Self-Control Based on Soft Commitment

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Abstract Complex ambivalence refers to situations in which high-valued temporally extended and abstract patterns of acts (such as healthy behavior) are opposed to high-valued particular acts (such as smoking a cigarette). In such situations, a self-controlled act differs from an impulsive act not by virtue of the source of control (inside versus outside the organism) but by virtue of the temporal extent of the contingencies controlling the behavior (extended versus constricted contingencies). Soft commitment is another name for patterning behavior over time so that it may come into contact with temporally distant or extended contingencies. Behavioral methods of establishing self-control typically target particular impulsive acts. The present article suggests that self-control in situations of complex ambivalence also may be achieved by focusing not on reducing the impulsive act itself but on the establishment of patterns (soft commitment) so that behavior comes into contact with the extended contingencies. As an illustration of how this may be accomplished, a specific self-control program is outlined for smoking.

Keywords Complex ambivalence · Patterns of behavior · Self-control · Simple ambivalence · Soft commitment · Smoking

Behaviorists understand that all voluntary acts, including behavior we label as “self-controlled,” are controlled, ultimately, by contingencies of reinforcement—contingencies between acts of the organism and consequences of those acts. When the presence of those contingencies is consistently signaled, and discriminative responding is established, the signals are said to gain control of the behavior. Traffic lights signal a relationship between driving and accidents or fines, so our stopping and going in a car is said to be controlled by the lights. The phrase, “self-control,” is a misnomer. The difference between self-controlled behavior and impulsive behavior is not that self-control comes from the inside, and impulsiveness from the outside of the organism.

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Rather, when behavior is said to be self-controlled, the contingencies that control behavior are temporally extended; when behavior is impulsive, the contingencies that control behavior are temporally constricted. Thus, the words “self-control” and “impulsiveness” do not refer to two different sources of behavioral control (from inside and from outside the organism); rather, these two words mark relative positions on a continuum from control by immediate contingencies to control by long-term and abstract contingencies. When a dieter eats a second dessert, it is because his behavior is under the control of temporally narrow and particular contingencies—the reinforcer is high in value and occurs immediately but lasts a short time. When a dieter refuses a second dessert, he does not refuse it because some internal force of will is telling him to do so but because his behavior is under control of social approval, health, or some other temporally extended and abstract set of events. The object of a self-control program therefore should be to establish control of behavior by its widest possible temporal consequences (Rachlin 1974, 2000).

Current behavioral self-control treatments, such as contingency management, are focused directly on the behavior to be controlled. Smoking or alcoholic drinking, for example, may be extrinsically punished; cigarette or drink refusal may be extrinsically reinforced. Or, other high-valued but less harmful reinforcers (such as nicotine patches) may be substituted for the target behavior (Higgins & Petry, 1999). The object in these cases is to use short-term reinforcers or punishers, as a scaffold of sorts, to bring behavior under control of natural or social long-term contingencies; then, when the scaffold is removed, the long-term reinforcers serve to maintain the desired long-term pattern. These procedures have been successful in the long term as well as the short term.

The present article proposes a method based on soft commitment to shape a highly valued long-term behavior pattern (for example, exercising regularly for a year) even though individual acts that compose the pattern (exercising today) may be negatively valued.¹

Hard Commitment Consider the lament of Archie Goodwin (Nero Wolfe’s sidekick in Rex Stout’s series of detective stories): “The trouble with an alarm clock is that what seems sensible when you set it seems absurd when it goes off” (from *The Rodeo Murders*). Goodwin’s lament exemplifies simple ambivalence—*simple*, because there are clearly-predictable time periods when he prefers one alternative (waking up early) and when he prefers the other (staying in bed). The alarm clock is a *hard-commitment* device. At midnight, it “seems sensible” to Goodwin to sleep 7 h, get up at 7 a.m., and put in a full day of legwork for his boss, Nero Wolfe. But when the alarm goes off the next morning, the remainder of the patterns between which he had chosen the night before have suddenly reversed in value. What was chosen before is now rejected, and what was rejected before is now chosen. At this point, when the alarm rings, the choice Goodwin made last night “seems absurd.”

¹ The positive value of an act is defined for present purposes as the price a person would pay or the reward she would forgo for the opportunity to perform the act. The negative value of an act is defined as the price a person would pay or the reward she would forgo to avoid performing the act. The value of a pattern of acts, positive or negative, is the whole pattern’s value, which may be unrelated to the values of its component parts.

