

Adam Smith on Humanomic Behavior¹

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Introduction: Perspectives on Adam Smith

In this address, I will focus primarily on Adam Smith, and what he contributes to our understanding of humanomics—a term that applies to market exchange but also quite seamlessly to personal social exchange.² If you are not sure whether social exchange is important to economics, you have to explain to me why Facebook has a pre market value recently estimated at about \$70 Billion.

Adam Smith would not have been surprised by Facebook, as I hope to illustrate by discussing the way he developed *The Theory of Moral Sentiments* (1759, 1790; hereafter, *Sentiments*)³ to account for his careful observations on the evolution of the rule structure that characterizes every cultural expression of human sociality.

The Scottish Enlightenment figures can be generically characterized by a common scientific thread: keen observation and the use of reason to model the postulated hidden order that could account for the world they observed around them.⁴ But the use of reason to model a hidden order is not the same thing as using it to model the behavior of presumed rational agents as in the program of neoclassical economics that continues to dominate economic and game theory in contemporary economics.

Their immediate intellectual forbearer was Isaac Newton who, to the astonishment of the scholarly world, explained their natural physical environment with a handful of rules of motion that were invisible to their awareness but brought order to sensible experience. Sometime prior to 1758, Adam Smith had written a draft of his “History of Astronomy,” published posthumously in Smith (1795), in which he stated that: “...(Newton’s) followers have, from his principles, ventured even to predict the returns of several... (comets), particularly of one which is to make its

¹ This is the text of the Keynote Address delivered by Professor Vernon L. Smith, Nobel Laureate in Economics, at the 2011 Annual Meeting of the Academy of Behavioral Finance and Economics at UCLA, Los Angeles, CA. The Journal and the Academy much appreciate Professor Smith for permitting them to publish the text of the speech in its presented format. Editor

² My colleagues, Jan Osborn and Bart Wilson of the English and Economics Departments teach a Freshman Foundations Course at Chapman University entitled “Humanomics: Exchange and the Human Condition” that challenges the notion that economics and the humanities are distinct unrelated disciplines. So would have Adam Smith.

³ The first edition of *Sentiments* was published in 1759; after four more editions without substantive changes, Smith prepared the extensively revised sixth edition. An account of these circumstances is best stated by quoting his biographer (Rae, 1895, p 425): “A revision of the *The Theory of Moral Sentiments* was a task Smith had long had in contemplation. The book had been thirty years before the world and had passed through five editions, but it had never undergone any revision or alteration whatever. This was the task of the last year of the author’s life. He made considerable changes, especially by way of addition, and though he wrote the additions, as Stewart informs us, while he was suffering under severe

illness, he has never written anything better in point of literary style.”

⁴ Smith carefully attributed the origin of this method of combining reason with experience to Galileo although he saw Newton as having achieved the greatest distinction in the development of the method. (Smith, 1795, pp 83, 104)

appearance in 1758. We must wait for that time before we can determine, whether his philosophy corresponds as happily to this part of the system as to all the others.” (p 103). Subsequently, quite unceremoniously, he merely added in a footnote that: “...the return of the comet happened agreeably to the prediction.” Smith is referring to Halley’s Comet which has returned on schedule about every 76 years since 1758.

It is difficult for us today to imagine what a mind-transforming event was this prediction and its magical verification. The significance of Newtonian science was captured in its moment by Alexander Pope: “Nature and Nature’s laws lay hid in night, God said let Newton be, and all was light.” But the important consequence for us today, in the study of behavioral finance and economics, was that the inspired Scottish geniuses asked: What other laws lay hid in night? And they launched the search for new thought models that could inform our understanding of the social, economic, legal and political framework whose order, like Newton’s, also surrounded them—an order that Adam Ferguson (1767) famously described as “the result of human action, but not the execution of human design.”

Although Smith revolutionized the way we see the world in creating pre-modern economics, he would have been disheartened by the vulgar popular distortions of his enduring message. Smith’s eighteenth century radicalism comfortably spanned, and indeed helped define, nineteenth and twentieth century liberal values. He opposed slavery, mercantilism, colonialism and empire when opposition to them all was unpopular. He championed the principle that a common street porter was not by nature the intellectual inferior of a philosopher. And he offered the illusive insight that the rich, with all their preoccupation with what—as a good Scotsman—he called the trivia of “baubles and trinkets,” were the custodians of wealth who preserved the seed corn against current consumption, thereby assuring those capital improvements that would create a better future even for the poorest. These principles would nourish 200 years of growth in per capita income and, as we now finally understand, Smith’s “improvements” were not so much only producer goods—tools and machinery—but rather innovation, the tools of the mind. (McClosky, 2010)

What happened to Smith’s innovations in socioeconomics?

Smith published two books in his lifetime: (1) *Sentiments* (1759), then extensively revised it in 1790 finishing the ms shortly before his death. Midway between these bookends he wrote (2) *The Wealth of Nations* (1776; hereafter *Wealth*). Soon after his death economic growth took off in Northern Europe, and Smith’s second book provided the intellectual foundation for understanding markets and that economic development process. The topic of moral sentiments and its comprehensive treatment of human socioeconomic behavior—directly relevant for understanding experimental and behavioral economic themes today—dimmed by comparison with Smith’s far more influential guide to understanding the takeoff in wealth creation.⁵

But ultimately Smith’s second book gave way to the marginal revolution of the 1870s. Jevons was able to derive the “law of demand” from diminishing subjective marginal utility enabling an articulation of why relative scarcity alone could account for different prices for different goods. Jevons’ innovation led directly to general equilibrium economics, and thereafter down to the present economics, was dominated by static equilibrium theory.

⁵ Any historian of economic thought can give you a list of the pre-cursors to *Wealth*, but Smith’s immense knowledge of the relevant literature and of practical affairs enabled a statement that endures as a unique treasure.

These new developments became the tail that wagged the dog. Lost or at least mislaid were the comprehensive behavioral insights in *Sentiments*, the relevance of those insights to understanding his *Wealth*, why both provided a natural lead-in to neoclassical economics and the circumstances in which the standard model of utility maximization (Max U) was appropriate and where it was not appropriate.

