

THE DANGERS OF WILLPOWER

**Including the Exacerbation of
Addiction and Dissociation**

George Ainslie
Veterans Affairs Medical Center, Coatesville PA, USA
University of Cape Town, South Africa
George.Ainslie@va.gov

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Addiction and dissociation are puzzling phenomena that are not usually thought of as related, although they are often prominent in the same individuals. Both violate our conventions of rationality. Addiction entails the voluntary choice of options that the person himself reports he does not want. Dissociation is a temporary reversal of preference so extensive as to change what the person acknowledges as his "self;" such reversal, for which the person is amnesic, is seen to an extreme degree in multiple personality and to a lesser extent in fugue episodes, "blackouts," and the experience of spirit possession. Economic Man, the conventional utilitarian model of how people evaluate choices (Stigler, 1980), explains neither, much less suggests any reason why they should tend to appear together.

Empirical research on the relationship of dissociation with volitional lapses like addictions has been sparse. There is a high correlation between dissociation and other self-control disorders: 39% of 100 substance abuse patients have been reported to also have a dissociative disorder (Ross et.al, 1992), as have 41% of 265 male veterans in a substance abuse program (Dunn et.al., 1993). Patients with eating disorders also have high rates of dissociative disorder (McCallum et.al., 1992; Zerbe, 1993). Furthermore, a large proportion of drug addicts have post-traumatic stress disorder (eg. 59% of a female drug rehabilitation population-- Fullilove et.al., 1993), which entails many dissociative symptoms. However, these findings only suggest an important relationship between addiction and dissociation; they do not shed light on what it is.

The boundaries of the concept of addiction are in dispute, but the core meaning of the term is evident from its etymology: The term originally meant judicial enslavement, as when a person was sentenced (ad-dicted) to serve another (Oxford English Dictionary), so that as a metaphor it clearly means enslavement by an appetite. Ample experience with addicts has shown that this enslavement comes not from a fear of withdrawal symptoms but from the continuing wish for a high, which often causes relapse after years of sobriety. Modern science has had increasing success in isolating the reward mechanism that makes the substance-based addictions extraordinarily attractive (Gardner, 1992 and this volume); but this attractiveness does not explain the sense of slavery. Missing is an explanation for the addict's ambivalence, that is, why he regularly pursues a goal that he says he wants to get away from.

Scientific theories have avoided confronting the conundrum of ambivalence: They hold either that the addict does not realize the contingencies he faces, or that the pain is worth it to him; Economic Man has so little trouble maximizing his prospects that he cannot knowingly be enslaved. True, he can suffer from erroneous expectations and thus stumble innocently into a downward spiral of conspicuous pleasure followed by insensibly diminishing options, the "primrose path" described by Herrnstein and Prelec (1992); and he can have a very steep temporal discount function which makes him simply take no interest in the future like the "rational addict" described by Becker and Murphy (1988). However, continual maximizer that Economic Man is, he cannot have the familiar human experience of looking forward with apprehension to a behavior that he knows he will regret; nor does he ever have a reason for buying disulfiram or naloxone, means for limiting his own future choices to forestall such a behavior. In short, he cannot have motivational conflict beyond an uncertainty about magnitudes.

Thus conventional utility theory could explain without further assumptions both a naive subject's entry into addiction and an experienced user's unambivalent preference for his substance use over sobriety; but it does not explain an addict's internal conflict, as evidenced in the extreme case by his attempts to restrict his own future freedom of choice.

Despite these difficulties, addiction could theoretically be explained by a variability in the addict's estimate of his future prospects, however unaccountable, in someone with consistent values. Dissociation is more mysterious by far; it represents a regular reversal of those values themselves, a change that may block access to all memory of times when the person's values were different. Such changes of character might seem to be out of the person's control, a neurological calamity like epilepsy, but actually they are well known to be motivated (Putnam, 1989). If utility theory has had difficulty explaining addiction, it has not even attempted to analyze something as irrational as the harboring of whole contradictory selves.

I will show that it is possible to reconcile both addiction and dissociation with strict maximization of utility, in light of recent evidence that a basic assumption of conventional utility theory has been wrong. I will also deduce a relationship of these two seeming paradoxes with a reliance on willpower for self-control, and suggest a relationship with each other.

1. Picoeconomics Predicts Self-Defeating Behaviors

I have argued elsewhere (1975, 1992) that the exponential discount curve by which people evaluate delayed goods in conventional utility models cannot predict irrational choice. However, controlled experiments have found a substantially different curve describing how the effect of a reward declines with delay, a curve that can be elicited in all higher organisms; this curve is not exponential but hyperbolic (Ainslie, 1974; Ainslie & Herrnstein, 1981; Ainslie & Haendel, 1983). It is an aspect of Herrnstein's matching law (Herrnstein, 1961) that has been confirmed by a number of researchers (Green, Fry & Myerson, 1994; Kirby & Herrnstein, 1995; Stevenson, 1986).

Hyperbolic curves predict that people will regularly form temporary preferences for the smaller but earlier of many possible pairs of alternative rewards, a preference pattern that in turn can account for a number of phenomena that had previously seemed paradoxical (an analysis I have called picoeconomics; Ainslie, 1992).¹ Many people balk at accepting a hyperbolic discount curve as fundamental, since at first glance it seems incompatible with the exponential discount curves that accurately describe a great deal of human economic behavior. However, the aggregate effect of hyperbolic curves on whole classes of choice can produce the appearance of exponential curves under some circumstances (Ainslie, 1991). The identification of exponential discount curves as special cases within a framework of hyperbolic discounting liberates motivational theory from these curves' relentless prediction of rationality.

I cannot present a comprehensive exposition of picoeconomics here; but since several of its predictions combine to offer a rationale for addiction and dissociation, I will summarize them and refer the reader to specific parts of a fuller discussion (Ainslie, 1992):

¹ People's preference for an addictive substance is sometimes not temporary, especially early in their consuming careers. An observer with superior foresight might say that it would be temporary, if only they knew... "If a person does not wish to quit under the prevailing circumstances, he would still be considered addicted if he would find it very difficult to quit under circumstances that generated a wish to quit. This person would be called a consonant addict (Skog, this volume)." However, addiction in this sense is an ordinary taste; such a taste would not puzzle us if it did not typically lead to a stage in which the person recognized his error but could not escape-- in other words, to enslavement.

