

Tom Sawyer and the Myth of Fundamental Value

Dan Ariely *, George Loewenstein & ‡, Drazen Prelec *

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Correspondence and requests for materials should be addressed to:

Dan Ariely

E56-311

MIT, 77 Massachusetts Avenue Cambridge MA 02139

e-mail: ariely@mit.edu; Tel (617) 258 9102; Fax (617) 258 9102

** Massachusetts Institute of Technology, 77 Massachusetts Avenue Cambridge MA 02139 USA;*

‡ Carnegie Mellon University, 5000 Forbes Ave Pittsburgh PA 15213 USA

Abstract

A fundamental assumption in economic analysis is that economic agents know their tastes - their likes and dislikes - before choosing between options. This assumption supports many of the normative claims of economic theory, notably the claim that free market exchanges increase individual and social welfare. The paper begins by reviewing previous research showing that individuals' dollar valuation of ordinary products and experiences can be moved up and down via manipulations that are obviously irrelevant to pricing decisions (Ariely & Carmon, 2002; Kahneman, Ritov, & Schkade, 1999; Slovic, 1995; Tversky & Kahneman, 1974). Taking these findings as a starting point, the present paper asks a more basic question: Do people even have a pre-existing sense whether an experience is good or bad? Three simple experiments demonstrate that similar manipulations can influence whether a given experience is desired or avoided. The second experiment shows that the valuation of different durations of the experience is coherent with the original (manipulated) judgment: if the experience is good, then more if it is better, if it's bad, then more if it is worse. The third experiment shows that the results are not diminished if the random assignment of individuals to the two conditions is made transparent.

In a famous passage of Mark Twain's novel, *Tom Sawyer*, Tom is faced with the unenviable job of whitewashing his aunt's fence in full view of his friends who will pass by shortly and whose snickering only adds insult to injury. But as we know, when his friends do show up, Tom applies himself to the paintbrush with gusto, presenting the tedious chore as a rare opportunity. Tom's friends wind up not only paying for the privilege of taking their turn at the fence, but deriving real pleasure from the task — a win-win outcome if there ever was one. In Twain's words, Tom "had discovered a great law of human action, without knowing it — namely, that in order to make a man or a boy covet a thing, it is only necessary to make the thing difficult to attain."

There are no mysteries in what painting a fence entails. Hence, Tom's "law" challenges the intuition that whether a familiar activity or experience is pleasant or unpleasant is a self-evident matter — at least to the person participating in that activity. This intuition forms a cornerstone of modern economic analysis, which assumes that economic agents know what they like and dislike before confronting a choice between alternative outcomes. The assumed benefit of markets, touted most famously by Adam Smith, is that they increase people's welfare by allowing them to give up things they like less in exchange for things that they like more. But this assumes that people know what they like. In a world where people don't reliably know what they like, it cannot be assumed that voluntary trades will improve well-being, or that markets will increase welfare.

Recent research by psychologists and behavioral economists suggests that Twain's notions about human nature may be closer to reality than that propounded by economics (Frederick & Fischhoff, 1998; Hsee, Loewenstein, Blount, & Bazerman, 1999; Kahneman et al.,

1999; Slovic, 1995; Sunstein, Kahneman, Schkade, & Ritov, 2002). In a set of previous experiments we (Ariely, Loewenstein, & Prelec, 2003) showed that evaluations of goods and experiences have a large arbitrary component, yet once a response is given, other responses follow in a consistent fashion. In one study we sold consumer products ranging in value from \$10 to \$100 (computer equipment, wine bottles, chocolate boxes, books) to postgraduate business students. Students were presented with one product at a time and asked whether they would buy it for a price obtained by converting the last two digits of their social security number (an essentially random identification number) into a dollar figure – e.g., 34 became \$34. After this yes/no response, which we intended to serve as an “anchor” for their later responses (Chapman & Johnson, 1999; Johnson & Schkade, 1989), they were asked to state the maximum they were willing to pay for the product. A computer then randomly drew the price of the product, and the item was sold at that price only if it was lower than the student’s stated maximum (and if the student was eligible to purchase that particular product).

