic gains due to the Industrial Revolution. Because Hayek's cognitive theory includes an account in which intellectual homeostasis due to rule by experts is a likelihood, such speculations become grounded in a Hayekian matrix of cognitive and political theory. Similarly, insofar as much of the information processing revolution of the past forty years has been the work of amateurs and drop-outs (including Steve Jobs, Bill Gates, Linus Torvalds, and thousands of less well-known untrained individuals). A significant fraction of economic gains, now and into the future, due to the IT revolution would also not exist had only licensed experts been allowed to innovate. From this perspective, the opportunity costs of occupational licensing are extraordinarily high.

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<sup>13</sup> See Paul Johnson, *The Birth of the Modern: World Society 1815-1830*, especially chapter seven, for dozens of examples. See also Joel Mokyr, *The Lever of Riches*, for dozens of additional examples. Both books are entry points into a vast literature on the subject.

Insofar as the illusion exists that innovation is primarily a technical discipline, it might be imagined that such opportunity costs are only significant in science and engineering. But an implication of Hayek's cognitive theory is that creative possibility exists in all aspects of human life, not merely in the realm of technological innovation. One might well infer that we have seen less dramatic innovations in health care, education, and legal thought than in technology because during the period in which sufficient societal wealth existed to create large scale experiments in these areas government has been a dominant monopolistic force by means of licensing, budgetary control, regulation, and direct management of significant portions of the economy pertaining to health care, education, and law.

Outside the domain of technological development, the possibility of dramatic new discoveries about life originating independent of scholarly research and public policy are rarely considered.<sup>14</sup> The structure of academic research institutions, public policy debate, and the tradition of attempting social reform by means of legislation all conspire to make significant social possibilities invisible. Hayek shows how improvements in perception are ubiquitously available opportunities for creative advance. Every obstacle to spontaneously desired (and thus mutually beneficial) exchange is eliminates an opportunity for new perceptual salience and thus new innovations. Insofar as a given regulatory control eliminates millions or billions of potential mutually beneficial interactions, it thereby has killed millions or billions of opportunities for new discoveries.

For example, EBay, now one of the largest economies on earth, could not have been created in France because there was a law requiring auctioneers to be licensed. Had every nation had such a law, one of the most transformative and democratizing of all Internet applications would simply be non-existent. It would have been impossible for researchers to discover or estimate the cost of the non-existence of EBay and it is unlikely that any would have tried. If they had tried to do so, their efforts would probably not have gotten much attention or credibility. Because we can only obtain even an "order of magnitude" estimate in cases in which we do have such comparative situations, the estimated value that EBay has added to the global economy should be charged against the "benefits" of regulating auctioneers – or, more broadly, against the benefits of occupational licensure in general.

To take another example, consider the lowly paperclip – prior to its creation by Johan Vaaler in 1899, office papers were held together by straight pins. As a consequence, office workers frequently pricked their fingers. The invention and entrepreneurial distribution of the paperclip made life perceptibly better for office workers.

What is interesting about the paperclip as an example is that it is obvious that it could have been created earlier. The necessary "materials," a piece of wire, were in existence far earlier than 1899. Had the paperclip been invented earlier, simple means of hand production could have produced relatively expensive paperclips (they might have started out as a luxury item). As a market developed, then the machinery for producing cheap

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<sup>14</sup> Peter Drucker, always original, is one of the most striking high-profile exceptions to this generalization; see his *Innovation and Entrepreneurship*,

paperclips would have been a very modest technical challenge compared with those posed by the internal combustion engine, the dynamo, locomotive, or even the steam engine. Clearly neither scientific nor technical expertise was a pre-requisite for the development of the paperclip.

To take a very different example, consider the creation of microfinance by Mohammad Yunus. In order to overcome the problem that the poor cannot obtain loans because they do not have credit, Yunus first used his personal funds to offer small loans to Bangladeshi women in groups of five women, on the condition that if all five paid back the loans, then the women would be eligible for additional loans.<sup>15</sup> This simple system has proven to be remarkably successful and scalable; there are now similar microfinance programs in dozens of countries with millions of women and children benefiting. Again, no scientific or technical expertise was a pre-requisite for the development of microfinance.