The effect of regular temporary preference is to make all motivated processes compete for survival against incompatible processes, and to give them an incentive to strategically forestall these competitors. The "mind" or "self" is a population of reward-seeking operations that survive insofar as they actually obtain reward. The mental operations selected for by a particular reward or class of reward constitutes the person's interest in that reward; interests within the person are very like interests within a community-- those factions that are rewarded by ("have an interest in") the goal that names them (e.g. "the petroleum interest," "the arts interest"). Since a common marketplace of reward² keeps a person's purposes coherent except where conflicting rewards dominate at successive times, it makes sense to name an interest only where that conflict exists, i.e. where the success of one process depends on its forestalling another process that would otherwise become dominant and undo the work of the first process. I would not be said to have separate chocolate and vanilla ice cream interests, even though these are often alternatives, because at the time when I prefer chocolate I do not increase my prospective reward by forestalling a possible switch to vanilla. But I may have an ice cream interest and a diet interest, such that my expectable reward from the diet is intermittently threatened by an immediate prospect of ice cream. I do not increase my prospective reward in either the long or short range by defending my choice of chocolate against the possibility that I may change to vanilla; but I increase my prospective long range reward by defending my diet against ice cream, and I increase my prospective short range reward by finding evasions of my diet for the sake of ice cream. Whichever faction promises the greatest reward, discounted from its expected time of occurrence to the present moment, gets to decide my move at this moment; the sequence of moves over time determines which faction ultimately gets its way.

Where alternative rewards are available at different times, each will build its own interest, and one interest will forestall the other only if it can leave some enduring commitment that will prevent the other reward from occurring: If my diet interest can arrange for me not to get too close to ice cream, the discounted prospect of ice cream may never rise above the discounted prospect of the rewards for dieting, and the diet will have effectively won. However, whenever the value of ice cream spikes above that of dieting, the ice cream interest may suddenly undo the effect of many days of dieting. The ultimate determinant of a person's choice is not his simple preference, any more than the determinant of a legislature's action is simple voting strength; in both processes, strategy plays a major part.

This model of hyperbolic discounting might seem to make self-defeating behaviors like addiction a straightforward problem. Once a person has identified a recurring preference as temporary, he should be able to commit himself not to give in. However, the solution is not that simple, as we will see.

Self-commitment is certainly a familiar behavior. Even pigeons have some ability to do this: After varying amounts of experience with their own strong tendencies to choose the poorer but earlier of two alternative food rewards, they can learn to forestall these tendencies somewhat. If a particular route to the largest available reward goes through some point A, where they can choose a poorer, earlier alternative reward, many subjects learn to take the longer or more effortful route through a different point B that avoids this peril (Ainslie, 1974). To some extent

² The broad substitutability of behaviors in a limited channel of expression must constrain diverse possible reward centers to be comparable along a single dimension for purposes of selection. That dimension is best called reward (Ainslie, 1992, pp. 28-32; Schizgal & Conover, 1996).

pigeons can even achieve this internally, that is, without the experimenter offering them a route through B that physically keeps them away from A (Mazur and Logue, 1978).

This last finding raises the question of what other committing tactics are possible, for pigeons or for people. Perhaps these subjects have learned to keep their attention away from cues that, once seen, offer the choice of a temporarily more valued smaller reward; perhaps they are learning to think "cool thoughts" instead of building their appetites for the reward, as the Mischels' five-year-old children report doing (Mischel & Mischel, 1983; more discussion in Ainslie, 1992, pp. 130-142). The most interesting possibility is that they are forming elements of willpower-- resolutions or intentions as the philosophers of mind picture them (Bratman, 1987). That is, they may be evaluating choices as members of larger categories.³ For exponential discounters this would have no effect on choice; but for hyperbolic discounters it would let the disproportionate effectiveness of an immediate temptation be averaged in with the more objective, albeit discounted, evaluations of many similar prospective choices in the future. Categorical choice might allow subjects to evaluate and reject temptations with "both alternatives steadily held in view," as William James characterized the effort of will (1890, p. 534).

The stabilizing effect of deciding "on principle" has been recognized since Aristotle (1984, 1147a24-b17) and was well known to the Victorian psychologists (see Sully's quote in the last footnote, as well as James, 1890, p. 534). It has recently been verified by the same kind of experiments that demonstrated the matching law: Even pigeons will choose a larger, later reward over a smaller, earlier one more often if this choice is part of a series of choices than if it stands alone, an effect that Rachlin has attributed to his subjects' adoption of a "molar," i.e. global, framework of the choice in place of a "molecular," one-by-one framework (1995). Similarly, Heyman has demonstrated how a consistent signal associated with the better long range choice leads pigeons to increase that choice, a change he explains in terms of the signal's having supplied his subjects with an "overall" versus a "local" perspective on the outcomes (1996).

However, the increase in both pigeons' and children's capacity to wait for the larger reward is small in these experiments-- usually less than double. There is reason to believe that even grouping choices together in series, while necessary for genuine willpower, will not be sufficient. That is, there is nothing in the process of molar or overall categorization per se that prevents a short range interest from distinguishing each current choice from the molar category. Choices in potential series will all have unique as well as common features, which can be a basis for excepting them; addictive motives are notorious for subverting general plans of conduct by establishing the example at hand as a special case (as in James' famous list of drunkard's excuses-- 1890, p. 565). Somewhere, perhaps in the long exploration of social rules that takes place in the grade school years (Piaget, 1965), humans discover the power of the test case, of focusing on their own choice between molar and molecular interpretations of a current example as a predictor of what they can expect of themselves in similar cases in the future.⁴ People soon learn that the outcome of such tests weighs on subsequent choices that look similar, and that the

³ "[When] particular actions are united under a common rule, they are viewed as members of a class of actions subserving one comprehensive end. In this way the will attains a measure of unity (Sully, 1884, p. 631)."

⁴ It turns out that pigeons do not discover this, that is, that even when they have learned some resistance to temptation they have not come to perceive their own choices as precedents (Ainslie, 1982) [Now available as "Internal self-control in pigeons" on www.picoeconomics.org.]

threat of losing one's expectation of future self-control can marshal a great deal more motivation than depends on the single case at hand. Intention policed by such a strategy is experienced as something transcendent: will, or resolve, or moral determination. Perhaps this is even the "knowledge of good and evil" that gave Man self-will and mythically ended his career in the Garden of Eden (Genesis 3).

