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FOR
POLICY
REFORM

Procrastination and Obedience

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Draft: June 1991

Usual models of economic behavior used in analysis of policy reform assume individualistic values with forward looking rational expectations. These assumptions, while excellent at clarifying economic principles, are not quite realistic in an environment where significant policy reform is taking place. This environment may be characterized more by individuals changing their minds and behavior as they respond to leadership and new ideas. This research models repeated decisions with time inconsistent behavior. Although each decision results in only small losses, the cumulative effect of a series of repeated errors can be quite large. Policy consequences of this type of behavior are illustrated with examples from savings, crime, substance abuse, politics and bureaucratic organizations. Courses of action are reinforced by selective elimination of information contrary to that course of action, so that initial psychological overcommitments are reinforced. Limiting initial overcommitment and providing constant, contradictory information are important instruments to avoid the losses which result from procrastination and indoctrination.

In this lecture I shall focus on situations involving repeated decisions with time inconsistent behavior. Although each choice may be close to maximizing and therefore result in only small losses, the cumulative effect of a series of repeated errors may be quite large. Thus, in my examples, decision makers are quite close to the intelligent, well-informed individuals usually assumed in economic analysis, but cumulatively they make seriously wrong decisions which do not occur in standard textbook economics.

This lecture discusses and illustrates several "pathological" modes of individual and group behavior: procrastination in decision making, undue obedience to authority, membership of seemingly normal individuals in deviant cult groups, and escalation of commitment to courses of action which are clearly unwise. In each case individuals choose a series of current actions without fully appreciating how those actions will affect future perceptions and behavior. The standard assumption of rational, forward-looking, utility maximizing is violated. The non-independence of errors in decision making in the series of decisions can be explained with the concept from cognitive psychology of undue salience or vividness. For example, present benefits and costs may have undue salience relative to future costs and benefits.

Procrastination occurs when present costs are unduly salient in comparison with future costs, leading individuals to postpone tasks till tomorrow without foreseeing that when tomorrow comes, the required action will be delayed yet again. Irrational obedience to authority or escalation of commitment occurs when the salience of an action today depends upon its deviation from previous actions. When individuals have some disutility for disobedience and a leader chooses the step sizes appropriately, individuals can be induced to escalate their actions to extraordinary levels; the social psychologist Stanley Milgram led

subjects to administer high levels of electrical shock to others in fictitious learning experiments. The subjects were induced into actions which were contrary to their true moral values. In the latter half of the lecture I will give examples to illustrate how sequences of errors, each error small at the time of the decision, cumulate into serious mistakes; these decisions also illustrate how laboratory conditions of isolation, carefully engineered in the Milgram experiment and necessary for the type of behavior he induced, in fact commonly occur in nonexperimental situations. Thus the sequences of errors which are the subject of this lecture are not rare and unusual, only obtainable in the laboratory of the social psychologist, but instead are common causes of social and economic pathology.

Although an analysis of behavioral pathology might initially appear to be outside the appropriate scope of economics, I shall argue that in important instances such pathology affects the performance of individuals and institutions in the economic and social domain. Examples include the poverty of the elderly due to inadequate savings for retirement, addiction to alcohol and drugs, criminal and gang activity, and the impact of corporate "culture" on firm performance. Economic theories of crime, savings, and organizations are deficient and yield misleading conclusions when such behavior is ignored. The behavioral pathologies that I will describe also have consequences for policies toward, for example, savings, substance abuse, and management.

Individuals whose behavior reveals the various pathologies I shall model are not maximizing their "true" utility. The principle of revealed preference cannot therefore be used to assert that the options that are chosen must be preferred to the options that are not chosen. Individuals may be made better off if their options are limited and their choices constrained. Forced pension plans may be superior to voluntary savings schemes; outright prohibitions on alcohol or drugs may be preferable to taxes on their use reflecting their nuisance costs to

others; and an important function of management may be to set schedules and deadlines and not simply to establish "appropriate" price theoretic incentive schemes to motivate employees.

I. Saliency and Decisions

A central principle of modern cognitive psychology is that individuals attach too much weight to salient or vivid events and too little weight to nonsalient events. Nisbett and Ross (1980), describe the following thought experiment, which they consider the "touchstone" of cognitive psychology, just as the shifting of a supply or a demand curve is the central thought experiment of economics.

Let us suppose that you wish to buy a new car and have decided that on grounds of economy and longevity you want to purchase one of those stalwart, middle-class Swedish cars -- either a Volvo or a Saab. As a prudent and sensible buyer, you go to Consumer Reports, which informs you that the consensus of their experts is that the Volvo is mechanically superior, and the consensus of the readership is that the Volvo has the better repair record. Armed with this information, you decide to go and strike a bargain with the Volvo dealer before the week is out. In the interim, however, you go to a cocktail party where you announce your intention to an acquaintance. He reacts with disbelief and alarm: "A Volvo! You've got to be kidding. My brother-in-law had a Volvo. First, that fancy fuel injection computer thing went out. 250 bucks. Next he started having trouble with the rear end. Had to replace it. Then the transmission and the clutch. Finally sold it in three years for junk." (quoted in Nisbett and Ross, 1980, p. 15; from Nisbett, Borgida, Crandall, and Reed, 1976, p. 129).

The status of this additional information is only to increase the Consumer Reports sample by one. Mean repair records are likely to remain almost unchanged. Yet Nisbett and Ross argue that most prospective car-buyers would not view the new information so complacently.

An experiment by Borgida and Nisbett (1977) confirms the intuition that salient information exerts undue influence on decisions. Freshmen at the University of Michigan with a declared psychology major were chosen as subjects. Students were asked to express

preferences concerning psychology electives. Before making this decision a control group was given only mean psychology course evaluations; others were, in addition, exposed to a panel discussion by advanced psychology majors selected so that their course evaluations corresponded to the mean. As in the Volvo thought experiment, vivid information played a greater role than pallid information; compared to the control group, those exposed to the panel chose a higher fraction of courses rated above average. To counter the argument that this bias might be due to thoughtlessness because of the unimportance of the decision, Borgida and Nisbett note that the bias was greater for those who later entered the major than for those who dropped out.

II. Procrastination

Procrastination provides the simplest example of a situation in which there are repeated errors of judgment due to unwarranted salience of some costs and benefits relative to others. In this case each error of judgment causes a small loss, but these errors cumulatively result in large losses over time and ultimately cause considerable regret on the part of the decision maker.