As we shall see, *Sentiments* was a treatise on the social foundations of human behavior. Smith was not a utilitarian: human motivation was based not on self-love,⁶ or benevolence, and certainly not on what many behavioral economists call social preferences.⁷ Behavior in *Sentiments* is about conduct, and its propriety or fitness with the rules of fair play. Reputation success in culture depended crucially on the individual's capacity for self command in controlling what others might see as the excesses of self-love. Prior to—perhaps prehistorically prior to—civil order, unjustifiable hurtful actions invoked resentment and punishment. What defined injustice, was violation of the rules of fair play, and provided the experiential social foundations that governed approved actions which became natural for civil government to codify. Hence, *Sentiments* provided the property right foundations that enabled markets to support knowledge specialization and wealth creation under third party enforcement rules freed from their consensual origins in close-knit groups ready always to discipline unacceptable actions. Civil government enforcement of property rights effectively lowers the transactions cost of interpersonal forms of punishing antisocial actions, but prior to this there must be a consensual foundation in experience for what constitutes hurtful actions.

My remarks examine what Smith had to say about human sociality in *Sentiments* using the familiar examples of trust and ultimatum games to illustrate how his propositions on beneficence apply in interpreting the results of research in these games as we have studied them in the lab and used them regularly in the classroom. Smith's framework of modeling suggests hypotheses that outperform the reach of those derived from *Homo oeconomicus* in anticipating the results of these experiments—results that have became part of the behavioral economic critique of the standard model. But Smith, one can reasonable infer, would have been a vigorous critic of both!

Building on this, I will use Smith's views on injustice to show how he saw property as a convention emerging first from social order-without-law and then gradually extended to the civil order of government. Property, as he thoroughly understood, is the bedrock of exchange, specialization and wealth creation—what Hayek called the extended order of cooperation, which surely grew far beyond anything Smith could possibly have imagined.

This intellectual and experiential history led to Smith's *Wealth* and his fundamental axiom of market behavior as a discovery process. That process, when combined with 20th century equilibrium theory—the supply and demand for non-durable goods—provides the behavioral and theoretical foundations for the first phase of experimental market economics.

But all does not end with the remarkable performance of markets for consumer non durables, which constitute 75 percent of national private product. I will also speak of the market for durable assets that command a smaller share of private product, but derive leveraged importance from their contribution to recurrent episodes of dynamic instability in national economies.

⁶ Smith only rarely uses 'self-interest.'

⁷ See Wilson (2008, 2010) for a critique of why utilitarian preferences are incapable of appropriately representing rules of conduct.

Human Sociality: Why it is not an anomaly that context is more important than stakes.

I will only briefly discuss here trust and ultimatum games in relation to *Sentiments*. (See Smith and Wilson, 2011 for a fuller treatment).

Consider the two person extensive form game in which Player 1 who has two options: opt out, giving each player \$20 cash, (Player 1 payoff, Player 2 payoff) = (\$20, \$20); or pass to Player 2 who chooses between (\$25, \$25) and (\$15, \$30).

In the traditional economic analysis between strictly self-loving (*Homo oeconomicus*), participants, Player 1 is predicted to accept (\$20, \$20) since if Player 1 passes to Player 2, she will defect, choosing (\$15, \$30) which is worse for Player 1.

But in *Sentiments*, actions are driven primarily by the propriety—approval or disapproval—of the conduct signaled by the actions, not by a utilitarian consideration for one's own payoff. It is the social circumstances that matter; payoffs enter only as part of judging whether they are appropriate in the circumstances. An action is a choice governed by general rules conditional upon the circumstances—rules that are derived from social propriety. Thus in *Sentiments* Smith states his socially derived Axiom of Motivation that “Man...desires, not only praise, but praiseworthiness...He dreads not only blame, but blame-worthiness;” these are the crisp dimensions of human betterment seeking that govern our conduct through self command. (pp 113-114)

Further, “We endeavor to examine our own conduct as we imagine any other fair and impartial spectator would examine it.” (*Sentiments*, p 110) The ‘fair and impartial spectator’ in Smith’s model is a metaphor for the judgments we form concerning the conduct of others and of ourselves as that conduct is revealed in our actions. ‘Fair’ is understood to imply that human social interactions must not constitute “...violations of fair play” (*Sentiments*, p 83). In making a choice, is the action ‘fair’ or ‘foul?’ *Action is about conduct, not outcome utilities.*

Consequently: “Our continual observations upon the conduct of others, insensibly lead us to form to ourselves certain general rules concerning what is fit and proper either to be done or to be avoided.”⁸ (*Sentiments*, p 159) The inner urge to take self-loving actions is constrained by general rules. Hence: “If he would act so as that the impartial spectator may enter into the principles of his conduct...he must, upon...all occasions, humble the arrogance of his self-love, and bring it down to something which other men can go along with.” (*Sentiments*, p 83)

The above social motivational process leads to what I call his

Beneficence Proposition 1: “Actions of a beneficent tendency, which proceed from proper motives, seem alone to require reward; because such alone are the approved objects of gratitude, or excite the sympathetic gratitude of the spectator.” (*Sentiments*, p 78)

This proposition predicts that the choice by Player 1 to pass to Player 2 will be interpreted as a voluntary beneficent act, exciting gratitude and constitute both a appraisable and a praise-worthy action; the action may be recompensed, but that is not the primary motive; rather recompense is acknowledgement of fair play; otherwise, the very concept of community is at risk.⁹ And indeed of 27 pairs—all “strangers” in the sense of anonymity with respect to each other—who play the above trust game, 17 Players 1 are observed to pass to their counterpart Players 2: Proposition 1 beats the self-loving equilibrium choice prediction by odds of 17 to 10.

⁸ Note carefully Smith’s choice of words: we are led “insensibly” (without conscious awareness), through “continual” social experience, to “general rules” that constrain our behavior.

⁹ I want to emphasize that this paragraph constitutes a change in how I (with my co-authors) have previously explained behavior in trust games—explanations e.g., in terms of “reciprocity” that were less deeply informed by *Sentiments*.

And 11 of the Players 2 choose (25, 25) over (15, 30), besting the self-loving defection prediction by 11 to 6. (McCabe, Rigdon and Smith, 2003)

Many behavioral economists have explained these choices as the result of other-regarding utilitarian or “social preferences” in which each player, it is said, gives up money for self in caring regard that the other receive more. This approach rescues the Max U hypothesis of traditional economics, by mechanically augmenting the sources of “utility” with other as well as own money to fit the data. But it fails to help us understand and model the process that produced the outcome, why intentions should matter, and how context defines the fitness characteristics of the rules of conduct..