The perception of test cases, in individuals or in interacting groups, gathers motivation remarkably. Relevance to a diet greatly changes the incentives for eating vs. not eating a single piece of candy, just as fluctuations in the price of a "bellweather" stock have a disproportionate effect on the whole stock market.⁵ Furthermore, it can be shown that perception of a series of choices as test cases for a common rule should shape the relationship of successive choosing selves into a familiar relationship, limited warfare (Schelling, 1960, pp. 21-80), the properties of which are described by a well-known bargaining game, the repeated prisoner's dilemma (Ainslie, 1992, pp. 142-179). This is to hypothesize that willpower achieves deterrence against each individual impulse through the fear of setting precedents for whole strings of future impulses. The personal rules that define what is to be seen as cooperation in this bargaining process seem identical to the principles specified in Kant's categorical imperative (1792/1960, pp. 15-49) and Kohlberg's highest stage (VI) of morality (1963), and thus appear at first glance to represent rationality itself. Certainly they give molar or overall views of reward great leverage over molecular or local ones. It might indeed seem that they should solve the problem of addiction.

2. Willpower Is an Awkward Expedient, Not the Ultimate Rationality

Unfortunately, a person's perception of the prisoner's dilemma relationship and the willpower that results from this perception do not really solve the problem of temporary preference. Willpower may be the best expedient we have⁶; but it turns out to have serious side effects that

⁵ The movements of a bellweather stock affect the market proportionately as investors are sensitive to test cases, that is, as they behave like "portfolio insurers" rather than "value-based investors" (Ferguson, 1989).

Similarly, the sensitivity of an individual's self-control to the outcome of test cases may vary. A person who is not greatly worried about his overeating or smoking, but is "just trying to cut down," may have frequent fluctuations into greater consumption without noticeably damaging his willpower. At the other end of the continuum, someone who is strongly motivated to cut out these behaviors and is threatened by any sign that they are returning may subject himself to such scrutiny that every relevant choice is a crucial test. He will stake such importance on a single lapse that, if it ever occurs, it will lead to helpless surrender. The "first drink" phenomenon has been such a conspicuous cause of alcoholics' loss of sobriety that it was once thought to be a physical reflex (Evenson et.al., 1973). This will be discussed below in the section on how personal rules magnify lapses.

⁶ The empathic disengagement that characterizes a cosmopolitan society makes the most obvious alternative form of impulse control, tolerating one's vulnerability to social pressure from the community, unreliable and sometimes treacherous. The bigger the community in functional terms, the more often one encounters disengaged predators who can exploit his openness to engagement, a situation that encourages him to cultivate disengagement in turn. This disengagement is concealed by the friendly informality that is actually one of its symptoms, a sign of a "growing aversion to emotional intensity, [an aversion] that such informality requires (Stearns, 1994, p. 11)." The change is well expressed by the twentieth century cultivation of

become major factors in people's lives. I argue that these side effects are what shape the problem of addiction as the clinician encounters it in a developed society; that they link addiction to other phenomena, particularly dissociation, which have seemed anomalous in any rigorous theory of behavior; and that they are little recognized, leading even the best-intended advice to bring perverse results both in individuals and in social policies.

Although personal rules can sometimes lead an individual to approximate an exponential discount curve for future events, they do not give him the prelapsarian trait of maximizing his expected utility whenever he makes a choice, nor do they preserve the experience of spontaneity in choice-making. Rule-governed choice has four properties that cause it to fall short of these utilitarian ideals:

1. Categories of choice come to overshadow their individual members, resulting in a legalistic manner of choice-making.
2. Rules make lapses disproportionately damaging, and tend to turn them into permanent symptoms.
3. Rules create a motive to distort the perception of reality.
4. Rules need not be in the person's longest range interest.

Categories of choice overshadow their individual members. The perception of choices as precedents often makes a choice much more important for its expected effect on future choices in the intertemporal prisoner's dilemma than for the rewards that literally depend upon it. Insofar as this is true, choice becomes detached from the properties of its objects and takes on an aloof, legalistic quality. In the parlance of existential therapists the person becomes "inauthentic" (Kobasa & Maddi, 1983).

A person is often hard put to predict how his own future selves will perceive the precedent his current choice is setting. This makes cooperation in intertemporal prisoners' dilemmas both rigid and tenuous. Unless chance provides clear lines that can be used as boundaries it may be difficult to tell whether, facing a choice in the future, he will look back at his current choice and judge it to have been a lapse.

The difficulty of this task depends on topography of the range of options. A person trying to give up a heroin habit at least benefits from the bright line⁷ between some heroin and no heroin; but a person trying not to overeat has to make judgment calls continually about what food to allow himself, even if he has committed himself to one single diet. In consequence a short-term interest within the individual can usually offer a colorable exception to a diet, and may escalate such proposals by degrees until the diet has been rendered useless without ever having been clearly violated.

emotional "cool." Beginnings may be visible in Beau Brummel's introduction of the "stiff upper lip" to fashionable Regency society, which was at least a conspicuous milestone of our escalating competition in imperviousness to influence (Cole, 1977). However, there may be important gender differences in the progress of this trend (Gilligan, 1982).

⁷ Lawyers and other negotiators developed this useful term, meaning a boundary that stands out in some unique way from other boundaries that might be proposed. Bright lines have the effect of stabilizing negotiated settlements against shifts in boundaries from small changes in the balance of bargaining power. See Ainslie, 1992, pp. 163-173.

Under the pressure of temptation, a person may claim an exception to a rule but later see the claim as unsupportable, that is, see himself as having had a lapse. Conversely, he may be cautious beyond what his long-range interest requires, for fear that he will later see his choice as a lapse-- a rationale that exacerbates compulsiveness. Errors in either direction impose costs that would never result from the exponential curves of Economic Man, since these curves would create no reason for discerning precedents in the first place.

Rules magnify lapses. When a person violates a personal rule, the cost is a fall in his prospect of getting the long range rewards on which it was based. This prospect is what he uses to stake against the relevant impulses; a lapse suggests that his will is weak, a diagnosis that may actually weaken his will in the recursive pattern described long ago by James, Lange, and Darwin (James, 1890, vol. 2, p. 458; Ainslie, 1992, pp. 200-205). To save his expectation of controlling himself generally, he will be strongly motivated to attribute the lapse to a particular aspect of his present situation; the consequence may be that he abandons his attempts at willpower whenever that aspect is present. That is, he may create a class of exceptions rather than suffer a general loss in the credibility of his will-- to decide that he can't resist the urge to panic when speaking in public, or to lose his temper at incompetent clerks, or to smoke after meals. Thereafter the occasions for these urges will seem to bring on the behaviors automatically, without an intervening moment of choice.