Let me illustrate with a personal story and then show how such behavior can be modelled. Some years back, when I was living in India for a year, a good friend of mine, Joseph Stiglitz, visited me; because of unexpected limitations on carry-on luggage at the time of his departure, he left with me a box of clothes to be sent to him in the United States. Both because of the slowness of transactions in India and my own ineptitude in such matters, I estimated that sending this parcel would take a full day's work. Each morning for over eight months I woke up and decided that the next morning would be the day to send the Stiglitz box. This occurred until a few months before my departure when I decided to include it in

the large shipment of another friend who was returning to the U.S. at the same time as myself.

The preceding story can be represented mathematically in the following way. The box was left with me on day 0. At the end of the year, at date T , the box could be costlessly transported. The cost of sending the box on any day prior to T was estimated at c , the value of a day's work. I estimated Joe's valuation of the use of the contents of the box (which was the same as my value of his use of the contents) at a rate of x dollars per day. I saw no reason to attach any discount rate to his use of the box. However, each day when I awoke, the activities I would perform if I did not mail off the Stiglitz box seemed important and pressing, whereas those I would undertake several days hence remained vague and seemed less vivid. I thus overvalued the cost of sending the box on the current day relative to any future day by a factor of δ . This caused me to procrastinate.

On each day t , until date $T - c/x$, I made the dynamically inconsistent decision that I would not send the box on that day, but would instead send it the very next day. Ultimately, I decided to simply wait and send it costlessly at my departure.

Consider my decision process. On each day t , I awoke and made a plan to send the box on date t^* . I chose t^* to minimize V , the costs net of the benefits of sending the box.

If I sent the box on that day--day t -- V would be

$$(1) \quad V = c(1 + \delta) - (T - t^*)x \quad \text{for } t^* = t.$$

The factor δ represents the extra salience of sending the box on that day. If I waited, but sent the box at some later time, other than the time of my departure, V would be

$$(2) \quad V = c - (T - t^*)x \quad \text{for } t+1 \leq t^* < T$$

And if I waited until the end of my stay to send the box I saw that

$$(3) \quad V = 0 \quad \text{for } t^* = T.$$

On each and every day, up until day $T - c/x$, the time when the costs of sending the box just equaled the benefits of its receipt, I decided to send the box tomorrow. Since δc was sufficiently large, at each date t , I set the planned date for sending the box at $t^*=t+1$. By time $T - c/x$ it was apparent that the costs of sending the box no longer exceeded the benefits, and thus I guiltily decided to ship it at the time of my return. I had procrastinated too long.

Three key features of the situation resulted in procrastination. First, the time between decisions was short. Second, in each period there was a small, but not a minuscule, "salience cost" to undertaking the job now rather than later. The condition which results in procrastination is $\delta c > x$. The daily benefit from the box, x , is small if the time between decisions is short. δc is significant if there is a significant psychological lump sum cost to doing the project now rather than later. The third key feature of the situation was the dynamic inconsistency in my decision making. Each day I decided to put off the project until tomorrow. I did not have rational expectations, since I did not foresee that when the next day came I would continue to put off the decision for an additional day.

My procrastination was costly. The cumulative loss incurred due to my procrastinating behavior amounted to approximately $Tx - c$.¹ For each day up to the critical day at approximately $T - c/x$, I wrongly decided not to send the box. After the critical time (approximately) $T - c/x$, I made the correct decision to wait to send the box.² For every day between 0 and $(T - c/x)$ the loss from the decision made on that day was x , the cost of an extra day's use of the box. The cumulative loss was consequently the product of the daily cost of a delay, x , and the $(T - c/x)$ decisions to delay. This product is $Tx - c$, the total loss from the failure to send the box. In consequence, the cumulative cost of the errors of decision amount to the total loss which occurs over the period. Many wrong decisions all of the same type but of small value cumulated into a significant loss. And yet this loss occurred

as a consequence of only a modest amount of irrationality or "undue salience."

A numerical example is useful to illustrate the necessary size of the "salience" premium δ on current relative to future work required for procrastination to occur. Suppose that I valued my time at \$50 per day and Joe Stiglitz' use of his box at 50 cents per day. If δ exceeds .01 (= .50/50), then procrastination will occur for 265 (=365 - 50/.5) days. We consequently see that in this type of example, where there are significant initial costs relative to the benefits, only small amounts of unwarranted salience on present relative to future action can result in significant delay.

Procrastination with Deadlines. The preceding model of procrastination has the special feature that if the task is not done in a timely fashion it does not need to be done at all. It is like the referee's report which the editor angrily sends to another reviewer after too long a lapse. However, many tasks have deadlines. For our students, the cost of procrastination involves "pulling an all-nighter" to get the term paper (conference paper) done on time.

Qualitatively the same type of results that we have already seen can still occur: small salience costs to beginning projects can result in costly procrastination. Consider what happens if the disutility of a project varies with the square of hours worked per day, and the number of hours to complete a project is fixed. Let the salience cost of beginning a project be a multiple of the disutility of the first day's work. In an example in which the salience cost is 2 per cent of the total cost and the length of the project is 100 days, the added cost of completing the project can be calculated at approximately 41%.³

It may also be worth noting that if the salience value of beginning the project increases with the intensity of the first period's work, a project, such as a reducing diet, may never be begun, or a task may be begun at the latest possible date at which completion is feasible.

III. Procrastination: Substance Abuse, Savings, and Organizational Failures

At first glance, my examples of procrastination may appear to be of no relevance to economics. However, I want to argue that such behavior may be critical in understanding the causes of such varied problems as drug abuse, inadequate savings and some types of organizational failure.

A. Substance Abuse. It has often been observed that consumers are knowledgeable about their decisions, and that their decisions are utility maximizing. Ethnographies of drug users suggest that drug use is no exception. Becker and Murphy (1988) and Stigler and Becker (1977) have developed the theory of such behavior in their forward-looking models of rational addiction. In these models, use of a good affects the future enjoyment of its consumption, but people correctly foresee these changes in taste. The application of such models, combined with utilitarian ethics, leads to the conclusion that drug use should be legalized with a tax reflecting its nuisance to others.

I do not agree with this conclusion, because I do not agree that the model of forward-looking, rational behavior accurately describes the way in which individuals decide on drug or alcohol intake. Most drug abusers, like most chronically overweight individuals, fully intend to cut down their intake, since they recognize that the long-run cost of their addiction exceeds its benefits. They intend to stop--tomorrow. Individuals following the procrastination model are both maximizing and knowledgeable, and yet their decisions are not fully rational.

For example, psychologist Roger Brown (1986, p. 636) describes addictions in the following way. "Actions like smoking a cigarette, having a drink, eating a candy bar, and working overtime to 'catch up' all lead to immediate and certain gratification, whereas their bad consequences are remote in time, only probabilistic, and still avoidable now. It is no contest: Certain and immediate rewards win out over probabilistic and remote costs, even

though the rewards are slight and the possible costs lethal."