Although students were reminded that the social security number is a random quantity conveying no information, those who happened to have high social security numbers were willing to pay much more for the products. For example, students with social security numbers in the bottom twenty percent of the social security number distribution priced on average a ‘98 Cotes du Rhone wine at \$8.64, while those with social security numbers in the top twenty percent of the distribution priced on average the same bottle at \$27.91. Because the assignment of social security numbers to students is random, we can regard the two groups as identical with respect to their underlying tastes and knowledge of wine. Evidently, the same person can value a given item at \$10 or at \$30, depending on historical accidents such as answering questions about randomly generated prices.

If consumers' valuations of goods are so malleable, then why does one observe stable demand curves in the marketplace? A second aspect of the study provides a clue. If one looks across the different goods that were sold, one can see that, while students had little understanding of their absolute values, they did seem to have an idea of the relative values of the different goods. Thus, for example, all students priced a relatively fancy bottle of wine – a '96 Hermitage Jaboulet "La Chapelle" – higher than the already mentioned '98 Cote du Rhone. The students did not know how much they valued either wine, as demonstrated by the impact of the arbitrary social security number, but they did know that the superior wine was worth more than the inferior wine, and they priced the wines accordingly. A researcher who looked at our data, but did not know about the social security number manipulation, would conclude that these consumers were behaving perfectly in line with economic theory — the more valuable products were indeed priced higher than the less valuable ones. We referred to the combination of arbitrary absolute valuation combined with sensible relative valuation as "coherent arbitrariness." Coherence, because people are adjusting their valuations in a sensible, coherent, fashion when it is obvious how to do so, and arbitrary because they are making these adjustments from largely arbitrary baseline values.

Although the effect of the arbitrary social security number on valuations was dramatic, one could argue that the result crucially exploited subjects' uncertainty about what the goods were worth, either to them or in the market (for resale perhaps). A stronger test required an experience that could not be traded, but that could be experienced, and hence fully understood before the valuation task. For this purpose we selected brief aversive sounds, delivered to subjects through headphones. After a short exposure to the sound, the subject knew everything there was to know about the experience: there was no further need for market information, even

if such information were available. In an experiment representative of several reported previously (Ariely et al., 2003), we told subjects that they were about to hear an unpleasant sound played over headphones and asked them to consider, hypothetically, whether they would be willing to listen to the sound for 300 seconds in exchange for an amount that they composed from the first three digits of their social security number (e.g., 287=\$2.87). Subjects then stated the smallest amount of money they would accept to actually hear the sound for 100, 300, and 600 seconds, and, after each response, they would endure the sound and receive payment if their stated minimum fell below a randomly drawn price for that duration. Even in such a transparent setting, we found that valuations followed the ‘coherently arbitrary’ pattern: Subjects demanded about one and a half times as much to hear the 300 second sound as to hear the 100 second sound, and half again more to hear the 600 second sound. However, subjects with lower ending social security numbers demanded much less compensation than those with higher numbers.

These results showed that individuals did not seem to have a pre-existing personal dollar value for ordinary products and experiences. Taking these findings as a starting point, the present paper asks a more basic question: Do people even have a pre-existing sense of whether an experience is good or bad? Tom’s “law” suggests that they do not – that the exact same experience can be desired or avoided, depending on minor accidents of context and presentation. The three experiments presented here show that individuals can be made to exogenously classify some experiences as either positive or negative, depending on whether the preceding question asked them if they would pay or be paid for the experience in question. The results further show that after one such arbitrary response is given (as either positive or negative), other responses follow in a seemingly coherent fashion. Finally, in order to rule out two competing explanations, namely, that the effect can be attributed to the demands of the situation, or that

subjects use the form of the initial anchoring question to infer the quality of the experience, experiment 3 demonstrates that “Tom’s Law” holds even when the random assignment of individuals to either the ‘pay’ or ‘be paid’ conditions is made transparent (the assignment is set by the last digit of their Social Security Number, and both possibilities are presented on the answer sheet).