In other words, exceptions to personal rules need not arise through deliberate rationalization; an exception can impose itself on the person's intentions in the most awkward of places, wherever a lapse has threatened a broad loss of impulse control. When he has been using his willpower to control panic, or rage, or smoking in a particular setting, and his will has been overwhelmed, he will be under pressure to distinguish that setting from all others so that he will not see his lapse as a precedent for his choices generally. His discrimination of this special circumstance has a perverse effect, since whenever he faces it he sees only failure predicting further failure. I have called this area, where the person dares not attempt efforts of will, a lapse district, by analogy to the vice districts in which Victorian cities tolerated the vice that they lacked the political will to suppress (1992, pp. 193-197). Where the encapsulated impulses are clinically significant, clinicians call a lapse district a symptom. In this way the perception of repeated prisoner's dilemmas stabilizes not only long range plans but lapses as well.

The availability of boundaries to circumscribe a potential lapse district may determine whether it will form in the first place. Lapses are goal-directed behaviors, and thus not beyond the influence of long range rewards; lapses endanger these rewards less when there is a boundary that can limit their implications. Short range interests prosper most when they parasitize, as it were, rather than kill, long range interests. Thus the uniqueness of a vacation trip may make a spendthrift more apt to go off his budget; likewise, an alcoholic may find lapse districts forming in time-limited circumstances, e.g. only when he has just completed a project or a school year or an election campaign.

The boundary may be intrinsic to the kind of reward involved. Many "out of control" consumption patterns commit the addict to withdrawal sickness followed by a period of abstinence before the substance is rewarding again. The crude periodicity of such a cycle may permit him to stably apportion his ambivalence into two successive, contradictory activities. Then the trigger for a binge may be nothing more than a perceived lapse itself: His willpower governs until it stumbles, but as soon as he has a drink or fix he experiences a "loss of control" and winds up on a bender (Evenson et. al., 1973; for a similar loss of control in dieting, see

Polivy & Herman, 1985); his will when sober will be preserved by his perception of the drunken state as a lapse district. In the period of exhaustion that ends the bender his "normal" will can reassert itself, but only until a regenerated appetite for the addictive activity again asserts itself in a lapse. He will have two distinct selves, an intoxicated one and a sober one.⁸ By contrast, a rapidly satiating activity like smoking will never reach the proportions of a binge; here any regular alternation between control and loss of control must be cued by something other than intrinsic exhaustion and recovery.

Rules motivate misperception. Personal rules depend heavily on perception-- on noticing and remembering one's choices, the circumstances in which they were made, and their similarity to the circumstances of other choices. Since personal rules organize great amounts of motivation, they naturally create an incentive to suborn the perception process. When a lapse is occurring or has occurred, it will often be in both the person's long and short range interests not to recognize that fact: His short range interest is to keep the lapse from being detected so as not to invite attempts to stop the forbidden behavior. His long range interest is also at least partially to keep the lapse from being detected, because acknowledging that a lapse has occurred would lower the expectation of self-control that he needs to stake against future impulses.

After a lapse, the long range interest is in the awkward position of a country which has threatened to go to war in a particular circumstance that has then occurred. The country wants to avoid war without destroying the credibility of its threat, and may therefore look for ways to be seen as not having detected the circumstance. The person's long range interest will suffer if he catches himself ignoring a lapse, but perhaps not if he can arrange to ignore it without catching himself. This arrangement, too, must go undetected, which means that a successful process of ignoring must be among the many mental expedients that arise by trial and error, that are retained simply because they make the person feel better without his realizing why.⁹ Money disappears despite a strict budget, and people who "eat like a bird" mysteriously gain weight. Clouding of consciousness in the face of temptation has been reported by observers from Aristotle (Bogen & Moravcsik, 1982) to Sjoberg & Johnson (1978). Here is a motivational

⁸ This description of symptom formation as a product of intertemporal bargaining is not meant to negate the importance of biological preparedness for temptations in motivating lapses. The tastes for alcohol or thrills that make some risk-taking styles highly heritable are increasingly being traced to innate differences in the physiology of emotion (Cadoret et.al., 1986; Grove et.al., 1990), as are shorter range urges like fearfulness and pain sensitivity (Kendler et.al., 1992; Skre et.al., 1993; Panocka et.al., 1986). Great urges may overcome even well-drawn rules. However, even a middling urge may overcome badly functioning rules. Where rules are overly strict or just poorly drawn they may permit too little reward to sustain them against ordinary challenges. Thus bulimic patients may just be poorer lawyers than the anorectics who succeed in never bingeing, in that they cannot formulate sustainable rules for this purpose; and anorectics in turn feel a need to resist longings that people with more adaptive rules can gratify without fear of losing control.

⁹ As Erdelyi has pointed out (1990), the unconscious but goal-directed effort to forget that the psychoanalysts call repression does not differ in nature from the conscious kind (suppression). I would suggest that its unconsciousness is shaped by the incentive to avoid losing the stakes of personal rules.

pattern that could easily create a black market, indeed an underworld, of those behaviors that include blockage of notice and recall.

Rules need not serve the person's longest range interest. There is a puzzling class of behaviors that are more stable than the addictions but that a person still perceives not to be in his "best" interest. Whereas bouts of addictive behavior are preferred for periods of minutes to days, these more stable behaviors are preferred for years, or indefinitely, but are still accompanied by a sense that they will be regretted. Compulsions, dieting in anorexia nervosa, and making oneself impervious to emotion in alexithymia (Nemiah, 1977) are clinical examples, but many highly systematic "character flaws" like miserliness, fastidiousness, and overcontrol never come to a clinician's attention. These maladaptively narrow behaviors lack a generally accepted name; I have called them *sellouts*.¹⁰ [In later writings I have called them *compulsions*—GA] Sellouts create a sense of enslavement like the addictions, but are apt to be more systematic and may even seem rational, because they are often based on personal rules. That is, sellouts can combine against both longer and shorter range interests:

Although the combinatory mechanism of personal rules obviously requires them to serve longer range interests against shorter range ones, they need not serve the person's longest range interests. Some rules may even group such mid-range payoffs together so as to steal dominance from longer range payoffs, without violating the strict logic of hyperbolic discounting (Ainslie, 1992, pp. 216-224). The relationship of a person's longest range interest with sellout and addiction range interests is illustrated by Jon Elster's example:

I wish that I didn't wish that I didn't wish to eat cream cake. I wish to eat cream cake because I like it. I wish that I didn't like it, because, as a moderately vain person, I think it is more important to remain slim. But I wish I was less vain (1989, p. 37 note).