Ethnographies of drug abusers reveal that most are well aware of the long-term consequences of their habit and many have detailed and subtle knowledge of the effects of drugs. (See, for example Carpenter et al., 1988 and Feldman et al., 1979.) They apply this knowledge to avoid some of the worst potential consequences of drug use. An interview with Don, an "angel dust" (PCP) user in the Seattle-Tacoma area reveals the knowledge of the long-term effects of drug use, and also an inability to use that knowledge to quit. Don tells his interviewer (Feldman, et al. 1979, p. 137):

"And every time I use the drug and I come down and I am straight, since I do have this heightened form of awareness and perspective, I always tell myself, 'Well, that's the last time I'll use it. I don't need it now.' I can see where this is, what I've got to do, and this is what I want to do and everything falls into place."

Later, I will discuss some ways in which the social pressures emanating from group dynamics reinforce individual reasons for addiction.

B. Savings. The procrastination model may also pertain to intertemporal savings and consumption decisions. The modern textbook/journal article model of consumption and savings decisions typically views agents as maximizing a time-separable utility function with discount rate δ . This discount is said to parameterize agents' impatience. Curiously, economists who build models with utility functions of this sort consider themselves to be modeling the behavior of rational consumers. Yet early discussion of impatience viewed discounting as irrational behavior. Irving Fisher regarded such impatience as evidence of lack of foresight or lack of will. In this regard he writes,

"Generally speaking, the greater the foresight, the less the impatience and vice versa.... This is illustrated by the story of the farmer who would never mind his leaking roof. When it rained he could not stop the leak, and when it did not rain there was no leak to be stopped! Among such persons, the preference for present

gratification is powerful because their anticipation of the future is weak." (italics in original)

(Fisher, 1930, p. 81)

Irving Fisher's example of the farmer fits the model of an agent continually making an inconsistent decision.

A clear moral of the procrastination model is that time inconsistent behavior is especially apt to occur when there is some fixed cost (perhaps not very great) to beginning a task, the "periods" are short, and the per period cost of delay is low. Many personal financial decisions satisfy these conditions. A good example concerns the behavior of junior faculty at Harvard. Due to some institutional oddity, University contributions to TIAA/CREF cumulated without payment of interest until the recipient filed a form indicating his desired allocation between the two retirement funds. This could be done at any time and took less than an hour. And yet most junior faculty who left Harvard in the 1970's made this decision only upon their departure. They thus lost hundreds of dollars worth of interest by failing to do an hour's work.⁴

A more serious application of the procrastination model is to savings.⁵ Most of the U.S. elderly (those over 65) derive relatively little of their income from financial assets. In 1971 51 percent of the elderly had no income from financial assets; 78 percent had less than 20 percent of their income from financial assets. (Hurd, 1990, p. 571). This stark absence of financial asset income is consistent with the hypothesis that most households would save very little, except for the purchase of their home and the associated amortization of mortgage principal, in the absence of private pension plans. Partly because these additions to financial assets are so small, some seemingly paradoxical results have been obtained. Cagan (1965) and Katona (1965), for example, find a positive relation between pension plans and private saving. In the life cycle model (up to some limit) \$1 of pension savings should lead to \$1

reduction of private saving. Venti and Wise (1986, 1987) report results similar to those of Cagan and Katona. They find no significant relation between ownership of a pension plan and willingness to invest in IRAs. Munnell's (1976) findings are less extreme. She looked at the savings of a sample of 5,000 men aged 45 to 59 in 1966. She estimated that a dollar of private pension contribution, caused a reduction in nonpension savings of 62¢ for these men nearing retirement. This is considerably less than the \$1 which would be expected if people were life cycle savers and pension plans did not induce oversaving.⁶

The hypothesis that, in the absence of pension plans, many individuals lack sufficient self discipline to begin saving for retirement in a timely fashion is consistent with the finding that there were high rates of elderly poverty prior to the rapid, unexpected growth in Social Security payments in the late 1960's and the 1970's. In 1966 the elderly poverty rate was 30 percent, fully double the poverty rate of the nonelderly (Ellwood and Summers, 1986, p. 81).⁷

C. Organizational Failures

Procrastination is as prevalent in the workplace as in the home. Procrastination by workers results both in delay in initiating projects which should be begun as well as in delay in terminating projects which should be ended.⁸

In private life, individuals are frequently forced to self-monitor their behavior, as in stopping an addiction, writing a Ph. D. thesis, devising a private asset plan, or sending off referee reports; in such areas procrastination can easily occur leading to serious losses. However in work situations, outside monitoring is possible, and a major function of management is to set schedules and monitor accomplishment so as to prevent procrastination.

Proper management not only prevents procrastination in project *initiation*; it also prevents procrastination in project *termination*. Psychologists have found tendencies to delay terminations of projects by people who consider themselves responsible for their initiation.

Staw (1976) divided a group of 240 undergraduate business students into two groups. One group was asked to decide on investment allocation in a business school case study of the Adams and Smith Corporation. They were then asked to make a further allocation of investment between the division with their initial project and the other division of the firm. In contrast, a control group only had to make the second allocation. Both groups, however, had matched past histories of the firm and the success of the firm's projects. In the case of project failure, those who had made a prior commitment wanted to invest significantly more in that division than the control group with the same matched history who had made no such prior commitment. One explanation matches our model: that failure to terminate the project puts the painful decision off until tomorrow; the pain of admitting a mistake today is salient relative to the pain of having to admit a possibly even bigger mistake tomorrow. This same phenomenon may also be explained, not necessarily inconsistently, by cognitive dissonance. Once people have made decisions, they avoid information which does not support that decision because it is psychologically painful.

Staw and McClane (1984) report how the commercial division of a large American bank avoids procrastination in loan cutoff decisions. Loan officers are not penalized for cutting off loans, although they are penalized for failing to foresee possible losses. They are especially penalized if loan losses are discovered by bank examiners before they are reported. Most important, loans with significant difficulties are referred to a separate committee not involved in the initial decision to obtain the maximum salvage value.

In the next section I will discuss how courses of action are reinforced by selective elimination of information contrary to that course of action, so that initial psychological overcommitments are reinforced. Ross and Staw (1986) examine the history of Expo 86 in Vancouver, whose projected losses escalated from a maximum of \$6 million to over \$300

million. In this case, exit costs reinforced the initial psychological overcommitment: the Prime Minister of British Columbia feared loss of election on termination, contracts would have to be breached, and outside vendors would make losses from investments made in anticipation of the fair.