Experiment 1. To test whether there are experiences that individuals can perceive as either positive or negative, we conducted a study with 146 business undergraduate students enrolled in a large marketing class at the University of California at Berkeley. At the end of class, respondents were told that in a week’s time their professor (who they were familiar with) would be conducting a 15-minute poetry reading from Walt Whitman’s “Leaves of Grass.” Next, half of the respondents (N=75) were asked whether hypothetically they would be willing to pay \$2 to listen to their professor recite poetry. The other half of the respondents (N=71) were asked whether hypothetically they would be willing to accept \$2 to listen to their professor recite poetry. After answering one of these hypothetical questions, all respondents were told that the poetry reading scheduled for next week was going to be free and were asked to indicate if they wanted to be notified via email about its location and time. The goal of this question was to test whether the initial hypothetical question affected whether respondents viewed the experience as positive (meaning that they would like to attend if it was free) or negative (meaning that they would prefer not to attend if it was free).

The results in table 1 show that professor Ariely was not a great draw, at least as a reader of poetry: Only 3% of the respondents were willing to pay \$2 to listen to him recite poetry. However, most (59%) respondents were willing to endure the recital for \$2. More important for our purpose was the response to the second question. The percentage of respondents willing to

attend the free poetry recitation was 35% in the pay condition and 8% in the accept condition [$t(144)=4.0, p<0.001$]. The first response clearly influences whether individuals view the experience as positive or negative.

--- Table 1 ---

Experiment 2. After establishing the main result, Experiment 2 (conducted with a large undergraduate class at MIT) was designed to replicate Experiment 1, while also examining consistency within an individual across responses. Half of the respondents ($N=91$) were asked whether, hypothetically, they would be willing to pay \$10 to listen to professor Ariely recite poetry for 10 minutes, followed by a request to indicate their monetary valuations for 1, 3, and 6 minutes of poetry reading. The other half ($N=73$) were asked whether, hypothetically, they would be willing to accept \$10 to listen to professor Ariely recite poetry for 10 minutes, followed by a request to indicate the minimum they would be willing to accept for 1, 3, and 6 minute of poetry reading. A similar experimental procedure was also used in the domain of participation in decision-making studies. In this version we showed subjects an example question in a decision-making study (the Wason card selection task) and asked them, hypothetically, whether they would pay (or accept) \$10 for participation of a 10 minutes such study. After this initial hypothetical question, subjects were asked to indicate their monetary valuations for participating in such a study for 1, 3, and 6 minute.

The results in the figure show that valuations were strongly influenced by the initial question. Individuals in the pay condition were willing to pay for the experience, while individuals in the accept payment condition wanted to charge for the experience. Furthermore,

respondents consistently indicated higher sums of money for longer durations, whether it was a matter of paying for or being paid for the experience. Respondents did not have a pre-existing sense whether the poetry reading (or participating in a decision making experiment) was a good or bad experience for them, but they knew that either way “more” of the experience required more money.

---- Figure 1 ---

Experiment 3. Our third, and final experiment addresses the concern that the subjects might have taken the initial question as a cue about the quality or value of the poetry reading event. To that end we modified the procedure in two ways. First, before providing any response, subjects heard a one-minute sample of poetry reading from their professor (the experiment took place at a large undergraduate class at MIT). Direct exposure to a sample of the experience would diminish the significance of any indirect cues. Second, the instructions made explicit that there were two different conditions, and that the assignment to one or the other condition was random.

The experiment began with the experimenter announcing that in a few days he will conduct a poetry reading from Walt Whitman’s *Leaves of Grass*. He then read the first few verses of “Whoever you are holding me now in hand” which lasted about one minute. The full reading was promised to last fifteen minutes. The experimenter added that,

“The number of seats is fixed, but I would like to get something close to a full house. I am not sure how many of you are interested in attending this, so I have developed a scheme for allocating the seats to those who are most interested in the reading. “

The scheme was explained on the instructions sheet. Subjects were first asked to write down the last digit of their social security, and if the number was Odd to proceed immediately to Question 1 below, while if the number was Even to proceed to Question 2. Both questions 1 and 2 were printed on the same page, one following immediately after the other. In Question 1 (Odd digits only), they first filled inserted the last digit of their social security number into the sentence: “Would you attend the poetry reading for a payment of \$____,” and then answered it with either a YES or a NO. They also answered the same question with the dollar value increased by 50¢ and decreased by 50¢. In Question 2 (Even digits only), they inserted the last digit of their social security number into the sentence: “Would you pay \$____ in order to attend the poetry reading,” and then answered with a YES or a NO. They also answered the question with a 50¢ increase and decrease.