Assuming that his wish to be less vain does not merely serve his wish for cream cake, it reveals a perception that vanity is not in his longest range interest-- that he will regret it even though it dominates his current choice. That is, he sees vanity as an overly narrow trait, a sellout. His vanity is in turn threatened by a tendency to eat cream cake; assuming that episodes of seeking cream cake dominate his choice for a matter of minutes to hours, they represent temporary preferences of roughly the same duration as those in addictions.¹¹ Under these circumstances the vanity will be able to foster a personal rule against eating the cake, i.e. a diet, even though it may contradict the still longer range interest in not being vain. This will be true as long as this longest range interest cannot find effective criteria that would make a rule against the vanity practical. It is on the availability of such criteria (= bright lines) that contests among relatively long range interests seem to depend:

¹⁰ The person might be said to have "sold out" his subtler or richer interests for the reliability of a system.

Two ranges of temporary preference shorter than addictions-- itches and pains-- can also be discerned in common experience (Ainslie, 1992, pp. 98-114), but they are not important for this discussion.

¹¹ I use overeating and dieting as illustrations frequently, not because they seem to be pivotal, but because they are probably the most well-known concerns about temporary preference in common experience.

In seeming inversions of the interests' power relationships-- where a sellout range interest that is protected by a rule dominates the person's longest range interest-- the decisive factor may not be how well a rule would pay if enforced, but how well it can be enforced. Enforceability depends in turn on how clearly each choice is either a member or not a member of the relevant series.¹² That is, personal rules operate most effectively with countable criteria. Thus rules against acts of vanity are apt to be much less enforceable than rules against overeating.

The impact of having rewards marked by discrete stimuli is illustrated by recent experiments on "melioration:" Human subjects had to choose between amounts of money such that choice A produced a conspicuously larger reward than choice B, but choice A led to poorer subsequent payoffs for both choice A and B (Herrnstein and Prelec, 1992). Where choice of a larger amount reduced the amounts to choose from on subsequent turns, most subjects soon discovered the strategy of picking the smaller amount in the current choice. However, where choosing the larger amount led not to smaller amounts but to greater delay before subsequent choices, thus reducing total income in a game of fixed duration, subjects tended to keep picking the larger amounts and getting smaller returns (Herrnstein et al., 1993). Amounts are eminently countable; delays are vague unless someone specifically thinks to count the seconds. As we might expect, when Herrnstein pointed out to his subjects the greater delay that came from choosing the larger reward, they, too, generally started choosing the smaller.¹³

Thus when sellout range interests are based on well-marked rewards, and their richer, longer range alternatives are harder to define, the sellouts may win the protection of personal rules. Rules that serve sellouts are particularly apt to become dominant when the person has had a conspicuous addiction range interest that has motivated strict controls, as in the case of the anorectic patient who finds his draconian diet worthwhile to end a history of overeating. It is easier to enforce specific rules about diet than more subtle rules like "eat what you need" or "eat what you will be glad of in retrospect," though if the latter were enforceable rules they would permit the most reward in the long run. When a person seeks the comparative safety of the most clearcut criteria for his personal rules, he may be forestalling not only short range impulses but also the richest long range rewards.

Extreme commitments to personal rules are widely recognized as compulsions. But even short of frank compulsiveness, the systemization that lets personal rules recruit the greatest motivation may undermine the very purposes that inspired them. The attempt to optimize our prospects with rules confronts us with the paradox of definition: that to define a concept is to alter it, in this case toward something more mechanistic. A person who concludes that he should maximize money becomes a miser; one who rules that he should minimize his openness to emotional influence becomes alexithymic (Nemiah, 1977); if he concludes he should minimize risk, he becomes obsessively careful; and so forth. The logic of rules may so come to overshadow a person's responsiveness to experience that his behavior becomes formal and

¹² Another factor, how sharply this series stands out against alternative series that could be substituted, was discussed above with bright lines.

¹³ Admittedly, melioration procedures with humans study subjects' awareness of rewards rather than their self-control; there should be little urge to favor small-early cash rewards when the cash can't be spent until the end of the experiment anyway. However, the advantage that countable rewards have over subtler ones in this purely informational problem should also be present when self-control is involved.

inefficient. A miser is too rigid to optimize his chances in a competitive market, and even a daring financier undermines the productiveness of his capital if he rules that he must maximize each year's profit (Malekzadeh & Nahavandi, 1987). Similarly, strict autonomy means shielding oneself against others' ability to invoke his passions, but the alexithymics who have accomplished this cannot effectively use the richest strategy available for maximizing reward, the cultivation of human relationships (Ainslie, 1995 and in preparation). And avoidance of danger at any cost is poor risk management.

Furthermore, beyond the inefficiency of hidebound rules in obtaining their ostensible goals, piecemeal analysis predicts a reduction in their emotional payoff that occurs insofar as they do succeed: Optimal exploitation of the available reward for any game-like activity requires the maintenance of suspense, but hyperbolic discount curves create a short-sighted impatience for resolution that can be effectively resisted only by committing oneself to be surprised (Ainslie, 1992, ch.7). That is, imagination attenuates through an innate impatience to entertain its high points at the cost of prematurely resolving emotional tension, thus increasingly wasting the relevant appetite as the person gains experience with a given situation. The more efficient a person learns to be at overcoming a challenge, or the more familiar he becomes with a story, the more he will anticipate its resolution and undermine the longing needed for relatively intense satisfaction. Thus the various mental diets that let the person maximize wealth, or autonomy, or safety reduce by their very efficacy the amount of surprise he is subject to. Since surprise is the key factor in appetite for emotional experience, the maximization process is apt to become stale, even if it is working well. This seems to be how nature keeps organisms exploring novel areas instead of resting on their laurels. A consequence is that clarity per se predisposes rules for pacing emotional rewards to serve sellout range interests.¹⁴

Of course in many cases a person never regrets maximization schemes like anorexia and miserliness, so that these are held to be inferior choices only in an observer's estimation (raising, as with alleged addictions that the person himself does not recognize, the question of tastes); but often the person regrets them intermittently, or blames them for spoiling his happiness without being able to devise a rule structure sufficient to motivate their abandonment. Perhaps the person initially tried less concrete rules such as to do what he would be glad of in retrospect, and found they could not hold their own against more specific prescriptions; his "consistent preference" for the more concrete rules is then just acquiescence in their seeming inevitability.

Personal rules convert changes of preference that depend on proximity to temptation into the simultaneous conflicts that seem more numerous (Ainslie, 1992, p. 193). Getting drunk no

¹⁴ However frustrating this phenomenon is to the hedonist, it is liberating for motivational theory, since it suggests how "process rewards," those that do not depend on a hardwired releasing stimulus, can compete on equal terms with biological need-satisfiers. A person is physically able to summon the most powerful of emotions-- joy, terror, love, hate, etc.-- without external stimuli; but insofar as he does so without occasions that are both adequately rare and adequately unpredictable, the absence of suspense will turn them into mere daydreams; such direct approaches will generally extinguish.