Staw (1987) lists management practices which limit overcommitment: administrative turnover, low cost to executives for admitting failure, lack of ambiguity in data regarding performance, allowing losses to be blamed on exonerating circumstances, separating termination decisions from initiation decisions, and considering from the beginning the costs and procedures of project termination.

IV. Indoctrination and Obedience

Irrational obedience to authority is a second type of "pathological," time inconsistent behavior with important social and economic ramifications. Procrastination occurs when there is a fixed cost of action today and current costs are more salient than future costs. Undue obedience to authority may occur as a form of procrastination if disobedience of an authority is salient and distasteful. In addition, authority may be particularly powerful when yesterday's actions affect the norms of today's behavior. Both such influences--the salience of current disobedience and a shift in the utility of subjects in accordance with their prior actions--are present in Milgram's experiments, which I shall review.

The subjects in the Milgram experiment were adult males, recruited by a mail circular requesting participation in an experiment purportedly concerning the effects of punishment on memory. The subjects were assigned the role of teacher, while an accomplice of the experimenter, a professional actor, played the role of learner. The subjects were instructed to administer shocks to the learner when he gave wrong answers. The shocks were a learner-

discipline device. The learner, a trained actor instructed to simulate the appropriate reactions to the shocks administered by the subjects, was visible to the subject through a glass window, and, unbeknownst to the subject, was not wired. Subjects initially gave low voltage shocks (15 volts) with doses increasing 15 volts at a time to a maximum of 450. There are different versions of this experiment, but in all versions the learner showed significant response to the shocks. For example, in one version, according to Milgram's description "at 75 volts the learner began to grunt and groan. At 150 volts he demands to be let out of the experiment. At 180 volts he cries out that he can no longer stand the pain. At 300 volts he ... [insists] he must be freed." (Milgram 1965, p. 246, quoted in Stotland and Canon, 1972, p. 6). Despite these protests by the learner, 62.5 percent of the subjects reached the maximum of 450 volts. The experiment has been repeated under a wide variety of conditions, but always with the same result: a significant fraction of the population administers the maximum dosage.

As important as the primary finding from Milgram's experiment that individuals are remarkably obedient is the further finding of their lack of awareness of this trait in themselves and in others. Elliot Aronson (1980, p. 40), a professor of social psychology at UC Santa Cruz, asks the students in his classes how many would continue to administer shocks after the learner pounds on the wall. Virtually no one responds affirmatively. Milgram conducted a survey of psychiatrists at a major medical school who predicted that most subjects would not administer shocks in excess of 150 volts, and virtually no subjects would administer the maximum 450 volts. This finding supports my central argument: that in appropriate circumstances, people behave in time inconsistent ways which they themselves cannot foresee, as when they procrastinate or exhibit irrational obedience to authority.

A Model of Behavior in the Milgram Experiment. Let me present a simple model which is a variant of the previous model of procrastination and which explains the sequential

decisions made by the subjects in Milgram's experiment. I shall first assume that current disobedience by the subject is especially painful; it is especially salient. Lee Ross (1988) has argued that special salience is attached to disobedience because there is an implicit contract between the teacher and the experimenter. The experiment defines the situation so that there is no legitimate way for the teacher to terminate.⁹ Thus the subject may obey the current instruction, but plan to disobey in the future. Second, I shall assume that the subject suffers a loss in utility, not based on the current voltage he administers to the learner, but instead on the deviation of the current voltage from what he last administered. (Alternatively his utility might depend on the deviation from the highest voltage previously administered). This model is consistent with cognitive dissonance. Once people have undertaken an action, especially for reasons they do not fully understand, they find reasons why that action was in fact justified. In this formulation the subject decides to obey up until time T so as to maximize V_t .

If he disobeys today at time t , his utility is

$$(4) \quad V_t = -bD(1 + \delta)$$

But if he postpones obeying, his expected utility is

$$(5) \quad V_t = -bD - c \sum_{k=t}^{T-1} (W_k - W_{t+1}) \quad T \geq t+1$$

if he first disobeys at time $T \geq t+1$, where

δ is the extra salience attached to today's disobedience,

D is the cost of disobedience,

W_k is the voltage of the shock administered at time k , and

W_{t+1} is the norm for the level of shocks determined by previous actions.

It can easily be seen in this formulation that at each date, with sufficiently slow expected

future escalation of commands the subjects can be led, as in the Milgram experiment, to deliver ever higher levels of shock. They plan to disobey in the future if the experiment continues, but not currently. While planning future disobedience, if escalation continues, at the same time these subjects are continuing to raise the level of shock required to induce them to disobey. The dependence of norms of behavior on previous actions does not just cause continued poor decision-making due to postponement, but also to escalating errors in decisions.

While V may be the function that subjects maximize in the heat of the moment, under the conditions of the Milgram experiment, a more accurate expression of their true intertemporal utility function might be

$$(6) \quad V_o = \sum_k \{-bD_k - cW_k\}.$$

where V_o is their intertemporal utility and k sums over all the trials.

Such a utility function is reflected in the post-experiment interviews and follow-up questionnaires. Most of the subjects were, in retrospect, extremely regretful of their decisions in the experiment. For example one subject, who was a social worker, wrote in a follow-up questionnaire a year later

"What appalled me was that I could possess this capacity for obedience and compliance to a central idea, i.e. the value of a memory experiment, even after it became clear that continued adherence to this value was at the expense of the violation of another value, i.e. don't hurt someone else who is helpless and not hurting you. As my wife said, 'You can call yourself Eichmann'."

(Milgram, 1975, p. 54)

The preceding models of procrastination and obedience concern actions which occur because individuals possess cognitive structures of which they are less than fully aware. The assumption that such structures influence behavior is unfamiliar in economics, but central to other social sciences. A major task of psychology is to discover such unperceived behavioral

regularities; the concepts of culture in anthropology and the definition of the situation in sociology both concern cognitive structures only dimly perceived by decision makers.

The Milgram experiment demonstrates that isolated individuals can exhibit remarkably obedient (and deviant) behavior inside the laboratory. In group situations, however, there is evidence that such behavior occurs only when there is near unanimity of opinion. In this regard, the most relevant evidence comes from a variant of the Asch experiment. Asch (1951, p. 479) found that subjects asked to match the length of a line to a comparison group of lines of different length gave the wrong answer roughly 40% of the time if they were preceded by confederates of the experimenter who had previously given the wrong answer. However, in another variant of the experiment, Asch (1952) found that the presence of just a single confederate who gave the right answer in a large group of confederates reduced the number of wrong answers by a factor of two thirds. This suggests that the presence of like minded others significantly raises the likelihood of disobedience in situations such as the Milgram experiment. It might be inferred that obedience such as obtained by Milgram could only occur in the laboratory where people are shielded from outside information and influences.