In contrast, Smith’s proposition postulates that such actions “...which proceed from proper motives...” are specifically about intentions: these require Player 2 to see what Player 1 gave up in order to be able to interpret the choice as a beneficent action. This circumstance is tested in new experiments in which Player 1 does not have the “opt out” option of choosing (\$20, \$20), but rather, in full view of Player 2, can *only* choose to pass to Player 2. In this involuntary choice treatment Proposition 1 predicts that since Player 2 is insensible to any beneficence from Player 1, there will be no gratitude felt and nothing to acknowledge by reward, and hence choice will favor the self-loving (\$15, \$30). An independent sample of 27 pairs from the same community of subject “strangers” plays this involuntary version of the trust game. Now the results are just the reverse of what we observe above: 18 choose to defect and only 9 cooperate. (McCabe, Rigdon and Smith, 2003)

The combined results of these two games contradict outcome-based models whether of self-loving, altruistic or social preference choice. The results support the argument in *Sentiments* that people care about the implicit rules of propriety in which context, including intentionality, matters.

Sentiments also contains what I call

Beneficence Proposition 2: “Beneficence is always free, it cannot be extorted by force, the mere want of it exposes to no punishment...It may disappoint of the good which might reasonably have been expected, and upon that account it may justly excite dislike and disapprobation: it cannot, however, provoke any resentment which mankind will go along with.” (*Sentiments*, p 78)

In the intensively studied ultimatum game, pioneered by Guth et al (1982), Player 1 offers Player 2 a division ($x, M - x$) of an amount M (10 one dollar, or 10 ten dollar bills) made available by the experimenter to two people matched anonymously. Player 2 chooses to accept the division offered or reject it, in which case the outcome is zero for both. If both players are strictly self-loving in outcomes, Player 1 will offer the minimum amount, a one (or ten) dollar bill, and Player 2 will accept. Contrary to this prediction, the median offer is 50% of M and the mean about 45%, with rejection rates of less than 10% because most of the offers are generous enough to be accepted. (Camerer, 2003, pp 48-56),

Propositions 1 and 2 pose at least three key questions as to how ultimatum game choices might be interpreted as signals of intentions by people who have been recruited to the lab and learn what the experimenter has in store for them:

- Is Player 1’s offer a properly motivated act of beneficence?
- If Player 2 accepts the division is she rewarding beneficence?
- If she rejects the division, is she punishing “want of beneficence?”

The answer in *Sentiments* seems clearly to be “no.” Why? I think Smith would say that the game as described exposes subjects to a form of involuntary extortion. “Even the most ordinary degree of kindness or beneficence, however, cannot, among equals, be extorted by force.” (*Sentiments*, p 80). Depending on sentiments that are attached to involuntary extortion, it seems that the circumstances of the game violate or compromise Smith’s propositions on beneficence; they also qualify and limit interpretations in terms of own and other regarding preferences.

And indeed, across the immense experimental literature on the ultimatum game, what stands out is that the observations are far more sensitive to the context in which the ultimatum choice is embedded than to the stakes. The stakes have been varied by factors of 10 to hundreds—up to a month’s wages in certain populations. Camerer (2003, pp 60-61) has noted that the effect on rejections is modest, and the effect on offers is surprisingly small based on neoclassical modeling conventions.

Falk et al (2007) examine intentions in a study reporting the results of a variation on the standard ultimatum game in which Players 1 are constrained to offer only two alternative splits of 10 points (converted to cash in the final payments). The split that was fixed across all choices was (8, 2), and always offered against one of the following single alternatives in each game: (8,2), (10,0), (2,8) and (5, 5) (Falk et al 2007, p 22) For the case with no choice difference in outcomes—the alternatives are identical—and Player 1 can only choose to offer (8, 2), Players 2 reject 18% of them. This seems to be a “kill the messenger” response. Moreover, although Players 1 never offer (10, 0) when that is the alternative, Players 2 decline 9% of the (8, 2) offers. These choices are consistent with an aversion for playing the ultimatum game, not dissatisfaction with Player 1 choices, which treat Player 2 in the best possible way given the experimenters’ imposed constraints. Rejections may reflect ambiguity in how the social rules of fair play apply to the externally imposed structure of the game. At least some of the resentments invoked may be directed at the circumstances of play, not the person taking the action.

Are there context variations on the ultimatum game in which low offers are not perceived as a “violation of fair play?” The answer is yes when the game is embedded in a litigation game in which a Defendant makes a take-it-or-leave-it offer to the Plaintiff to settle out of court, by dividing the litigation savings. (Pecorino and Van Boening, 2010). The median offer is now only 8% of the savings in the embedded game; whereas in a control treatment, the traditional divide \$M ultimatum game, using subjects from the same pool yields a median offer of 50% of the savings. Similarly, when the ultimatum game is embedded in an exchange appended to an auction. (Salmon and Wilson, 2008) First, buyers submit sealed bids in an auction of a single unit offered by a seller; then the seller makes a take-it-or-leave-it ultimatum offer of a second unit to the highest losing bidder. Only 3.6% of the offers, profitable to the buyer, are rejected in a four-buyer experiment. The median surplus accepted is a mere \$0.39. The view from *Sentiments*, I would suggest, is that the process whereby the exchange of the second unit is reached is voluntary, controlled by actions acceptable as legitimate to most participants, and in consequence its otherwise extortionist features are removed.

Property (Propriety) Rights in *Sentiments*

Both David Hume and Adam Smith wrote perceptively on the origins and evolution of property rights. The central idea was that such rights in civil society adaptively emerged by consent from within our more intimate, neighborly social groupings. This perspective on

property was so well accepted earlier by John Locke and others that the expression ‘propriety rights’ not ‘property rights’ prevailed in English usage in the 17th century. By Hume’s and Smith’s time ‘property’ had become the English modifier for the vector of human rights associated with possession.