This phenomenon selects for strategies that use optimally unpredictable events to cue their process rewards (joy, etc.), and demands continual growth or replacement of these strategies as their finding of occasions becomes so efficient that these occasions become common or predictable (Ainslie, 1992, ch 8). This model frees the observer from a search for "curiosity drives" and "conditioned emotional reactions," and brings all motives into a single marketplace.

longer depends on how close one gets to a bottle, but on whether an ongoing search for excuses finds a believable one. With characterologic choices like anorexia or miserliness the temporal basis of the conflict is harder still to see; but the payoffs even for these abstemious behaviors are clearly a current sense of some kind of wellbeing, at the expense of any realistic expectation of feeling glad of one's choices later.

In these four ways elementary motivational conflict is sharpened and its stakes raised when it is structured by personal rules. After the need for clarity has taken its toll on subtlety, and overcaution on flexibility, and undercaution with its consequent failures on resolve and self-observation-- in short after the makeshift nature of our attempt at global perception has caught up with us-- the conflict between global and local approaches to choice-making is no longer simply one of long vs. short range interests. Given the distorting effects of both hyperbolic discounting and the personal rules that compensate for it, "rationality" becomes an elusive concept. Insofar as it depends on personal rules demanding consistent valuation, rationality means being systematic, but systemization readily goes too far and winds up advancing a person's mid-range interests against his longest range ones. Sometimes a particular global approach is less productive in the long run than local, myopic alternatives, as anorectics and misers discover to their bewilderment.

3. Side Effects of Willpower Foster an Interaction of Dissociation and Addiction

Experiential underworlds-- classes of goal-directed behavior that the person cannot report-- have often been described, but theorists have been hard put to make sense of them in motivational terms.¹⁵ Modern parlance characterizes the formation of underworlds as "dissociation," a person's blockage of information about one experience while he is having another. Hypnosis experiments (Hilgard, 1977) and observations of unusual natural phenomena like multiple personalities (Putnam, 1989) and psychic amnesia (Schacter and Kihlstrom, 1989) have characterized the experiencing entities (the various "selves") as parallel and potentially autonomous, with radically divergent value systems. One of these value systems is almost always conspicuously impulsive, while another is conventionally prudent.

Current belief about dissociation attributes it to a combination of innate cognitive predisposition and a strong acquired motive to avoid intrusive traumatic memories (Spiegel, 1991). The relation between these two factors is in dispute, but there is usually agreement that dissociation is motivated by the dysphoria of intrusive thoughts. I will refer to this as hypothesis A.

This hypothesis suggests only a minor relationship between dissociation and addiction: Concomitant abuse of some substances may physiologically augment the repression, but non-substance addictions should neither cause repression nor be caused by it. I will briefly comment about recent research on this mechanism, then suggest two additional motives for dissociation which arise from personal rules and have a more intimate relation to addiction range motives: Dissociation can protect useful personal rules (hypothesis B.) and may offer relief from

¹⁵ Freud's "unconscious" organized centuries of puzzled observations (Ellenberger, 1970; Whyte, 1960), but the "repression" that he said created it confounds the impulsive diversion of attention from unpleasant truths with the impulse-controlling diversion of attention from temptations; it can be reconciled with strict utilitarian accounting, but only by the additional assumption of hyperbolic discounting (Ainslie, 1992, pp. 35-39, 133-135).

oppressive ones (hypothesis C.); in both cases it would do this by strengthening the encapsulation of lapse districts, which would in turn provide occasions for the dissociations. Any of these three mechanisms might operate side by side with any of the others.

A. *Dissociation avoids intrusive thoughts.* Some individuals seem to have more of a bent for dissociating than others. Perhaps ten percent of a general population have spontaneously entered experiences that they could not report afterwards or that they discovered only by external evidence-- "waking up" in a different place or being told of it; two percent do so repeatedly (Ross et.al., 1990). The latter are said to have a dissociative disorder. Observers have long noticed that dissociation seems to go along with an unusual aptitude for directing one's attention. High dissociators do not readily compare one part of their experience with other parts, but become totally "absorbed" in one to the exclusion of others (Crawford et.al., 1993; Roche & McConkey, 1990). Hypnotizability is another associated trait. Whether from heredity (Crawford & Gruzelier, 1992) or learning, about a fifth of the population can follow a suggestion to experience events that they cannot remember at other times (Hilgard, 1965). These highly hypnotizable people also report a great degree of absorption (Smyser and Baron, 1993).

The relationship of dissociation with these attentional factors is not surprising. In motivational terms, hypothesis A states that dissociation represents an extreme use of attention control-- the restriction of information-gathering-- as a tactic for controlling very short range urges:¹⁶ Those trauma victims who have predispositions to dissociate use their powers of absorption to divert their attention from the triggers of intrusive memories, until the strength of the unsatiated intrusive urge is enough to attract it back; and during their subsequent surrender to these memories they protect their long range interests from association with them by repressing those interests in turn.

The source of the intrusive memories has seemed obvious: A large percentage of dissociators report a history of trauma (Putnam, 1989), and a large percentage of people with post-traumatic stress disorder (PTSD) dissociate (Branscomb, 1991). PTSD is increasingly recognized. It is now said to affect 12% of the population, or at least of its females, at some time, and 5% at any given time (Resnick et.al., 1993). However, the role of trauma in dissociation is complicated by the relationship of PTSD with another trait, fantasy-proneness. There is a group of people who readily generate vivid fantasies of both rapture and dread; one to two percent of the population is said to be capable of fantasy experiences comparably vivid to those occasioned by actual physical stimuli, even food and sex (Wilson & Barber, 1983; Rhue & Lynn, 1987). Like PTSD patients, the fantasy-prone have intrusive thoughts which are easily triggered and which may undermine long range activities that require sustained attention.¹⁷ But the fantasy-prone are not

¹⁶ Certainly processes with very short latency periods from suggestion to adoption-- obsessions, hypochondriacal worries, vivid fantasies, traumatic memories, and other mental processes-- are poorly controlled by personal rules, probably because there is not time enough between the urge and the process itself to test the urge as to whether it is permissible (Ainslie, 1986). Diversion of attention from the pathway that brings up the urge should indeed work better than personal rules against very-short-latency processes.

¹⁷ Both groups also develop related self-destructive activities with a range of preference duration like that of addictions: Many traumatized patients voluntarily repeat their traumata (van der Kolk, 1989); and many high fantasiers become addicted to their fantasies at the expense of richer human relationships (Firestone, 1993).

merely like PTSD patients-- They often are PTSD patients, reporting histories of trauma at an extremely high frequency (Lynn & Rhue, 1988).