The next four sections will present examples of individuals who participate in groups and make regrettable decisions. In each of the examples a sequence of small errors has serious ill consequences. Furthermore, in each of the situations described there is a natural equilibrium in which those who disagree with the actions taken find it disadvantageous to voice their dissent, which is accordingly isolated from the decision-making process.

V. Cults

A. Unification Church. Evidence seems to show that neither members nor inductees into

cult groups such as the Unification Church (Moonies) are psychologically very much different from the rest of the population (see Galanter et al., 1979 and Galanter, 1980). The method of induction into the Moonies indicates how normal people, especially at troubled times in their lives, can be recruited into cults and the cult can persist. Membership into the Moonies involves four separate decisions. Potential recruits are first contacted individually and invited to come to a 2-day, weekend workshop. These workshops are then followed by a 7-day workshop, a 12-day workshop and membership. The potential recruit in consequence makes four separate decisions: initially to attend the 2-day workshop, to continue into the 7-day workshop, and then again into the 12-day workshop, and finally to join the Church. As in the Milgram experiment, the membership decision is achieved in slow stages.

Consider the process from the point of view of the potential recruit. Those who agree to attend the first 2-day workshop must have some predisposition toward the goals of the Church; otherwise they would not have attended. But they are probably surprised on arrival to find so many like-minded persons. In addition, the members of the Church intermingle and apply gentle persuasion in the first 2-day workshop; the inductees' commitment at this point begins to change. Then, continuing with the 7-day workshop, and again with the 12-day workshop, only the most committed continue; those who disagree leave. At each stage the Church members are thus able to increase the intensity of their message. As in the Milgram experiment and other social psychology experiments on conformist behavior, the potential inductee, in the absence of disagreement, is likely to change his opinions. And, as we have seen, because of the self-selection process there is unlikely to be strong disagreement among the workshop attendees. Marc Galanter's study of eight workshop sequences reveals this gradual attrition according to commitment. Of the 104 guests at the initial 2-day workshops, 74 did not continue. Of the 30 at the 7-day workshops 12 did not continue

(including a few who were rescued by their families, and a few who were told not to continue by the Church). Of the 18 remaining at the 21-day workshops 9 did not continue to membership. And of the remaining 9, 6 were active church members 6 months later.

The example of the Moonies illustrates a process of conversion. Converts make a sequence of small decisions to accept authority. Ultimately, as a result of this sequence of decisions to obey rather than to rebel, the converts develop beliefs and values very different from what they had at the beginning of the process. This willingness to acquiesce to authority is abetted by self-selection. Those who agree most with the Church self-select into the group. Because those who disagree most exit, the dissent necessary for resistance to escalation of commitment does not develop.

B. Synanon. The case of Synanon is possibly the best studied, as well as being, in the end, one of the most horrific of these cult groups. In this group we can see the pressure for obedience to authority operative in the Milgram experiment as well as the selective exit of would-be dissenters who could break the isolation necessary to maintain this obedience to authority.

Synanon was initially an organization devoted to the cure of drug addicts, but it gradually evolved into a para-military organization carrying out the increasingly maniacal whims of its founder and leader. (My account comes from Gerstel, 1982.) The leader, Charles Dederich, as well as the other founders of Synanon, adapted the methods of Alcoholics Anonymous for the treatment of drug addiction. At the time little was known about drug abuse in this country; it was also widely believed that drug addiction was incurable. By proving the contrary Synanon received considerable favorable publicity. With aggressive solicitation of gifts (especially of in-kind tax deductible gifts) and commercial endeavors such as the sale of pens, pencils and briefcases with the Synanon logo, it expanded from a houseful of ex-

addicts, first to a large residential site in Santa Monica, and, at its peak, to several residential communities in both Northern and Southern California with more than 1,600 residents (Ofshe, 1980, p. 112).

To understand the path of Synanon from these benign origins into what it eventually became, it is necessary to focus on the methods of control in the organization. The members led dual lives: daytime work-day lives, and nighttime lives spent in a pastime called The Game. The daytime lives of members were devoted to hard work, especially for the cause of the community. Members were given virtually no private property and were expected to donate their own resources to Synanon; they had virtually no privacy. David Gerstel (1982) reports his first impressions of Synanon as amazement at the cleanliness of the buildings, the orderliness of the grounds, and the cheerfulness of the workers. The daytime code of Synanon was to maintain a cheerful positive attitude at all times, exemplified by the song of the trashmen: "We're your Synanon garbage men./ We don't work for money. Ooooh, we don't work for cash./ We work for the pleasure/ Of taking out yo' trash" (Gerstel, p. 5).

At night, however, the unbridled positivism was given up, and members acted out their hostility and aggressions in The Game (adapted from the practices of Alcoholics Anonymous, from which Synanon originated). Participants in the game were expected to be brutally frank in criticizing any other member who did not live up to the standards expected of a Synanon member. Because the lives of the members were so open to each other, these criticisms could extend to the smallest detail. Since members had virtually no privacy, this criticism naturally monitored any deviation from the purposes of the organization. The incentives of The Game induced members to strive to maintain the very best behavior.

The Game, however, like any other game, had rules, and those rules led to complete control of this fairly large community by its leader. These rules encouraged the criticism of

members by one another, but forbade criticism of the goals of Synanon itself or any shortcomings of its leader. Anyone who criticized the organization or its leadership would be harshly criticized by all (an incentive not to engage in such activity). If that criticism persisted the offender would be banished from the community.

Under these rules of behavior Synanon evolved into an organization under the control of a leader who became increasingly insane. In the late 1970's Dederich insisted that members follow his every whim, which included, to give some examples, enforced dieting (the Fatathon), enforced vasectomies for all males, and an enforced change of partners, first of all for married members of the community, and subsequently for all paired members whether married or not. Those who did not go along with these measures were "gamed" i.e. criticized vehemently in The Game, beaten up, or evicted. During this period Dederich was also building up his own armed paramilitary force which reacted against threats both within and outside the Community. Within Synanon dissenters were beaten up. Outside passers-by or neighbors with real or presumed insults aimed at the Community were accosted and beaten, often severely. One former member, who was suing for the custody of his child still living there, was beaten to the point of paralysis, never to recover. Dederich was eventually convicted on a charge of conspiracy for murder -- for sending unwanted mail to a young Los Angeles attorney, Paul Morantz, who was fighting Synanon: two Synanon vigilantes left a poisonous rattlesnake in Morantz's mail box.