To take a fourth example, it is well known that Steve Jobs obtained the idea for the mouse and the graphic user interface on a personal computer while touring the Xerox PARC research lab in Palo Alto in the late 1970s. Dozens of other people had seen these features, and yet Jobs was the first one to see the personal computer. Again, no scientific or technical expertise was a pre-requisite to envision the personal computer.

These examples begin to show why it is a mistake for academia to place innovation into a black box that occurs somewhere over in the engineering departments of universities. It is likewise an incorrect view to believe that at some point in the future experts in creativity or innovation will be able to substitute for millions or billions of interactions. Hayek provides an interpretation of reality in which creative possibility is ubiquitous: but individuals need real-world opportunities to interact in order to perceive specific situations in which the creative perception is possible.

Hayek cannot explain exactly why on-line auctions, the paperclip, microfinance, or personal computer was invented when it was, or exactly how the person who created it came to create it. What Hayek can, and does, provide is a general theory for why creative possibility exists and why, as a consequence, allowing for ubiquitous individual creative possibility should be an important public policy consideration.

In a Hayekian universe, the possibility exists of Pierre Omidyar (founder of EBay), Johan Vaaler, Mohammad Yunus, or Steve Jobs. Once such possibilities come into view a case may be made that our intellectual focus should shift from merely studying that which exists at present to considering how to create a world in which they which may be is more likely to come into existence.

Because this counter-intuitive perspective is profoundly important to Hayek's own view of the world and to the importance of Hayekian thought in the 21<sup>st</sup> century, it will be useful to study this world-view in some depth. This world-view is counter-intuitive because our na\_ve understanding is that "seeing is believing," and that therefore if we

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<sup>15</sup> See Mohammad Yunus, *Banker to the Poor*, for the complete story.

don't see it, it doesn't exist. Hayek's cognitive theory provides a clear, compelling, coherent account of precisely how it might be the case that what any one of us, or any group of us, doesn't see may well exist – and may well be perceived or be perceivable by another human being, somewhere, someday. Hayek's cognitive theory defeats the thesis that “seeing is believing” and more broadly that empirical evidence is conclusive in any domain in which creativity and innovation may impact the data.

## **Recognizing the Contingent and Inadequate Nature of Empirical Research**

Empiricism is the foundation of modern science. Social science, founded in an attempt to imitate the physical sciences, is likewise founded on empirical research. Given the various unverifiable hypotheses presented in the social sciences, Popper's insistence on “falsifiability” through empirical evidence remains a sound means of differentiating theoretical structures that deserve to be taken seriously vs. those that do not.

Although there are important controversies regarding the manner in which auxiliary hypotheses can prevent a given theory from being falsified, much empirical work in the social sciences does not remotely conform to a falsifiability standard. Richard Feynmann's judgment regarding educational research is not far off the mark:

In the Solomon Islands, as many people know, the native didn't understand the airplanes which came down during the war and brought all kinds of goodies for the soldiers. So now they have airplane cults. They make artificial landing strips and they make fires along the landing strips to imitate the lights and this poor native sits in a wooden box he's built with wooden earphones with bamboo sticks going up to represent the antenna and turning his head back and forth, and they have radar domes made of wood and all kinds of things hoping to lure the airplanes to give goods to them. They're imitating the action. It's just what the other guy did. Well, a hell of a lot of our modern activity in many, many fields is that kind of science. . . . The science of education, for example, is no science at all. It's a lot of work. It takes a lot of work to carve those things out, those wooden airplanes. But it doesn't mean that they are actually finding out something.<sup>16</sup>

In astronomy, small deviations in planetary orbits lead to the discovery of new planets and comets. Astronomers, physicists, and chemists pay attention when empirical results deviate even slightly from theoretical predictions. Feynmann is critical of “the science of education” and other fields because, unlike the hard sciences, no one expects a small discrepancy between theory and observation to result in major new discoveries. Popper's theory of falsifiability was inspired by Einstein's willingness to put his theory of special relativity on the line in 1919 when a solar eclipse allowed for the measurement of the extent to which the sun's gravitation bent rays of light – and by the fact that Marxists, Freudians, and others had nothing like a “critical experiment” in mind.

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<sup>16</sup> Richard Feynman, ???

It is often argued that, due to the nature of human beings, it is inappropriate to expect such rigor from the social sciences. By focusing on change, Hayek provides a deeper reason not to expect such rigor: human agency can change the nature of human perceptions and thus of future human agency.