It has been impossible to say to what extent fantasy-proneness is a way people learn to cope with urges to entertain real traumatic memories, and to what extent an innate fantasy-proneness lures the person into elaborating or fabricating trauma fantasies that then have the vividness of memories. Certainly some people form convincing memories of demonstrably impossible experiences like prior lives, and can do so either spontaneously or under hypnotic direction (Spanos et al., 1991; Labelle et al., 1990); on the other hand, a large proportion of people who report childhood traumata can find independent corroboration of them (Herman & Schatzow, 1987), although this has not been studied specifically in people who are fantasy-prone. Whatever the interaction of trauma and fantasy, we know that fantasy-proneness is closely associated with attentional absorption (Rhue & Lynn, 1989), raising the additional question of whether an aptitude for directing attention creates exceptional fantasy abilities, or whether a proneness to exceptionally vivid fantasies motivates attention-controlling strategies like high absorption. Hypothesis A is obviously complex and in need of systematic study. In any case, it should probably be broadened to include intrusive thoughts that do not come from trauma.

B. Dissociation protects personal rules in the person's longest range interest. We would expect the processes of partitioning volitional lapses (side-effect #2 of willpower, above) and repressing them (#3) to reinforce each other, in that each limits the scope of personal rules. Either of these responses-- the lapse district or the information avoidance-- may occur by itself, but there is no reason that one need exclude the other. The cue that warns the person not to attempt willpower may tell him to block access to memory as well: Defining a lapse district will not completely protect the person's other prospects for impulse control, since even after distinguishing the circumstances of a lapse the person cannot be sure of how important his future selves will think the distinction is; it is hard to be sure that future selves will not see predictive implications in that lapse. However, forgetting a lapse will end its particular danger, albeit at the expense of strengthening the person's tendency to forget lapses in the future. Thus there is the potential for a synergy of repression and lapse district formation.

Once a lapse district has become established, its circumscribed extent will invite the person's other short range interests to exploit it as an opportunity for expression. For instance, the alcoholic's binges offer not only a limited period of drinking, but also an occasion for a vacation from other rules. Other temptations that have heretofore been under tenuous control can thrive using the period of the binge as an exception to the rules that forbid them, a holiday like Saturnalia. Modified rules like, "I will be faithful, respectful, and prudent, but not when the alcohol is talking," are supported by a reduction in the pressure of urges between binges, which may make up for the aftereffects of the periodic adultery, rage and/or dissipation, particularly if other people accept the attribution to the alcohol. The drunken and sober selves will take on a whole panoply of different characteristics, often under the general rubric of hero and villain.

The greater the scope of the rules threatened by the person's impulsive behaviors, the more necessary the blockage of memory to maintain his confidence in his will when sober-- that is, the more he will be motivated to use dissociation to further separate his lapse district from the rest of his life. Although a person may learn to accept a circumscribed weakness of will against a "normal" temptation like drinking, he might find that a disgusting paraphilia or outbursts of vicious rage at someone he loves require ignorance. A person who is vegetarian because of a

concern for world food supplies might not be threatened by episodes of eating meat, and might even recognize periodic occasions for it; but for one who is vegetarian out of a tenet that killing animals is murder, eating meat would threaten a larger belief structure, and he would be motivated to "not be himself" during any such episode. Dr. Jekyll could not accept Mr. Hyde, even as a lapse. A person with enough blockage will have a "split ego."

Thus some dissociations may be extreme forms of that spontaneous pressure valve, the lapse district. Just as a lapse district itself offers other impulses the occasion of a natural exception to rules, the concealment from these rules afforded by dissociation will further attract the other major addiction range interests that the person has tried to outlaw. Once an exception is thus doubly protected from the review of personal rules it must be a formidable focus for organizing other impulses. Thus dissociated selves are apt to become very bad citizens, but primary selves will be proportionately virtuous.

C. Dissociation may evade rules that serve sellout range interests. There is a more speculative possibility which sometimes appears in the lore of addictionology: that a person's will may have become so confining that a pattern of regular lapses actually makes him better off in the long run. This lore attributes bingeing to a patient's inhibitedness in the rest of his life; his general overcontrol is said to set up periodic episodes of breaking loose.

The model of intertemporal bargaining predicted by hyperbolic discount curves provides a specific rationale for this pattern: Ruling out any large source of emotional reward will create a proportional motive for the person to bypass or break his rules. If these rules have, in William James' phrase, "grown too narrow for the actual case" (1890, p. 209; side effect #2, above), even his long range interest will lie in partially escaping from them. Thus personal rules that serve sellout range interests potentially create alliances between long and short range interests. The person's occasional binge comes to serve as a correction to the comparative sterility of such rules, a means of providing richer experiences while still limiting the scope of behaviors that pay off in the addiction range. The longest range interest of an alcoholic who is too rigid when sober may be to tacitly foster the cycle of drunkenness and sobriety, rather than be continuously imprisoned by his rules.

An alcoholic is sometimes described who becomes nicer, or more genuinely creative, or more fully human when drunk. Furthermore, some addicts plan binges in advance. Such people may believe that their binges are undesirable-- indeed, "rationality" will almost certainly dictate such a belief-- but the therapists they hire find them mysteriously unresponsive to treatment. The patient who arranges for drinking several days in advance-- goes off his disulfiram, for instance, or brings bottles with him to his rehabilitation program for later use-- cannot simply be yielding to a short range impulse. This is behavioral evidence that he experiences his rational plans as sellouts which, even at a distance, appear to need hedging, although he may be unable to report any such thing.

Evasion of sellout-based rules is thus a third incentive for dissociation, beyond the avoidance of intrusive thoughts and the protection of useful personal rules.¹⁸ Insofar as this mechanism is important, a simplistic policy of "the more willpower, the better" will contradict the experience of many addicts. They are able to "listen to reason" only when they have somehow learned to ease the strictures that starve their own long range interests.

¹⁸ Of course, such evasion could also be said to be preserving these rules, in that it prevents their outright confrontation. The interest that supports the rules may also support their evasion.

Pervasive personal rules may arise in response not only to extraordinary temptation or ineptness in dealing with temptation, but also to an environment's extraordinary demands for systematic decision-making. As a society develops a complex, interdependent economy, it generates both better means for individuals to maximize their efficiency and more pressure to do so. Not that one has to obey particular people or otherwise narrow her choices-- on the contrary, the range of substitutable behaviors grows enormously. But a person who chooses these substitutions on a basis that ignores economic advantage loses conspicuous benefits.