The Synanon experience follows closely what Milgram observed in the laboratory. At each move by Dederich the members were forced individually to decide whether to obey or to disobey. Disobedience involved the present cost of leaving the group and seeking immediately a new way of life with insufficient human and financial resources. Many members in the past had found life outside Synanon painful and had sought refuge there.

Thus the consequences of disobedience were immediate and salient. As members chose the course of obedience their norms of behavior as members of Synanon gradually changed, just as the norms of behavior of Milgram's subjects changed according to the level of punishment they had previously administered. The process was aided, in Synanon as in Milgram's laboratory by the absence of dissent. In Synanon the absence of dissent was ensured in usual circumstances by the Game and in unusual circumstances by forced expulsions.

VI. Crime and Drugs

Economists modeling crime (see Becker, 1968) and drug addiction have viewed the decisions to engage in these activities as individually motivated. Becker and Murphy (1988), following Stigler and Becker (1977), have even viewed the decision to pursue addictive activities as both rational and forward-looking. The Milgram experiment and the behavior of cult groups, if nothing else, serve as warning. It is inconceivable that the participants in Milgram's experiment were forward-looking. These participants could not imagine that anyone--least of all themselves--would behave as they ultimately did. Likewise, the flower children of Synanon of the 1960's could not have conceived of themselves turning into gun-toting toughs in the 1970's. The assumption of forward-looking rationality regarding the change in their consumption capital, to use Stigler-Becker terminology, is totally violated.

The analogy between cult groups and the behavior of teenage gangs, where most criminal activity and drug addiction begin, is fairly complete. A member of a teenage gang typically finds himself (much less frequently herself) in a position very similar to that of a member of Synanon. The typical member of a gang makes a sequence of decisions which results in an escalating obedience to the gang leadership. At each stage of his career as a gang member, he makes the choice whether to obey or to disobey. In extreme cases disobedience leads to

expulsion from the gang. The gang member thus faces the same dilemma as the member of Synanon; whether to forsake friends who are close and in an important respect define his way of life, or to go along with the gang decision. In rising from junior to senior membership in the gang, or in following a leader who himself is becoming deviant, the gang member by obeying increases his commitment to obedience. The situation is exactly analogous to that of subjects in the Milgram experiment.

Furthermore, the isolation from dissent obtained in Milgram's laboratory also naturally occurs in teenage gangs. The major activity of such gangs, according to David Matza (1966) is hanging out, and the major activity while hanging out is insulting other gang members to see how they respond. This activity is called "sounding" because it measures the depths of the other member, on his response to the insult. The depth probe usually focuses on the manliness of the gang member and/or his commitment to the gang itself. The probing of his commitment to the gang plays the same control function as The Game in Synanon. Those who display less than full commitment to the gang in sounding or to Synanon in the Game, suffer a form of public censure. Such procedures make members reluctant to voice their disagreements with the goals or activities of the gang, just as members of Synanon found it difficult to display negative attitudes toward the group. Thus members of teenage gangs find themselves in isolated positions, unable to resist the aims of powerful and deviant leaders. The ethnographies we have of such gangs support the importance of "sounding" and the role of important leaders who play a disproportionate role in planning gang activities (see MacLeod (1988) and Whyte (1943)).

Just as the participants in the Milgram experiment "drifted" into obedience, and members of Synanon "drifted" into gangsterism, David Matza (1964) showed how teenagers "drift" into delinquency. Matza (1969) likens the process of becoming delinquent to "religious

conversion." The analogies of drift and conversion are both consistent with our model of time inconsistent behavior. Like the cult groups I have just described, delinquent teenage gangs have mechanisms which work to preserve their isolation from outside influences. Should we be surprised that many such gangs with few social constraints engage in harmful deviant activity?

Consider the activities, as chronicled by Jay MacLeod (1988), of the "Hallway Hangers," a gang who live in a low income housing project in a New England city. The major activity of this gang is hanging out in Hallway #13 and sounding each other, with varying degrees of playfulness and malice. While hanging out the gang ingests a wide variety of stimulants, including beer in vast amounts, a great deal of marijuana, some cocaine, PCP and mescaline, and occasionally some heroin. The central value of this group is its loyalty to the gang and the other members, just as Synanon's central value from its inception to its end was the loyalty of members to the general community. The ethos of this gang is illustrated by the story of Shorty and Slick, when they were caught ripping off the local sneakers factory (as told by Shorty):

"See, that's how Slick was that day we were ripping off the sneakers. He figured that if he left me that would be rude, y'know. If he just let me get busted by myself and he knew I had a lot of shit on my head, that's what I call a brother. He could've. I could've pushed him right through that fence, and he coulda been gone. But no, he waited for me, and we both got arrested. I was stuck. My belly couldn't get through the fucking hole in the fence."

MacLeod, p. 32-33.

This same aspect of gang behavior was emphasized 50 years ago in the classic street corner ethnography by William Foote Whyte (1943). Whyte explained the lack of social mobility of the most capable corner boys by their unwillingness to adopt a life style which would have sacrificed friendships with peers who would not advance with them. Just as Slick did not run when Shorty got caught in the fence, in MacLeod's account, the leader of the "corner boys"

Doc, in Foote's account, fails to advance himself in school so he can remain with his friends.

Such gangs provide a perfect social environment for regrettable decisions. Gang members find the costs of nonacquiescence especially salient, since such nonacquiescence leads to isolation from the social group to which they are committed. As occurred at Synanon in a similar environment, gang members can then be led step-by-step to escalating levels of crime, drugs, and violence, with each preceding step setting the norm for the next.

The question remains how to alter such behavior by social policy. William Julius Wilson (1987) has argued the importance of the move from the central city to the suburbs of the middle class, which, he says, has resulted in the disappearance of social networks which formerly were the pathways to employment. According to Wilson the result, especially in the Black community, has been a dearth of employed, and therefore eligible males, and a dramatic increase in out-of-wedlock births.

There is, however, another effect of the disappearance of the urban middle class for poor youth left in the central cities. This disappearance has left fewer alternative social groups for those who do not want to acquiesce in the violent acts of their peers, thus making such acquiescence and gang violence more frequent.