The fact that human society can change is, in itself, a banal and obvious notion. And yet it is a banal and obvious notion that has not been incorporated into most social science research because if it did it would only serve to underline the contingent and inadequate nature of empirical research in the social sciences. Mohammad Yunus' creation of microfinance has resulted in dramatic changes in those Bangladeshi villages in which Grameen Bank lending exists. Numerous facts concerning social relations in those villages have been made obsolete by Grameen Bank lending. By giving loans to women rather than to men, by injecting capital into the villages, by supporting cell phone ladies (entrepreneurs who own a phone and sell calls by the minute), by requiring latrines, and in dozens of other ways, "facts" about Bangladeshi village life are "facts" no more.

Most empirical work in the social sciences today is premised on a static notion of empirical reality that fails to take into account those potential future empirical realities which do not yet exist, but which may be fundamentally different from present empirical realities. Just as any social science studies measuring the rate of pin-pricks among office workers would have been rendered obsolete by the creation of the paperclip, so too social science studies that measure equivalent features of existing society may be rendered obsolete in the future.

The great mass of empirical research on classroom learning, for instance, should be understood in the same contingent manner that research on the number of pin pricks among office workers in the 1890s should be regarded now – well, yes, prior to the invention of the paperclip, this kind of research may have had some validity, but it is perfectly irrelevant today. NCLB, for instance, requires that public schools hire "highly qualified" teachers because "research" allegedly shows that such teachers produce better results than do "less qualified" teachers. And yet there are certainly individual "less qualified" teachers for whom this generalization is not the case. In an education market, it seems quite possible that a different standard of "qualified" teacher could produce as good or better results than to existing "highly qualified" teachers. Yet this type of consideration, obvious from a Hayekian perspective, has (to the best of my knowledge) never been acknowledged in mainstream discussions of educational policy.

The Hayekian vision of society threatens the core of the academic research project in the social sciences. Instead of a vision of society in which social reality and policy is defined by research statistics produced by the professors who obtain the most citations in academic journals, we would have a society in which relatively simple, predictable rules allowed billions of human beings to act in a bewildering variety of ways. With respect to freedom of expression, we have allowed this pluralism. With respect to freedom of action, to a significant extent we have not.

Academics who focus on academic debate tend not to focus on the inadequacies of the debate itself. Their lives are lived in the hermetically (and hermeneutically)-sealed environment of their dialectical antagonists. Gaping inadequacies in the structure of academic debate itself might be largely invisible to them. Insofar as a core Hayekian legacy is a conceptual framework that reveals gaps such a framework might not strike them as a necessary or useful tool. Entrepreneurs, by contrast, might be more likely to perceive Hayek as providing an intellectually useful conceptual framework.<sup>17</sup>

### **The Research Role of Entrepreneurs**

Craig Venter's amazing deciphering of DNA, Burt Rutan's creation of a vehicle for viable space travel, and Fred Smith's development of overnight postal delivery are all different examples of entrepreneurial achievements that were not thought credible by responsible academics. Instead of spending a lifetime arguing about such things, these individuals just went out and did it. Sometimes, and probably far frequently than we realize, committed individuals creating new possibilities are far, far more effective than is endless academic debate.

The Hayekian argument for freedom of action is analogous to J.S. Mill's argument for freedom of thought and expression. Mill made a compelling case for freedom of expression in the late 19<sup>th</sup> century based on the notion that we can only discover new truths if we are completely unconstrained in our expression of our thoughts. This doctrine was tremendously appealing to intellectuals, and in the 20<sup>th</sup> century intellectuals largely succeeded in transforming the legal landscape so that they could say, write, and view whatever they pleased. The scale of change in accepted beliefs on this issue between Victorian Britain in 1870 and today is astounding.

Hayek is in many respects a Millian, but he goes more deeply and assertively with respect to the issue of freedom of action. Hayek realizes that, just as constraints on freedom of expression limit our search for the truth, constraints on freedom of action do so as well – but if anything, the limitations have greater consequences in terms of long-term reductions in human well being. But academics (at least qua academics) are writers, not actors, in the world. Thus they are sensitive to Millian arguments for freedom of expression but deaf to Hayekian arguments for freedom of action.