Smith’s key concept here, I call his

Injustice Proposition: “Actions of a hurtful tendency, which proceed from improper motives, seem alone to deserve punishment; because such alone are the approved objects of resentment, or excite...sympathetic resentment... (*Sentiments*, p 78) “Resentment seems to have been given us by nature for defence, and for defence only. It is the safeguard of justice and the security of innocence.” (*Sentiments*, p 79)

Smith explicitly argued that property rights under modern civil government originate from human resentment of actions that are in violation of justice: “Among equals...and antecedent to the institution of civil government, (each individual is) regarded as having a right both to defend himself from injuries, and to exact...punishment for those which have been done to him. (*Sentiments*, p 80). And, “As the greater and more irreparable the evil that is done, the resentment of the sufferer runs naturally the higher...”(p 83-4).

“The most sacred laws of justice, therefore, those whose violation seems to call loudest for vengeance and punishment, are the laws which guard the life and person of our neighbour; the next are those which guard his property and possessions; and last of all come those which guard...what is due to him from the promises of others.” (p 84)

Theft or robbery is more serious than the violation of promises (contract). Why? Because the former dispossess us of what we already have; the latter only frustrates our expectation of gain. (*Sentiments*, p 84) Conceptually, in the property right context, Smith is invoking the celebrated Kahneman and Tversky (1979) empirical proposition on the asymmetry between losses and gains. Quite generally he observes that we suffer more when we fall from a better to a worse state than we ever gain in rising from a worse to a better state. (*Sentiments*, p 213)

But Smith’s bottom line argument in *Sentiments* is that civil law simply encodes the experience-matured emergent social rules that had been found effective in preventing those actions that were intolerable—what people could not go along with—in their day to day interactive social experiences.

Thus, In Smith’s theory, justice is not something that society attempts to attain by explicit rewards; rather, justice is defined as the residual that is left to free and unconstrained choice after the culture has instituted a sanctioning system that punishes specific defined acts of injustice: “Though the breach of justice...exposes to punishment, the observance of the rules of that virtue seems scarce to deserve any reward.” (*Sentiments*, pp 81-2)

Hence, driving through a green light does not merit reward—innocence is your duty. Your citation and an appropriate penalty is the sanction for driving through a red light.

Smith concisely infers what must be the relative importance of the virtues of justice and beneficence if a culture is to be stable: “Society...cannot subsist among those who are at all times ready to hurt and injure one another... Beneficence, therefore, is less essential to the existence of society than justice. Society may subsist, though not in the most comfortable state, without beneficence; but the prevalence of injustice must utterly destroy it... beneficence...is the ornament which embellishes, not the foundation which supports the building...Justice, on the contrary, is the main pillar that upholds the whole edifice.” (*Sentiments*, p 86)

Behavioral economists need to take note that Smith’s views on the relative importance of justice and beneficence explains why people who, over time, free ride on contributions to a

public good, are dependably more generous in contributing to a fund—itself a public good—for punishing the free riders! (Yamagishi, 1986)

Markets in Adam Smith's *Wealth*—S & D experiments for non durables

In *Sentiments* Smith had dealt thoroughly with human motivation and the importance of societal constraints that control injustice. Consequently, when he wrote *Wealth* such property rights are essentially taken as given, and he adds little to his earlier treatment: “Where there is no property...civil government is not so necessary,” (*Wealth*, vol 2, p 203). And he speaks of “natural liberty” wherein “Every man, as long as he does not violate the laws of justice, is left perfectly free to pursue his own interest his own way, and to bring both his industry and capital into competition with those of any...order of men.” (*Wealth*, vol 2, p 687) But you have to read *Sentiments* to know what he meant by violating “the laws of justice,” by an individual pursuing “his own interest his own way.”

Against the backdrop of emergent rules disapproving of the violation of justice, and codified in law, what then was the driving force behind the nature and causes of the wealth of nations? The fundamental axiom in *Wealth* was the existence of a discovery process in civil society which I will call the

Discovery Axiom: “...the propensity to truck, barter and exchange one thing for another.” (*Wealth*, vol 1, 25)

It is this axiom that gives rise to specialization or in Smith's famous articulation: “This division of labour, from which so many advantages are derived, is not originally the effect of any human wisdom, which foresees and intends that general opulence to which it gives occasion. It is the necessary, though very slow and gradual consequence of a certain propensity in human nature which has in view no such extensive utility...” (*Wealth*, vol 1, p 25)

Smith's second book is about the consequences of this Discovery Axiom: the human propensity for exchange leads to prices. But once prices form people are calculation-ally enabled to discover what they like or don't like, what they want or don't want, what they wish to consume or to produce, and how they might innovate new things, new methods and better ways. Neoclassical economics turned this message upside down and inside out; it defined equilibrium conditional on preferences and technology (specialization alternatives) being given and known to individuals, and was mute as to how and what information was to be acquired. But dozens of millennia before Smith wrote, his axiom had driven human adaptations to the phenomena modeled in equilibrium economics.

In its most elementary form the axiom is nowhere better illustrated than in my personal experience whenever I finish grocery shopping at Trader Joes; the check out clerk always asks me, “Did you find everything you were looking for?” My reply is always the same: “Yes, and an even larger number of things that I was not looking for” by which I mean that I do not shop with an extensive list either in mind or written. I rely on a “search-recognition heuristic” as I survey the shelved merchandise, bringing to mind items I am short of or in need of, or if I see new items that attract me. Hayek must have had something like this experience in mind when he said that: “Rules alone can unite an extended order. ...Neither all ends pursued, nor all means used, are

known or need be known to anybody, in order for them to be taken account of within a spontaneous order. Such an order forms of itself..." Hayek (1988, pp. 19–20)

My shopping tale is part of every person's experience when they participate in one of the vast array of markets that confront us every day whether we enter online markets or shopping malls for food, clothing, furniture, securities, employment, plumbing services or Adam Smith's "baubles and trinkets." This experience seems to have altered little since the earliest evidence of trade, dating back long before the Common Era. What have changed are the financial and transactional technologies for interfacing with others in discovery processes that lead to gains from exchange and specialization.