Social policy should have the role of recreating, artificially if necessary, the beneficial social networks which have vanished. This would reduce the cost of dissent by gang members to criminal, violent, or drug-prone actions by providing alternatives. In addition, we have seen that just a little bit of dissent, and therefore perhaps just a little bit of information, may stop escalation toward commitment. Lisbeth Schorr (1989) has compiled a long list of social projects which have significantly reduced the problems of the underclass, problems such as teenage pregnancy, school truancy, drug abuse, violence and alcoholism. In each of these projects the key to success has been the special effort by social workers involved to

gain the trust of their clients. The success of these projects shows that when isolation can be broken and trust established small amounts of information can significantly reduce the number of regrettable decisions.¹⁰

One such experiment occurs in nature. Smaller cities have less room for specialization in social groups than larger cities -- so that isolation from common social norms is more difficult to attain. They also have lower crime rates. Cities with less than 10,000 people have one fifth the violent crime rates of cities with populations more than 250,000. Cities with over 250,000 people have higher violent crime rates than those cities with populations between 100,000 and 250,000 (U.S. Bureau of the Census, 1987, p. 157).¹¹

VII. Politics and Economics

Economists who have applied the tools of their trade to the political process have studied the workings of democracy and majority rule under individualistic values. (See Arrow, 1963.) They are optimists. The model of cult group behavior, in contrast, is relevant in understanding politics' darker side. I will give two illustrations.

A. Stalin's Takeover. My first example concerns Stalin's ascension to power in Russia. The history of the Bolshevik party and the history of Synanon are strikingly similar. (I take the Bolshevik history from Deutscher (1949)). Initially, there were the early days of reformist zeal, of meeting secretly in lofts, warehouses and other strange places. But, in addition, and most importantly, there was commitment to the organization. To the Bolsheviks, this commitment was of paramount importance. Indeed, it was over the constitutional issue as to whether party members should merely be contributors--either financial or political--or should, in addition, submit to party discipline that split the Russian socialist workers' movement into two parts--the Mensheviks and the Bolsheviks. This loyalty to party discipline, useful in the

Revolution, ultimately enabled Stalin to take over the party and pervert its ideals. It underlay the acquiescence of his tough comrade revolutionaries in the scrapping of the original principles of Bolshevism: open intraparty debate and dedication to the cause of the workers and peasants. In the 1920's and 1930's, as Stalin collectivized the peasants and tyrannized over dissidents, these old comrades stood by, perhaps not quite agreeing, but not actively disagreeing either, much like Milgram's passively obedient, passively resistant subjects. Even Trotsky in exile did not unambiguously oppose Stalin until the purges had begun as a series of decisions were made which increasingly brutalized the peasantry and cut off political debate. The exception to the lack of dissent proves the rule. Nadia Alliluyeva, was the daughter of one of the founding Bolsheviks and thus an heiress by birth to the ideals of the party. She was also Stalin's wife. When Stalin collectivized the peasantry moving perhaps 80 million from their farms in six months' time, she voiced her disapproval at a party; he replied savagely. That night she committed suicide.¹² This behavior contrasts with the party leadership who, like Milgram's subjects, had been participating in the decisions which were being taken. At each juncture they were confronted by the decision whether to break ranks with the increasing brutalization of the peasants or the choking off of dissent, or to remain loyal to the Party. By acquiescing step-by-step to the crescendo of Stalin's actions they were committing themselves to altered standards of behavior. In contrast, Nadia Alliluyeva, who had withdrawn from the decision-making process to be wife and mother, could feel proper revulsion at the deviation of the Party's actions from its prior ideals.

B. Vietnam War. A second example of the type of deviant group process I have described occurred in Johnson's Tuesday lunch group, which was the executive body controlling U.S. military decisions in the Viet Nam War (Janis, 1972). Here we see all of the features characterizing our model of salience, authority and obedience. First, there was the

gradual escalation of violence against the Vietnamese. Bill Moyers, reflecting on Viet Nam policy after he was out of office, precisely describes how this escalation of commitment happened: "With but rare exceptions we always seemed to be calculating the short-term consequences of each alternative at every step of the [policy-making] process, but not the long-range consequences. And with each succeeding short-range consequence we became more deeply a prisoner of the process." (Janis, p. 103) The subjects in Milgram's experiments could have said exactly the same thing.

The control of dissension within Johnson's Tuesday lunch group bore close resemblance to the processes at work in Synanon and the Hallway Hangers. Johnson would greet Moyers as "Mr. Stop-the-Bombing;" similar epithets were applied to other dissenters within the group: "our favorite dove," "the inhouse devil's advocate on Vietnam." (Janis, p. 120) A teenage gang would probably consider these soundings mediocre, but their lack of style may not have affected their impact. And the measures within the group which were taken to enforce unanimity ("groupthink" according to Janis) were supplemented by more or less voluntary exit as dissenters at different times came to disagree with the policy: Bill Moyers, George Ball, McGeorge Bundy and Robert McNamara. Interestingly, since each of these individuals exited fairly soon after they developed deep reservations about the policy, there was active dissent for only a small fraction of the history of the group.

VIII. Bureaucracies

My examples of obedience to authority, so far, have centered primarily on noneconomic phenomena: religion, crime, drugs, and politics. However, the phenomenon of obedience to authority is also prevalent in bureaucracies, which in a modern industrialized society are the sites of most economic activity.

One function of bureaucracies, following Weber and Merton (1968, p. 250), is to create specialists. A second function of bureaucracies is "infusing group participants with appropriate attitudes and sentiments." (Merton, 1968, p. 253) We could interpret the Milgram experiment as a toy bureaucracy, and our model of that experiment, as a model of that bureaucracy. In that case, $W_{i,1}$, the level of voltage which a subject has grown accustomed to giving, constitutes his "attitudes and sentiments." In Merton's terms, it defines his bureaucratic personality.

The specialization mentioned earlier can result in bureaucratic personalities that are "dysfunctional," to use Merton's terminology. We have already seen such dysfunction in the behavior of the Moonies, Synanon, teenage gangs, drug and alcohol abusers, the Bolshevik party and Johnson's Tuesday lunch group. The changes which occurred in individual decision-making behavior were "latent" to use another of Merton's terms, since they were not understood by the participants, and were unintentional. Furthermore, these changes occur exactly as I have been picturing: in making a sequence of small decisions, the decision maker's criteria for decisions gradually change, with preceding decisions being the precedent for further decisions. Merton gives an extreme example arising from bureaucratic personalities engendered in this way, in the United States Bureau of Naturalization concerning the treatment of the request for citizenship of Admiral Byrd's pilot over the South pole.

According to a ruling of the Department of Labor Bernt Balchen...cannot receive his citizenship papers. Balchen, a native of Norway, declared his intention in 1927. It is held that he has failed to meet the condition of five years' continuous residence in the United States. The Byrd antarctic voyage took him out of the country, although he was on a ship carrying the American flag, was an invaluable member of the American expedition, and in a region to which there is an American claim because of the exploration and occupation of it by Americans, this region being called Little America.