Having set the alarm clock the night before (and assuming he put it across the room so he has to get out of bed to turn it off) allows Goodwin to choose again the next morning whether to get up or to go back to sleep. But there are few instances in everyday life where preferences change so quickly and completely. And there are few devices like alarm clocks by which to commit to earlier (and, ultimately, more sensible) preferences. Much more common is the dilemma of the dieter, always wanting to lose weight (with the promise of improved health and social acceptance) and, at the same time, always liking to have something to eat.

Soft Commitment When Goodwin sets his alarm clock at midnight for 7 a.m., sleeping late the next morning is of low value for him. There is a point in time (midnight) when he prefers what is in his long-term best interest. At that point, he activates a hard-commitment device. But for the dieter, there exists no such point; the dieter is always tempted. He or she is never free of the desire for food except perhaps for a brief period after a binge. The dieter is continuously beset by ambivalence, eating for a period and abstaining for a period but, even when abstaining, being tempted to eat. This pattern is *complex ambivalence*. It is unlike simple ambivalence because it is not easily avoided with hard-commitment devices.

The contrast between good health and social acceptance on the one hand and eating a whole pint of ice cream on the other hand is that of a temporally extended event to a temporally discrete event—of an abstract pattern of behavior to a particular act.

To see the relation of abstract, temporally extended patterns of behavior to particular acts, imagine a snippet of film that shows a man swinging a hammer. But what is he *actually* doing? Now consider the following alternative descriptions. He is:

- a. Swinging a hammer
- b. Hammering a nail
- c. Joining one piece of wood to another
- d. Building a floor
- e. Building a house
- f. Providing shelter for his family
- g. Supporting his family
- h. Being a good husband and father
- i. Being a good person

All may be valid descriptions of his behavior. Based on the snippet of film, all one can say is that the man is swinging the hammer. He might have been swinging it at someone's head. But if one said, "He's just swinging the hammer," someone else who saw more of the film might say, "Yes, he's doing that, but what he's *really* doing is hammering a nail." A third person, who has seen still more of the film, might then correct the second in a similar way: "Yes, he's hammering a nail, but what he's *really* doing is building a floor." And so forth until there is a Godlike observer who has sat through a film of virtually the man's entire life and can make the final judgment: "He's being a good person."

The important point is that all of the descriptions, running from top to bottom, are descriptions of the man's behavior. As one goes down the list, more and more context (more responses, larger time frames, and more situations) is incorporated into the

description. But that context is always behavioral. The final Godlike observer need not look into the man's heart or head as long as she has looked at the complete film of the man's life. Then, the observer can say: "He is a good man" without fear of contradiction and regardless of the state of the man's brain or heart. The validity of any description may be settled by moving the camera back or showing more film so as to capture earlier and later events.

Some behavioral patterns are difficult to interrupt. Consider the act of listening to a 3-min song. People typically do not like to be interrupted in that act, and the closer to the end of the song, the more unpleasant interruption becomes. That is, as a person gets absorbed in a TV program, a play or a concert, interruption becomes more costly. Because long-duration activities attain their value by virtue of their organization (their pattern), interrupting them degrades the value of the whole and not just the value of the part during and after the point of interruption. If the film breaks during the 95th minute of a 100-min suspense movie, and the rest of the movie is cancelled, it is fair to say the viewer would not be 95 % as happy as when the film did not break.

When there is a pattern of behavior, and its interruption is costly (in the sense that a person would pay some price or forgo some reward not to have it interrupted), a person may be thought of as "committed" to its completion. This is *soft commitment*—*soft* because there is a way out. That is, the pattern is interruptible. But it is also commitment, because its interruption is costly. For example, a pair of baseball teams might agree to call off a game if it started to rain in the first inning, but not in the ninth inning. The longer the game lasts, the more committed the players are to finishing it, and the greater the price they would pay (in terms of discomfort) to finish it. More extended patterns may also have a structure that is costly to break. The author currently swims 3–5 times per week in the morning. On any given morning, especially in the winter, he would rather not swim than swim. However, he pays \$500.00 for his gym membership, and on vacation, he chooses hotels with swimming pools even though they may be more expensive than those without them. I am truly committed to my pattern of swimming; I would pay a price to avoid breaking the pattern and have done so on numerous occasions. But my commitment is soft in the sense that I can accept the cost and break the pattern at any point.

This is not to say that soft commitment always results in high-valued, long-term patterns. Compulsive behavior is an example of low-valued extended patterns. Ainslie (2001) views compulsive behavior as essentially an extreme and counterproductive form of self-control. Economists call commitment to behavior patterns for their own sake, "sunk costs." For example, a person may hold onto a particular stock longer than she should simply because she has already bought the stock. Nevertheless, while soft commitment may be abused, it is the main vehicle by which we humans bring our behavior under control of its long-term and abstractly conceived consequences.