What makes economics challenging for research and teaching is to understand how and why our experiences in a predominantly free society are capable of creating an order with desirable properties of the kind that Hayek is referring to; an order in which no one is in charge, but everyone influences the outcomes. When I first started teaching economics, I was very uncomfortable with how economic analysis struggled to make the connection between people's experience in markets and the equilibrium paraphernalia of the day in its reduced supply-and-demand form. Experiences like mine at Trader Joes were not, and still are not, plainly connected to how we develop and teach economic theory. My sense of this gap in my ignorance led me to conduct a supply and demand experiment in the classroom using the oral outcry two sided auction—what the finance books of the day called a "double auction." I knew nothing of such rule-governed procedures at the time and you could learn nothing about them in the economics literature so Balkanized was economic education. Without knowing it in 1956, I was applying Hayek's idea to economic education. I was pursuing ends and means not known to me, using methods untried by me to answer questions yet to be sharply formulated.

That teaching exercise ended up changing the way I thought about, researched, and pursued economic inquiry. Harvard educated, I expected that first classroom S&D experiment to show that competitive market outcomes were an abstract ideal state not achievable in the absence of what William S. Jevons called perfect knowledge: "A market...is theoretically perfect only when all traders have perfect knowledge of the conditions of supply and demand and the consequent ratio of exchange; and...there can only be one ratio of exchange of one uniform commodity at any moment." (Jevons, 1871;1888, p 87). I was wrong and so was Jevons.

The results of that first experiment are shown in Figure 1 (Smith, 1962, p 113) I thought these convergence results were too good to be true; an artifact of the symmetry of the S&D schedules. Eventually I did the experiment shown in Figure 2, and was led to reject that explanation. (Smith, 1962, p 124) These experiments and many hundreds since converged quickly to the predicted equilibrium under repeat play. The economic lesson in this was not just specifically that markets work better than had been expected, but the more general lesson for an educator was that *if you are not learning you are not teaching*. Essentially my students, as participants in these classroom experiments, were reeducating me. Also, without knowing it at the time, I was seeing the consequences of Adam Smith's Discovery Axiom; every person who walks into an experiment comes well endowed with Smith's built-in "propensity to truck, barter and exchange."

The Great Recession (see the discussion below) has recently taught me to call these examples markets for perishables because in the experiments, buyers and sellers realize immediately the surplus earned on each trade. So it's much like the markets for food and personal services. In such markets, the items are not re-traded and you already know, before you go to market that you are specialized either as a seller or a buyer. It turns out that these are very

important, but deceptively special, features of these markets and of the experiments that represent them. In the national economy, about 75% of private domestic product (Gross Domestic Product less Government Expenditures) is composed of consumer non-durable goods and services.

Asset Markets in Lab and Field: the source of economic instability?

In the 1980s experimentalists began to study asset markets. (Smith et al, 1988). Figure 3 shows an example of one of these declining fundamental value environments with a 15 period trading horizon. Subjects are endowed with cash and shares; the shares pay an average dividend of \$0.24 each period; so fundamental value starts at 360 and declines each period by this amount as the remaining number of dividend draws declines to zero at the end of the experiment. Just to be sure they don't forget, each period they are reminded of what the next-period remaining dividend value is. Figure 4 shows the mean trading price registered in each period for the same group who participate in three different sessions: inexperienced, experienced and twice experienced. In contrast with the S&D experiments, asset markets deviate very substantially from equilibrium and only gradually converge across all 45 periods in the three sessions.

How does liquidity or the size of the endowments of cash affect the size of the bubble? Figure 5 reports mean trading prices by period for a total of twelve experiments in which the liquidity ratio $L = (\text{Cash Endowment})/(\text{Share Endowment})$ is varied across the levels, 0.5, 0.75, 1.0 with four independent experiment subject groups participating for each level of L . Across the three treatments, the higher is L the bigger the amplitude of the bubble.

This is concordant with the well known performance of the credit fueled housing market in the Great Recession in which the inflation-adjusted median national price of homes rose steadily from 1997 until it peaked out in 2006 and thereafter began its decline.¹⁰ The housing mortgage market bubble had devastating consequences for the financial system and the national economy. Figure 6 plots Gross Domestic Product (GDP), and four of its principal components from the torrid years, 2003 through 2010: Non-durable consumption (C); Consumer durables (D); Non-residential fixed investment (I); and Housing investment (H). The relative magnitude of the movement in these measures is conveyed by scaling the data plotted in the chart: GDP and each component is computed as a percent of its value in the fourth quarter of 2007 when the recession (shown shaded) officially began. New housing investment (H) fell, from its lofty 2006 level 80% above that of quarter four, 2007, for seven straight quarters before the economy plunged into recession. What is unusual here is the severity of the downturn, not the fact that it was led by housing. Gjerstad and Smith (2010) examine the last 14 recessions including the Depression; 11 of these 14 recessions are preceded by a decline in new home expenditures, and every sustained recovery is accompanied by a recovery in the housing-mortgage market, with the exception (perhaps) of the Great Recession. These conclusions can be seen in the chart of Figure 7 plotting new housing expenditures as a percent of GDP for the eighty-odd year period that includes the Depression.

Here are the two important lessons for this presentation from Figures 6 and 7 and the charts like that of Figure 6 for past recessions in Gjerstad and Smith (2010): (1) housing, the most durable of consumer assets, together with its strong dependence on credit financing, is a source of persistent instability in the national economy—a feature that parallels the highly replicable asset trading bubbles studied in the laboratory, and illustrated in Figures 4 and 5; (2)

¹⁰ The discussion in this paragraph and the charts in Figures 6 and 7 are all based on Gjerstad and Smith (2010)

perishable goods, as represented in the national accounts by non durable consumption goods, is a dependable source of stable growth, and never surfaces as a trouble-maker for the economy—a feature that strongly parallels the highly replicable S&D convergence properties of the markets illustrated in Figures 1 and 2.