The Bureau of Naturalization explains that it cannot proceed on the assumption that Little America is American soil. That would be trespass on international questions where it has no sanction. So far as the bureau is concerned, Balchen was

out of the country and technically has not complied with the law of naturalization. (Merton, 1968, p. 254, quoted from The Chicago Tribune, June 24, 1931, p. 10).

Popular proponents of bureaucratic reform (for example Ouchi (1981) and Peters and Waterman (1982)) have emphasized the benefits of nonspecialization within firms precisely because they recognize that nonspecialists have a wider range of experience than specialists and thus are less likely to have developed special bureaucratic personalities. Also, as consistent with our secondary theme in earlier examples, nonspecialists by nature are less isolated than specialists. The use of nonspecialists may break the isolation for the development of dysfunctional bureaucratic personalities.

Economic models of bureaucracy have typically been based on principal-agent theory. Their purpose is to derive optimal organizational structures, contingent on the technical nature of information flows. (Two excellent examples are Milgrom and Roberts (1988) and Holmstrom and Tirole (1988)). In contrast, my analysis suggests an alternative way in which information affects the performance of a bureaucracy. Bureaucratic structures which make specialized decisions may behave in "deviant" ways. In special cases such as dedicated scientists in the laboratory, the Green Berets, or the U.S. Forestry Service (see Kaufman (1960)) this isolation may be beneficial and the deviance quite functional.¹³ On the other hand, as we have seen, this same specialization may be dysfunctional. Entirely absent from the principal-agent model is the possibility that behavior changes occur latently in response to obedience to authority. While the theory of bureaucracy must address incentive problems (as in principal-agent problems), it should also consider the need to organize decision-making so as to create functional (rather than dysfunctional) changes in personalities.

IX. Conclusion

Standard economic analysis is based upon the Benthamite view that individuals have fixed utilities which do not change. Stigler and Becker and Becker and Murphy have gone so far as to posit that these utilities do change, but that individuals are forward-looking and thus foresee the changes that will occur. A more modern view of behavior, based on Twentieth Century anthropology, psychology and sociology is that individuals have utilities which do change and, in addition, they fail fully to foresee those changes or even recognize that they have occurred. This lecture has modelled such behavior in sequences of decisions, given examples from every day life, indicated the situations in which such behavior is likely to occur and, in some instances, suggested possible remedies. The theory of procrastination and obedience has applications to savings, crime, substance abuse, politics and bureaucratic organizations.

ENDNOTES

1. The exact loss is $Tx - c(1 + \delta)$. If I sent the box on date 0 V has value $c(1 + \delta) - Tx$. Since I sent the box at T , $V=0$. The difference is $Tx - c(1 + \delta)$.
2. The exact critical date is the first day on which the decision maker decides not to postpone: i.e. the smallest t such that $c - (T - t + 1)x < 0$.
3. Let us suppose that the daily utility cost of doing a project varies with the square of the number of hours worked per day, and that the project, without procrastination, would require Th hours of labor. Let us suppose that the daily utility cost of doing a project varies with the square of the number of hours worked per day, and that the project, without procrastination, would require Th hours of labor. Then we can write the intertemporal utility function as

$$U = \sum_{t=0}^T e_t^2.$$

where e_t is the number of hours worked on day t . Without procrastination the total utility cost of the project is

$$U = Th^2.$$

Let's now compare this to the cost borne by a procrastinator. For the procrastinator current costs are unduly salient in comparison with future costs. The salience premium is δh^2 , a multiple δ of the daily cost of the project if begun on time. The perceived cost of completing the project, if begun at date τ , is thus:

$$V = \delta h^2 + \sum_{t=\tau}^T e_t^2.$$

In each period the procrastinator compares the total cost, V , of the project if begun that day (including the added salience cost, δh^2 , of that day's input) with the cost of waiting one more day to begin, taking no account that when the next day arrives, it too will have special salience. Behaving in this way, the project is begun with approximately $T\delta^{-1/2}$ days left for its completion. This is a poor approximation for low values of δ because for low values of δ it does not pay to procrastinate. This increases the total cost of the project by a multiple which is the square root of δ . In this example, a small salience cost of beginning a project results in losses from future actions which are a multiple of the cost. For example if T is 100 days and δ is 2, the salience cost of beginning the project relative to the total non-procrastinating cost is only .02. But the total cost of completing the project increases by 41% ($\sqrt{2} - 1$).

4. I owe this observation to Janet Yellen.
5. Thaler and Shefrin (1981) discuss the role of Christmas Clubs in forcing the scheduling of savings. Their model of saving behavior, and of procrastination, is different from my model in this lecture. Their model discusses two types of decision-making: for long-term planning and for maximization of current utility. People may constrain themselves (i.e. may make arrangements such as Christmas Clubs) so that they can then be free to maximize their short-term utility without further constraint. In this way budgets act as mental accounts. The Christmas Clubs relative to my model set clear schedules for saving, which result in penalties if not followed, and thereby prevent procrastination.
6. It is also low because we might expect those without pension plans to be making up for prior failure to save as they near retirement, just as the procrastinating student has to work

especially hard near his term paper deadline.

7. This high rate may reflect the prior lives of poverty of the elderly population in 1966; this group spent much of their working lives in the Great Depression. But earlier statistics, from such indicators as the fraction of elderly living in poorhouses, show that the elderly had particularly high poverty rates in the 1920's, before both modern pension plans and the Great Depression (Dahlin, 1983).

8. In their advice book on Procrastination, Burka and Yuen (1983) urge potential procrastinators to set clear and realistic schedules for themselves and then adhere to them. In the preceding Stiglitz-box model, the determination of a schedule which was binding would have resulted in the box being sent on day one or day two. Thomas Schelling (1985, p. 368) has explained in similar terms why parents at the beach may give their children the clear advice not to go in the water at all, even though they do not mind the children getting a little bit wet. In the absence of a clear "schedule" telling the children when the water is too deep, they may wade ever deeper and end up in danger.

9. Ross suggests that if teachers had a red button to push which would allow them to stop the experiment very few subjects would have given the maximum dosage. In my model this would decrease the value of δ , the special salience attached to current disobedience.

10. In the case of the Unification Church such active intervention frequently occurred as members were captured by relatives and forcibly deprogrammed (Galanter, 1989).

11. Some of these differences undoubtedly are due to the concentrations of poor people with high crime rates in Central Cities, which are large in size.

12. An alternative account of Alliluyeva's decision to commit suicide and Stalin's activities on the night before is given by Khrushchev (1989). The two accounts are not mutually exclusive.

13. In the case of scientists it may not just be individual, but also group psychology under isolation, which results in the odd scientific personalities which result in the "mad scientist" image.

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