It has become an old joke that if two economists see a \$100 bill on the sidewalk that neither will bend down to pick it up - because it can't exist. Equilibrium economics has created a perceptual algorithm according to which there are no opportunities. The "efficient markets" hypothesis is the best-known application of this line of thought. According to the efficient markets hypothesis, market movements are caused strictly by new information, which is instantaneously incorporated into current stock prices. From

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<sup>17</sup> It is not a coincidence that two of the most insightful interpreters of Hayek have been entrepreneurial business people, Pierre Goodrich and Charles Koch. In Goodrich's "Memorandum" for Liberty Fund and Koch's (cite), one sees a sympathy for and understanding of Hayekian principles that is unusually sophisticated by any standard.

this perspective a Warren Buffett, who dramatically outperforms the stock indexes over a long period of time, is merely a random statistical anomaly.

From a Hayekian perspective, by contrast, it is possible that any given investor could perceive and understand either a particular market segment or larger market dynamics better than the average investor and, consequently, beat the market systematically. If this is the case, there would certainly be a strong incentive for other investors to learn these perceptual strategies so that she could also beat the market, and eventually as such strategies diffused more generally among investors there would no longer be any competitive advantage associated with such perceptual advances. Certainly many investors have studied Buffett's techniques and perspectives in hopes of replicating his success. Whether or not other investors have exhausted the gains associated with Buffett's perceptual technique, from a Hayekian perspective there are unlimited advances remaining in the future that will allow future Buffetts to, for a time, exceed stock indexes by means of more deeply perceptive understandings of people, companies, industries, the market, and society itself.

It is from this perspective that the social scientific attempt to quantify contemporary social phenomena (teenage pregnancy rate, broccoli consumption rate) as prelude to their implicit roles as public policy advisors seems remarkably limiting. Again, neo-classical economics is famous for its unrealistic focus on equilibrium economics. But the rest of social science seems equally blind to the process of entrepreneurial discovery. There is a tradition in sociology and anthropology of documenting declines in the well being of particular groups and of the destruction of indigenous cultures. But the concept of social entrepreneurship playing, potentially, a major role in society is as invisible to most social scientists as \$100 bills on the sidewalk are to neo-classical economists. If statistical analysis or verbal argumentation are all that one has at one's disposal, then social advising based on statistical analysis or verbal argumentation will appear to be suitably competent. What is invariably invisible in all scholarly analysis are those opportunities for creation such as those exhibited by Pierre Omidyar, Johan Vaaler, Mohammad Yunus, and Steve Jobs.

Hayek's statement regarding the disappearance of data may be applied again here:

The sense data, or the sensory qualities of the objects about which we make statements, thus are pushed steadily further back; and when we complete the process of defining all objects by explicit relations instead of by the implicit relations inherent in our sensory distinctions, those sense data disappear completely from the system."<sup>18</sup>

Insofar as academia believes that it is the most important source of understanding about the world, information that contradicts that conclusion become invisible. Virtually all of academia ignores the Hayekian emphasis on entrepreneurial creativity in the real world. This conclusion is one that is most unsatisfying to academia; it is a statement about the

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<sup>18</sup> Hayek, "Philosophical Consequences," pgs. 230-231.

intrinsic limitations and blinders of traditional academic activity, especially in the social sciences.

From a Hayekian perspective, it is not only true that there are thousands of \$100 bills on the sidewalk; there are also an unlimited number of ways of improving life, all around us. When one sees the world through Hayekian lenses, one becomes more and more inclined to act, and to feel an urgent need for freedoms that will allow one to act, and less and less inclined to be persuaded by contemporary social science research (the information may be useful, but in a world of creative possibility it is never conclusive).

It is a striking fact that two of the most remarkable developments in development economics in the last twenty years, Yunus' micro-finance and De Soto titling and deregulation, originated outside the academies. Somehow the many thousands of pages of academic journal articles, and the millions of dollars in salaries paid to development economists, did not generate these ideas.

These ideas were invisible to mainstream academics who mostly define success as publication. Academia has created a solipsistic reward system in which "success" is measured by means of academic publication. This paradigm does not necessarily prevent contact with the real world, but it also does not ensure contact with the real world. Moreover, the real world with which the academic is in contact is necessarily limited to those general "real worlds" which may be measured or through the particular local roles, which particular academics happen to experience. From this perspective, existing social science as practiced, especially given the implicit role as advisors to government control of society, is troubling.