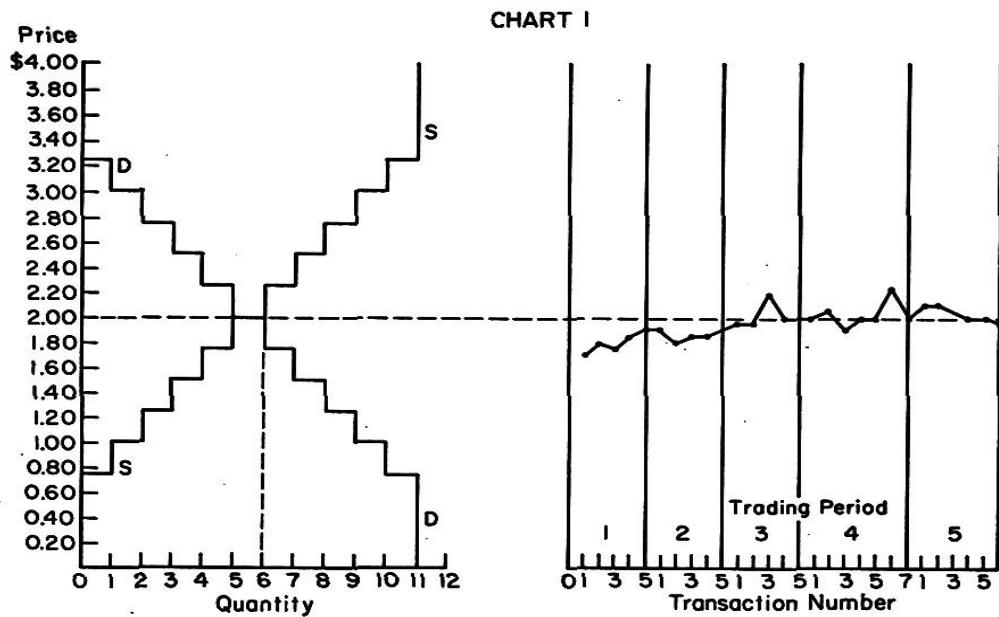
In 2005, before the housing bubble burst, 45 percent of first-time home buyers made no down payment at all--ZERO. Concerning this observation, Smith would surely say that "...being the managers rather of other people's money than of their own, it cannot well be expected, that they should watch over it with the same anxious vigilance with which...(they) frequently watch over their own." (*Wealth*, vol 2, p 741)

In summary

- Adam Smith was not a utilitarian; not in the sense of maximizing the self-interest, altruism, or, as in behavioral economics, social preferences.
- Rather, pleasure (pain) follows from the fitness (praise/praise-worthiness; blame/blame-worthiness) of our conduct with socially emergent rules of fair play.
- Beneficence merits reward because of the gratitude it invokes, but want of beneficence is not a likely source of resentment and punishment; it is freely given and cannot be extorted.
- Hurtful actions (injustice) merit punishment, while justice (want of injustice) merits no reward; i. e., justice constitutes what is left over after correcting for injustice.
- Smith's theory of human social conduct in *Sentiments* outperforms outcome based models in predicting the results from trust games, and provides a remarkably "new" (lost) perspective—the element of extortion—that appears to be relevant to understanding ultimatum game experiments.
- Smith's propositions account for property rights, and lead naturally into his *Wealth*. With property, Max U acquires legs to the extent that the group's rules are subject to third party (civil government) enforcement of promises defiled by defection.
- Smith's discovery process in *Wealth*—the human propensity for exchange—is alive and well in S&D experiments for consumer non durables, some 75% of private product.
- Instability in consumer durables, most prominently credit financed housing purchases, is echoed in laboratory asset experiments.
- Smith surely would say that this instability comes from far too much of other people's (bank) money.

Figures

Figure 1. Initial Supply and Demand Experiment



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Figure 2. The Convergence Observed in Figure 1 Was Not Due to Symmetry of Supply and Demand

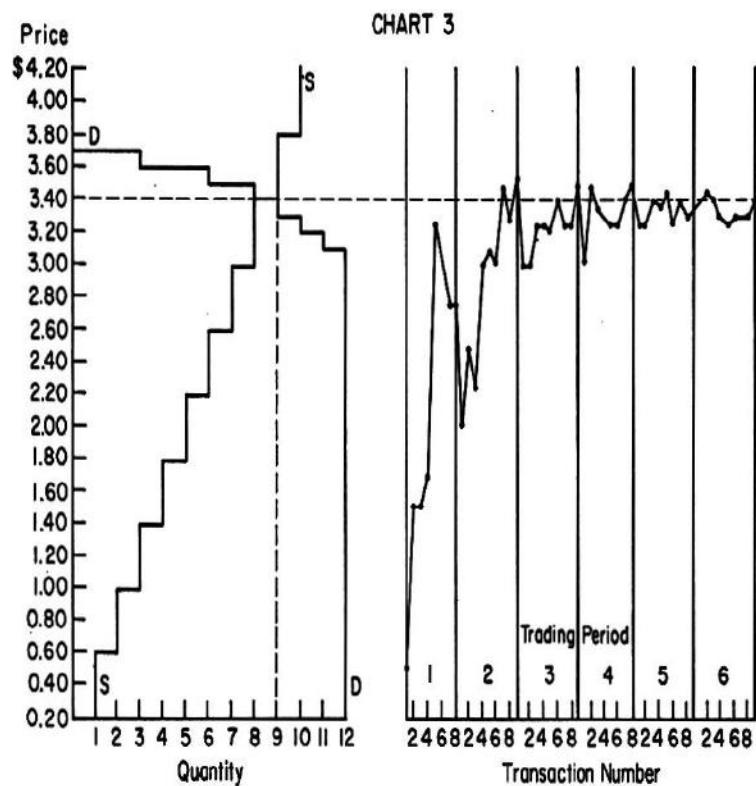
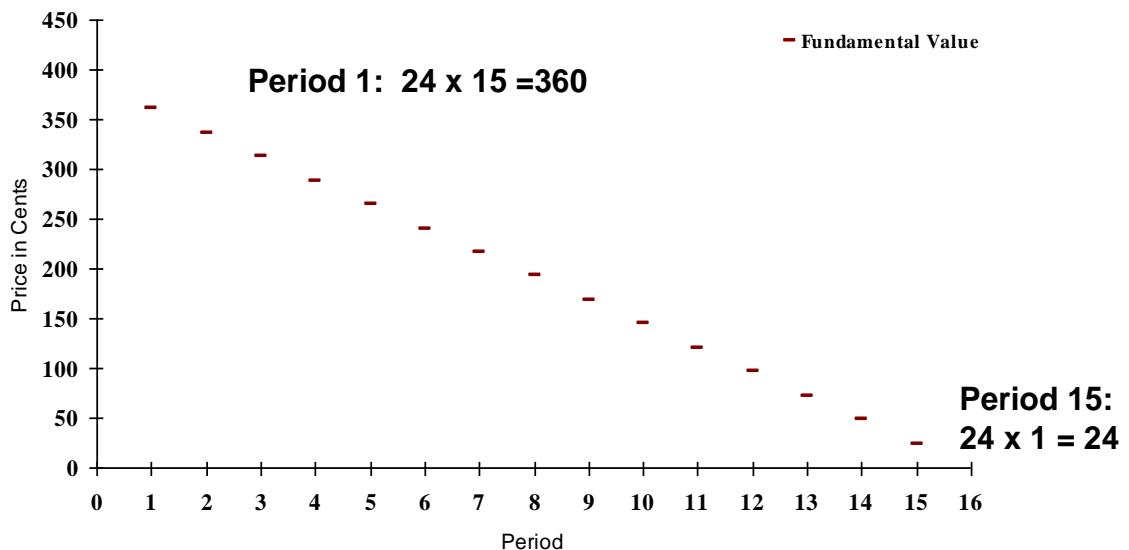