Subjects then turned to the back page of the questionnaire, which elicited a two-sided demand curve, ostensibly to help the experimenter determine whether he “will need to pay subjects for attending.” Here, the format was identical for both groups. Subjects indicated whether they “would attend the recital if paid \$10, \$9, \$8, ..., \$1, for free,” and whether they “would pay \$1, \$2, ..., \$10” to attend the recital. In all, subjects answered twenty-one pricing questions, which specified their personal value (positive or negative) of the recital to within +/- 50¢, within the range of +\$10 to -\$10.

The results are summarized in Table 2 below. On the initial question, a majority of subjects (63%) were willing to attend the recital if paid the dollar equivalent of their digit, but only 20% were willing to pay that equivalent to attend. However, the subsequent valuations of the reading were strongly influenced by the initial question: Of those who initially considered whether they would attend if paid, only 9% were willing to attend for free, in contrast to the 49%

who would do so among those who initially considered whether they would pay for the reading ($t(79)=4.48$, $p<.0001$). The mean value of the reading was negative for both groups, but much more so for the Accept group, which required on average \$4.45 in compensation to attend the reading, as opposed to the \$1.13 required by the Pay group ($t(79)=4.28$, $p<.0001$). Interestingly, the actual digit of the social security number had no effect on valuations nor on willingness to attend for free, after controlling for whether the digit was Odd or Even. It seems that the impact of the anchoring question passes through a binary categorical filter.

--- Table 2 ---

The results of Experiment 3 are consistent with the previous two experiments, and effectively rule out an inferential explanation for the “Tom Sawyer” effect. It is hard to imagine how the subject could infer anything about the quality of the poetry reading from a transparently random assignment. The experiment also rules out a demand effect explanation, because any conceivable demand effects would surely be present in exactly the same form across both experimental conditions.

Discussion. Looking around, we see people making a myriad of choices, ranging from the trivial to the profound. People decide whether or not to purchase Big Macs, to smoke, run red lights, take vacations in Patagonia, listen to Wagner, slave away at doctoral dissertations, marry, have children, live in the suburbs, vote Republican, and so on. These choices are all grist for the economists’ theoretical mill. The apparent orderliness in these choices, their stability for a given individual and the generally correct directional response to changing incentives,

encourages the belief that the choices are firmly rooted in personal likes and dislikes – in fundamental values.

We suggest, in contrast, that correct directional responses to changing incentives do not provide strong support for fundamental valuation, but can follow from the fact that people try to behave in a sensible manner when it is obvious how to do so. Students may have no idea if listening to their professor recite poetry (or in general) is a good or bad experience, but they do know that if it's bad, longer is worse than shorter, and if it's good, then longer is better than shorter. Likewise, stability can result from the mere desire to behave sensibly. If earlier choices are recalled, the next time a similar choice situation arises the same decision policies will be invoked. Economists observe responsiveness to incentives and conclude that individuals are making choices based on fundamental valuation, much as they would if they observed our experiment, without awareness of the initial manipulation.

The level of coherence and arbitrariness in any set of choices is likely to depend on many factors. Arbitrariness is enhanced by ambiguity in a good or experience. We deliberately selected a somewhat ambiguous experience in the three experiments presented here; clearly, some experiences are unambiguously good or bad. At the same time, many of the most important decisions that people make – about marriage, education, emigration, jobs and vacations – involve streams of heterogeneous episodes that are arguably even more difficult to assess, and hence are even more vulnerable to arbitrary influences and conventions than our simple poetry-reading proposition (Ariely & Carmon, 2002). Is a vacation that includes peaceful hours of reading on the beach, delicious meals, but also screaming children, money worries, and stressful transportation a good thing or a bad thing on balance? This is an awfully difficult question to answer.

Coherence will depend on how easy it is to spot behavioural inconsistencies (Ariely et al., 2003), which depends in turn on whether numerical scales or indices are available, on how close in time choices are made, and on whether connections among them are obvious. In general, we should expect to see coherence only when an individual who has made an initial choice, and is now faced with a second choice, remembers the first, and is aware of how he or she must resolve the second choice so as to be consistent with the first. These requirements are regularly satisfied in a narrow range of decisions, of which financial decisions are perhaps the best example.