### **The Creative Powers of a Free Civilization**

In 1956 Hayek attended a conference for which he prepared a paper titled "The Creative Powers of a Free Civilization." In this paper, Hayek makes clear his belief that freedom of action is crucial to the creation of new ways of life:

The manner in which we have learnt to order our day, to dress, to eat, and arrange our houses, to speak, write, and use the countless tools and implements of civilization, no less than the "know-how" used in production and trade, all furnish us constantly with the foundations on which our own contributions to the process of civilization must be based. And it is in the new use and improvement of whatever the facilities of civilization offer to us that the new ideas arise, which are ultimately handled, in the intellectual sphere.... Thus, the importance of freedom does not depend on the elevated character of the activities that it makes possible. Freedom of action, even action in humble things, is as important as freedom of thought and freedom of belief.<sup>19</sup>

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<sup>19</sup> Hayek, "The Creative Powers of a Free Civilization," in *Essays on Individuality*, Felix Morley, editor, pgs. 282-283.

Note how this view of social change is consistent with his cognitive theory published four years prior: “it is in the new use and improvement of whatever the facilities of civilization offer to us that the new ideas arise which are ultimately handled in the intellectual sphere . . . “ Freedom of action provides new experiences which might then provide an impetus for fundamental changes in our intellectual and perceptual capacities. De Soto and Yunus, Montessori and Waldorf, Venter and Rutan, EBay and Google, all change our perception of what is possible, what we should focus on, how we should take the next step.

We need to actually do things in order to discover what does and does not work. For Hayek, this is not merely a matter of pragmatic effectiveness; it is a fundamental impetus to epistemological advance. Only when we act (or when one six billionth of the world’s population happens to act in a highly unusual way) can we realize the gains from a new way to stretch our cognitive maps. Boundaries to action radically diminish creative possibility. Moreover, “action” should not be limited merely to the opportunity to take drugs or view pornography (typical Millian civil liberties): Most importantly of all, “action” must include the opportunity to create entirely new institutions, both individually and, through a process of spontaneous evolution, collectively. At present, the opportunity to create new institutions in education, health, and community formation are severely limited by law.<sup>20</sup>

Hayek is acutely, and uniquely, aware that any one of billions of minute changes in how we live our lives might result in dramatic changes in our intellectual, perceptual, or experiential capacities. Indeed, Hayek envisions the creative powers of a free civilization even transforming the most fundamental motivating ends of life:

Most of what has been said so far applies not only to man’s use of the means for the achievement of his ends but also to these ends themselves. It is one of the essential characteristics of a free society that its goals are open, that new ends of conscious effort can spring up, first with a few individuals or a small minority, to become in time the ends of all or most. . . We must recognize that even what we regard as good or beautiful is changeable . . .<sup>21</sup>

Hayek envisions a world of radical cultural creativity, in which entrepreneurial creation is not limited merely to technological innovation or material progress, but in which entrepreneurial creation, broadly construed, results in an ongoing transformation of society.

Conversely, Hayek is concerned lest the rule by experts undermine the very possibility of creative advance:

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<sup>20</sup>Because of the innovative possibilities in these areas, it is appropriate to launch a campaign to legalize markets in health and well-being. At present these realms are decriminalized, much as the small scale use of marijuana has been decriminalized in the Netherlands, but we would be better off if institutional building in these areas was fully legal.

<sup>21</sup> Ibid., pg. 284.

It is worth a moment's reflection as to what would happen if only what was agreed upon to be the best knowledge of society were to be used in any action. If all attempts that seemed wasteful in the light of the now generally accepted knowledge were prohibited and only such questions asked, or such experiments tried, as seemed significant in the light of ruling opinion. Mankind might then well reach a point where its knowledge allowed it adequately to predict the consequences of all conventional actions and where no disappointment or failure would occur. Man would seem to have subjected his surroundings to his reason because nothing of which he could not predict the results would be done. We might conceive of a civilization thus coming to a standstill, not because the possibilities of further growth had been exhausted, but because man had succeeded in so completely subjecting all his actions and his immediate surroundings to his existing state of knowledge that no occasion would arise for new knowledge to appear.<sup>22</sup>

Note how his concern here, in the policy realm, parallels his concern with perceptual limitations due to scientific understandings in the passage cited earlier from *The Sensory Order*:

Science thus tends necessarily towards an ultimate state in which all knowledge is embodied in the definitions of the objects with which it is concerned: and in which all true statements about these objects are analytical or tautological and could not be disproved by any experience. The observation that any object did not behave as it should, could then only mean that it was not an object of the kind it was thought to be.<sup>23</sup>

For Hayek, such tautological interpretations of experience, based on the most highly-regarded forms of expertise, constitutes the most severe danger to advances in human well-being. Not only will we reach a stage in which knowledge about better ways of living are not available, we will do so by adhering to the most highly respected and proven existing standards. We will not even be able to perceive that better alternatives exist.<sup>24</sup>

## **The Opportunity Costs of Not Understanding Hayek Correctly**

So what is the relevance of Hayek today?

Hayekian cognitive theory remains relevant because Hayek has described a means by which new intellectual and perceptual discoveries are made. His economic and political theory remains relevant because Hayekian freedoms are crucial in order to allow ever

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<sup>22</sup> Hayek, *Creative Powers* . . .

<sup>23</sup> *Ibid.*, pgs. 231(?).

<sup>24</sup> Edwin Abbott's *Flatland*, in which beings in a two-dimensional world persecute one of their own who claims to believe in the existence of a three-dimensional world, remains the best political parable with respect to this issue.

better discoveries to be made, implemented, and recursively encourage even more profound discoveries.

Where and how one chooses to focus one's attention largely determines what one sees, whether or not one recognizes that one's existing conceptual schema is inadequate, and whether or not one is likely to perceive something altogether new. One's existing conceptual schema, in turn, determines where one focuses one's attention and what factors in the environment are perceived as salient. Hayek is valuable today because his work focuses our attention on salient features of the economic, political, and legal world that might otherwise remain invisible to us. These features of the world that largely remain invisible have vast, unrecognized potential to improve human well-being in the 21<sup>st</sup> century and beyond.

The essence of the Hayekian argument for freedom is that in every case in which we do not yet have the required freedoms, the argument is necessarily speculative and counterfactual. Speculative and counterfactual arguments tend not to carry much weight in academic journals, when they are published at all. The very structure of academic publishing and academic careers prevents the most important Hayekian insights from being realized. The incentive structure of academia itself prejudices academics against Hayekian understandings.

Insofar as mainstream public-choice theory is premised upon rationally self-interested agents it emphasizes self-interest in a manner that is incompletely Hayekian. A more purely Hayekian interpretation of public choice theory would emphasize the informational discrepancy between government decision-makers and market agents without the more confusing and controversial self-interest assumption.<sup>25</sup>

But again, as marvelous as is the Hayekian informational interpretation of the price system, it represents a small fraction of representation of social, political, and economic life as presented by Hayek. The role that Hayek can, and should, play in contemporary intellectual understanding is to change the manner in which academics, and the public, regard empirical evidence and expert opinion in any realm in which human creativity is a possibility.

A Hayekian lens encourages one to focus on Yunus and De Soto, Montessori and Waldorf, Venter and Rutan, and on the remarkable history the creative powers of free civilizations where ever such civilizations have been allowed to come into being. The astonishing dynamisms of Periclean Athens, Renaissance Italy, the Scottish Enlightenment, 19<sup>th</sup> Century "yankee ingenuity," and Silicon Valley become the ultimate empirical evidence, capable of defeating mountains of static social science research that purport to study society. Analysis thereby shifts from arguing about the details of present states of affairs and proposed or implied "policy" recommendations (i.e. attempts at

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<sup>25</sup> See Bruce Benson, "Regulation, De-regulation, . . ." *Advances in Austrian Economics*, 2004 for a sophisticated elaboration of themes in this paragraph and access to an expansive literature on the differences between an Austrian and mainstream approach to public choice.

legislating correctives) and towards a focus on more abstractly rule-based institutional pre-requisites needed to encourage effective entrepreneurial solutions.

A dismissal of Hayek implies tremendous social costs insofar as academics and intellectuals continue to ignore or underestimate the opportunity costs of innovation; they continue to regard empirical research in the social sciences as a sound basis for policy analysis instead of a contingent, temporary state of affairs subject to creative change; and insofar as they continue to neglect entrepreneurial discovery more generally. Hopefully this paper will provide readers with some understanding of why some of us believe that broader exposure to and understanding of Hayek could result in extremely large wealth and well-being gains for humanity in the 21<sup>st</sup> century.