Figure 3. Asset Fundamental Value



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Figure 4. Effect of Experience on Time Series of Mean Trading Price

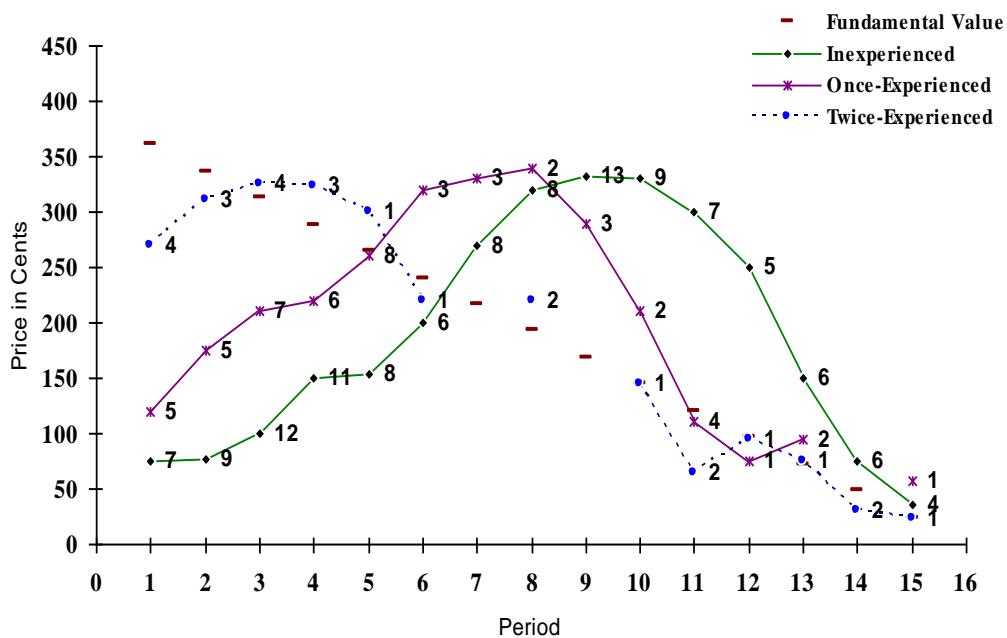


Figure 5. More Money, Bigger Bubbles

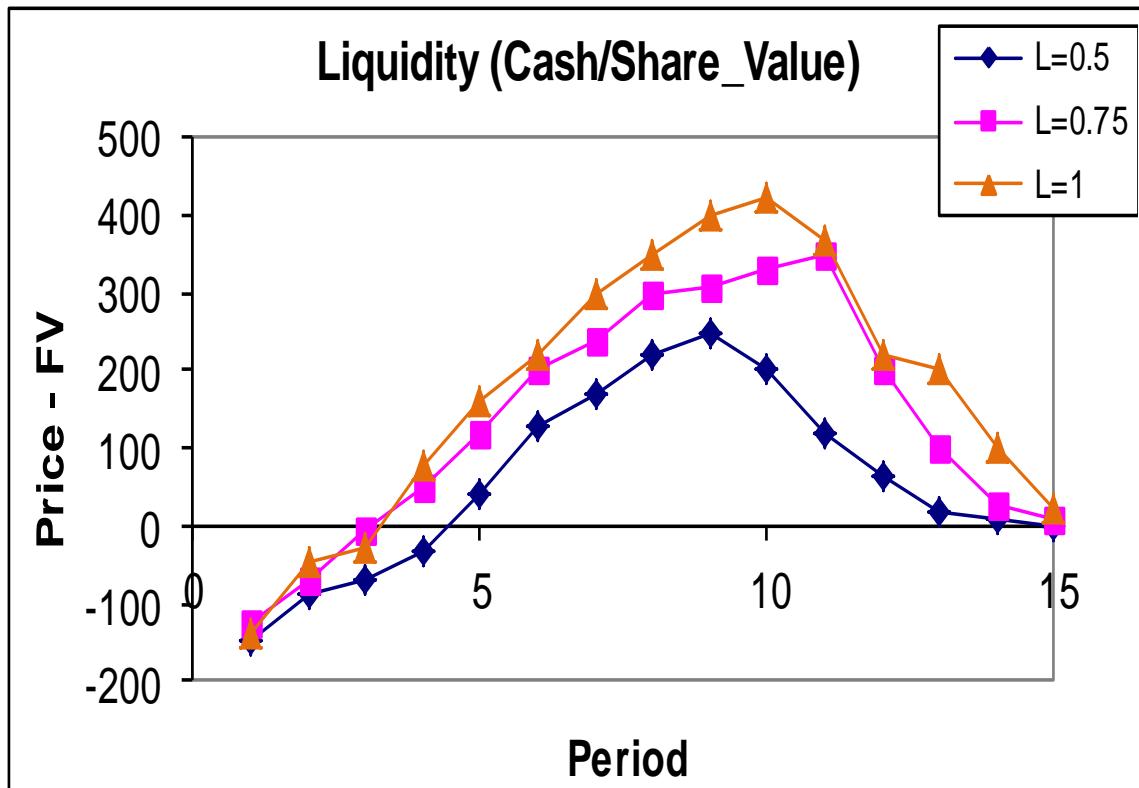
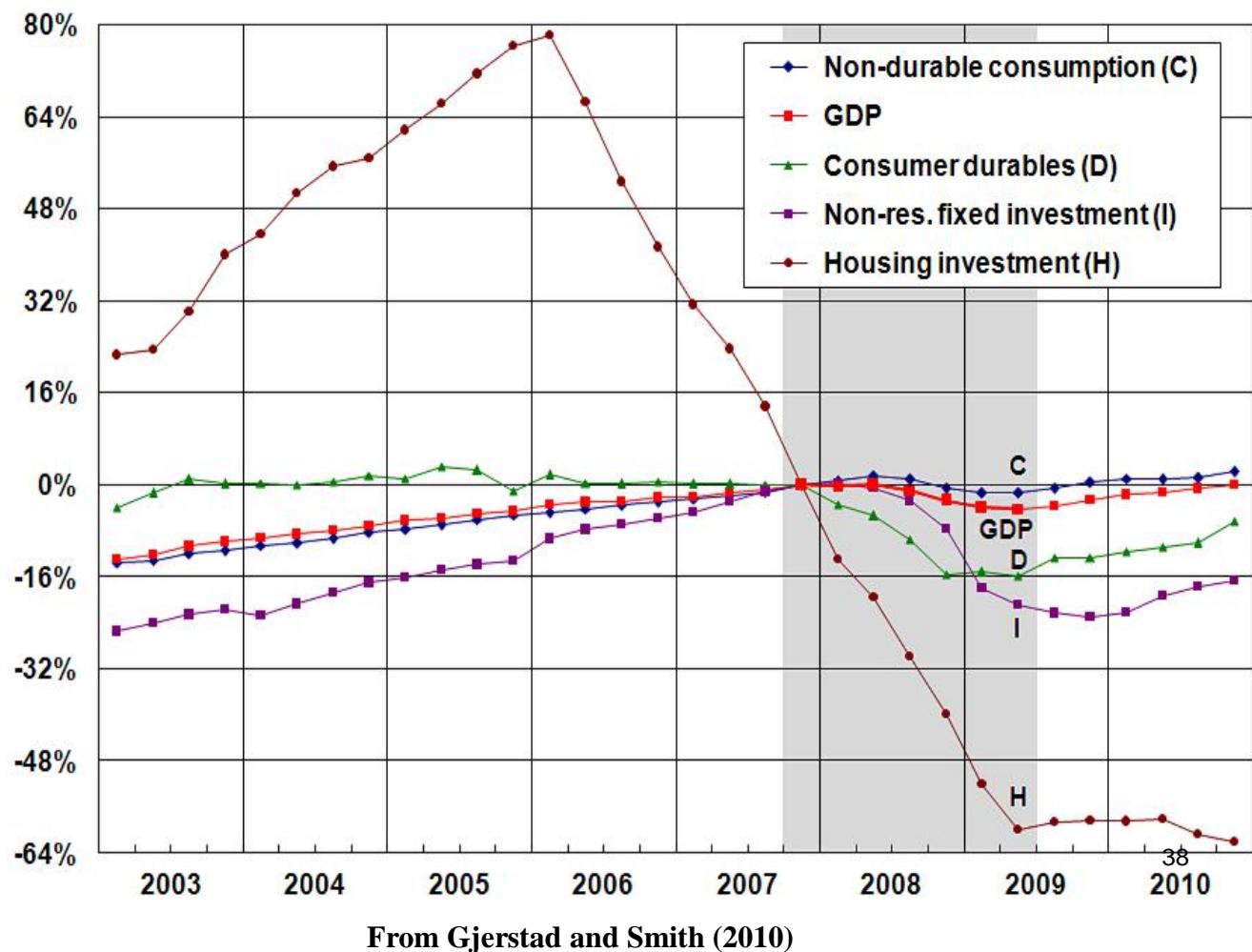