But even in highly rationalized financial markets, which facilitate coherent decisions, the absence of fundamental valuation can profoundly influence aggregate behaviour, because the market participants — like the subjects in our experiments — misunderstand the causes of their actions, and hence, also, the causes of the price levels. In financial markets, for example, a stock's value is supposed to reflect individual investors' estimates about that company's expected stream of future dividends, appropriately discounted. When we look at short-term fluctuations in prices, we do indeed see stock prices responding appropriately to good or bad news about individual companies, or the economy as a whole. In the long term, however, markets exhibit wide fluctuations that are completely out of line with historical fluctuations in dividend streams, as the economist Robert Shiller and others have argued persuasively (Shiller, 1998; Summers, 1986). Day-by-day, investors can see the coherence in short-term market responses, but nothing so clearly signals whether the market is over- or underpriced as a whole. When the 'bubble' bursts, everyone wakes up, as it were, and stocks move to very different price level, which, again, may contain a large arbitrary component.

Why does it matter whether economic decisions are determined by fundamental values? First, coherent arbitrariness violates the basic economic assumptions about how the 'general

equilibrium' of an economy comes into existence. Modern economics assumes that exogenous consumer preferences interact with 'technologies' and initial endowments to produce equilibrium states of the economy — the prices and production levels. This analysis falls apart if preferences are themselves influenced by the very equilibrium states that they are presumed to create.

Indeed, in the domain of economic decision-making, the most salient and potentially powerful anchors may well be the public parameters of the economy itself — the relative prices and relative scarcities of different commodities. By posting a price for a new product, for instance, a firm invites consumers to consider whether they would purchase at that price and so replicates the anchoring manipulation as conducted in our experiments. If prices and other economic parameters function like public anchors, then consumer tastes no longer exist independently of prices but are endogenous to the economy. In that case, the equilibrium price and production levels of the economy are no longer uniquely determined by its physical and human resources and characteristics. Rather, a certain price level may prevail because of collective anchoring, triggered by historical accident or manipulation.

Second, economics as practiced today is not only a descriptive but also a prescriptive social science. Economists derive the 'welfare implications' of alternative policies about, e.g., taxation or trade, where welfare is defined in terms of the degree to which a policy leads to the satisfaction of individual preferences. Economists have, of course, identified many situations where free market exchanges may not increase welfare. Such theoretical market failures usually arise from interactions between people with asymmetric information or in situations where people do not internalise the costs they impose on each other. The suboptimalities that arise from coherent arbitrariness, in contrast, begin at the level of the individual. If preferences have a large

arbitrary component, then even strictly personal consumption choices by fully informed individuals need not maximize welfare.

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Table 1: Desire to listen to a free poetry reading in Experiment 1. The top panel summarises the results for the participants who were first asked whether they will accept \$2 to listen to Ariely recite poetry. The bottom panel summarises the results for the participants who were first asked whether they will pay \$2 to listen to Ariely recite poetry.

<u>Accept Group</u>	
Would you attend Ariely recital for \$2?	59% say Yes
Would you attend Ariely recital for Free?	8% say Yes (would attend for free)
<u>Pay Group</u>	
Would you pay \$2 to attend Ariely recital?	3% say Yes
Would you attend Ariely recital for Free?	35% say Yes (would attend for free)

Table 2: Results of Experiment 3. The top panel summarises the results for participants who were first asked whether they would attend the poetry recital in return for the dollar equivalent of the last digit of their Social Security Number. The bottom panel summarises the results for participants who were first asked whether they would pay the dollar equivalent of the last digit of their Social Security Number in order to attend the poetry recital.

<u>Odd Social Security Number Digit (Willingness to Accept Group) (N=46)</u>	
% Willing to attend for \$ = <u>Soc.Sec.No.</u>	63%
Mean valuation (st. error)	— \$4.46 (.51)
Would attend for free	9%
<u>Even Social Security Number Digit (Willingness to Pay Group) (N=35)</u>	
% Willing to pay \$ = <u>Soc.Sec.No.</u> to attend	20%
Mean valuation (st. error)	— \$1.13 (.59)
Would attend for free	49%

Figure 1: Willingness to pay / accept money in US\$ for different durations of poetry (right) and experiment participation (left) as a function of whether the hypothetical question was for paying (squares) or accepting payment (circles).