Even as parents and rulers have less control, the logic of an increasingly comprehensive marketplace has more. The implications of a person's choices comes to extend beyond a set of related behaviors in a circumscribed context-- how to satisfy this customer, make love to this partner, fix this machine-- to most of her behaviors in a common universe, and the behaviors of many other people whom she may never meet. To list three of the many manifestations of this progression: Cash prices and wages, which make disparate decisions comparable, have penetrated choice-making ever more minutely, so that goods and services that used to be bartered as part of relationships are increasingly paid for. It is indicative that the smallest unit of money in use was half a day's wages in medieval times but is now barely worth picking up from the floor (ironically, the penny in both cases; Burnett, 1969). Similarly, the long-term records that result from one's behavior, which once consisted (beyond a few major documentations like births, marriages, and deeds) of the emotional memories of neighbors, are now automated, quantified, and increasingly collated. The consequence is greater comparability of past and current choices; a job report, credit rating, or traffic ticket that was issued a decade ago are increasingly available, and used to predict a person's behavior. Thirdly, formal acculturation by schooling is increasingly lengthy and increasingly audited according to standards. A person's performance in one subject or at one time can be compared to her performance elsewhere, or to another person's, with increasing precision, comparisons that are apt to determine her career choice, her advancement, or at least her morale. In these and many other ways, each of a person's choices is made comparable to, and thus predictive of, a range of other choices. Attention to this aspect of choice is rewarded by greater efficiency in any systemizable endeavor; but, as we have just discussed, it may lead to less productive occasioning of reward in the long run.

These changes do not feel forced upon us by alien interests. On the contrary, they are means to the ends we ourselves have defined, means that are increasingly selected for efficiency by the competition of the marketplace. We freely adapt our personal rules to be compatible with them; but these rules may come to serve sellout range interests.

Attuned as we are to modern efficiency in the developed world, we do not recognize the oppressiveness of an environment so rationalized that much of our natural ideosyncrasy has been anticipated and harnessed or selected out. But newcomers accustomed to more backward economies find our relationships superficial; and our own fictional heroes are increasingly those who rage against systems. The costs of basing decisions only on countable outcomes never appear in cost/benefit analyses; indeed they are recognized only obliquely, as anomie or other imponderable morale problems, part of the "X-inefficiency" of workers that somehow limits their responsiveness to monetary incentives (Leibenstein, 1976). Only in the last two decades has there been retrenchment where systemization is most advanced-- in large corporations-- in the form of decentralization, quality circles, self-directed work teams, and other retreats from the conventional approach of time/motion efficiency (Macdonald and Piggott, 1993).

The systemization of modern society may be making the evasion of personal rules an increasingly important motive for dissociation. Certainly the apparent increase in multiple personality disorder in modern times has been perplexing. The condition was known in Victorian times, and, as demonic possession, even earlier (Ellenberger, 1970, pp. 13-22). Granted that it has recently received a great deal of publicity; if there were a substantial incidence of it in earlier days one would expect there to have been more discussion of it. The supposed causative agent, trauma in childhood, must have been more widespread in earlier generations, an increase in reportage notwithstanding: Historical cultures encouraged physical discipline, neglected children's experiences (Aries, 1965), and had scant means or will to interfere with abusive families. The violence of the life children saw in earlier times is attested to by the cruelty of their games.¹⁹ If trauma were the main cause of dissociative disorder, we would expect the incidence to be decreasing, and this, at least, does not seem to be happening. The evasion of an increasingly systematic world is a speculative cause at best, but it makes some sense. Dissociation in such a cause would represent another alliance of convenience between addiction range and long range interests.

4. Summary

The strategy of controlling temporary preferences by perceiving one's choices as sets of precedents is far different from the rationality of exponential discounting envisioned by conventional utilitarians. Instead of being an elementary process, that rationality seems to be a legal fiction, a convention that has been shaped by practical experience to be the most useful goal of the intertemporal bargaining process. We undertake to make choices as if this goal represented our spontaneous preferences-- and perhaps even to suppress our awareness of this very undertaking. We do so to give our long range interests an advantage over shorter range interests, and to give ourselves an advantage over economic and social competitors where self-control is a factor in the competition. However, this rationality is a somewhat clumsy artifice, seemingly cobbled together in the form of personal rules without having evolved in lower species, as soon as the human race realized that our spontaneous preferences did not maximize our long range prospects.

I have described four side effects of personal rules that interact to produce two behavior patterns which we find pathological, patterns which in turn interact to stabilize each other. The four properties are:

1. Rigidity leading to legalism.
2. Magnification of lapses, leading to encapsulated symptoms.
3. Perceptual distortion, leading to limited self-knowledge.
4. Inordinate dependence on concrete criteria, which suborns personal rules away from the person's longest range interests.

The two pathological processes are addiction and dissociation. My analysis of their interaction uses the piceoeconomic concept of durations of temporary preferences; in particular, addictions (hours to days) and sellouts (months to years).

¹⁹ Torture of animals, for instance, is uncommon today compared with even recent times. If we go far enough back we encounter village games where children nailed a cat to a wall and took turns trying to butt it to death with their heads (Origo, 1959, pp. 40-43).

The artificiality of personal rules (side effect #1), may make them seem like prisons. Formation of lapse districts (side effect #2) leads to stable behavioral "symptoms" with an addiction range of preference. Distortion of perception (side effect #3) may both conceal and strengthen lapse districts. The selective advantage which rules with concrete criteria have over those without (side effect #4), often leads to the dominance of rules that serve sellout range interests, an effect that enhances the sense of imprisonment. When a personal rule no longer serves a person's longest range interest, lapse districts that have broken away from this rule may ironically start to serve this interest, forming an alliance that can explain why some addictions are highly resistant to therapy.

For these reasons, two incentives for dissociation-- the protection of desirable personal rules and the evasion of the personal rules that serve sellout range interests-- may well be added to the conventional one of avoiding intrusive thoughts. Incidentally, fantasy-proneness may be added to traumatic memories as a source of such thoughts.

Neither addiction nor dissociation represent the straightforward functioning of an elementary principle; rather hyperbolic discount curves can be expected to create them semi-stably in the course of intertemporal bargaining. Significant clinical addictions will usually occupy lapse districts-- areas which the will has stabilized by its failures-- and these addictions may ally with other addiction range interests and even long range interests. Likewise, dissociation has other motives besides the management of traumatic memories.

As theories of this complex subject proliferate, a unifying discipline will be indispensable: that of specifying how each tenet explains robust contradictory behaviors within the constraint of maximizing expected utility. This discipline seems attainable if and only if we understand the discount curves from expected rewards to be hyperbolic.

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