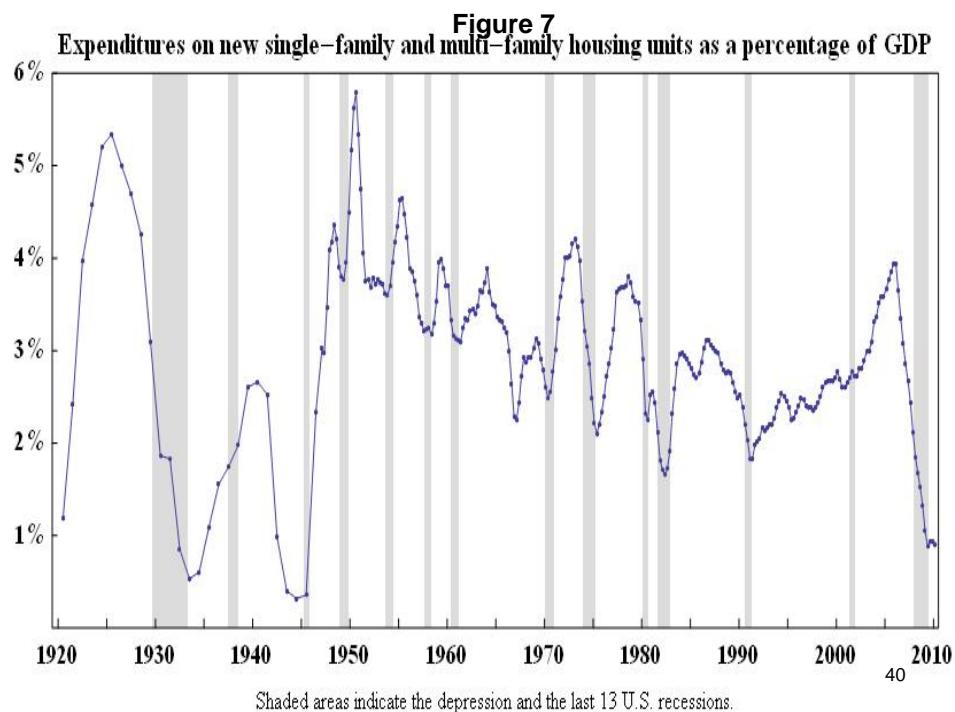


Figure 6. Components of Gross Domestic Product (GDP) Expressed as Percent of Their Measures in Quarter 4, 2007 from 2003-2010



From Gjerstad and Smith (2010)

Figure 7. Expenditures on New Single-Family and Multi-Family Housing Units as a percentage of GDP



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