The familiar patterns of response exhibited by organisms on various reinforcement schedules (Ferster and Skinner 1957) are examples of soft commitment. Siegel and Rachlin (1995) found that pigeons, with a very strong preference for a smaller-sooner reinforcer (SS) over a larger-later reinforcer (LL), would nevertheless choose the larger reinforcer if the alternatives were fixed-ratio schedules of 30 pecks (FR30) leading to SS or LL. The pigeons chose the pattern: 30 pecks followed by LL over the pattern: 30 pecks followed by SS (despite the fact that they could switch from the LL to the SS key at any point in the ratio including at the very last peck). The persistence of the pigeons'

pecking the LL key increased directly with the number of pecks required to obtain reinforcement (the FR number). Aside from the cost of losing the ultimately larger reinforcer, a changeover is costly in the sense that it requires more time than another peck on the same key, and also that it breaks up a strongly practiced, perhaps innate, fixed pattern (think of stopping a cough or sneeze). Like the baseball teams, the pigeons' tendency to complete the pattern they had begun increased as they progressed further into it. But, like the baseball teams, their commitment was "soft" since they could have broken the pattern (and on occasion did so).

How does soft commitment apply to human self-control? Much human behavior, especially behavior reinforced by distant or temporally extended consequences, is under the control of verbal rules. Sometimes, obedience to these rules is socially reinforced and remains so throughout our lifetimes—as in the case of many laws of the state. Sometimes, the rules are socially reinforced early in life (e.g., wear your muffler on cold days.) but maintained later in life by non-social consequences. As adults, we often bring our behavior under control of a verbal rule that some authority says will be good for us. Then, our rule-following behavior (such as my swimming) is maintained by its immediate or extended social or non-social consequences, or it is extinguished. The application of soft-commitment to self-control, "pattern-setting," is of this latter kind. Consider the person who keeps a supply of chocolate fudge bars in the freezer and is in the habit of eating one or two of them every night. Or consider the person who is in the habit of having two or three glasses of scotch every night before going to sleep. Suppose that person's behavior becomes controlled by the following verbal rule: However many fudge bars (or scotches) I have tonight, I will have an equal number each night for the rest of the week. Without the rule's adoption, each fudge bar (or scotch) consumed tonight would entail only its own consequences and could be, in theory, the last one ever consumed. With the rule's adoption, each fudge bar or scotch is, in effect, 7 of them strung out over a week. No longer is it possible to say, "Just this once." The value of consumption is no longer restricted to the moment but extended in time. In other words, eating the fudge bar or drinking the scotch has been given weight.

Pattern Setting Pattern setting [similar to Ainslie (2001) concept, "bundling"] is a soft commitment procedure aimed not at reducing particular undesired behaviors, but at grouping those behaviors together by means of soft-commitment. Once they are grouped together, the group as a whole will have a negative value as Fig. 1 illustrates.²

Discount functions for money and for many commodities have an asymptote at zero (Odum 2011). For example, the value of \$1,000 decreases hyperbolically as the delay to receipt of the \$1,000 increases. At delays of 100 years or more, the value of the \$1,000 is virtually zero. That is, a person might prefer as little as \$5 or even \$1 today to \$1,000 100 years from now. The same is true for many commodities—toasters, apples, automobiles, etc. However, for addictive commodities, the asymptote may very well be negative. Discount functions of cigarette smokers for money are steeper than those of non-cigarette smokers, and discount functions of cigarette smokers for cigarettes are

² The equation used to draw Fig. 1 is as follows: $v = (V + akD) / (1 + kD)$ where v = discounted value of the reward, V = undiscounted value, D = delay, k = a discount constant measuring steepness, and a is the asymptote of the function as D increases indefinitely. In the figure, $V = 10$, $k = 4$, and $a = -5$. Note that when $D = 0$, $v = V$; as D increases indefinitely, v approaches -5 . When $a = 0$, that is, when the asymptote is zero, the discount function is Mazur (1987) function typically shown to fit discounting data: $v = V / (1 + kD)$.

Fig. 1 The positive present value of smoking the n^{th} cigarette today (Monday) and the negative present value of the n^{th} cigarette on subsequent days (Tuesday through Sunday). The high positive value of the immediate consumption of the n^{th} cigarette today may be lowered or made negative by the subtraction of the currently aversive discounted future consumption contingent on today's high-valued act of consumption

steeper still (see Yi et al. 2010, for a summary of these results). As typically measured, these functions all have asymptotes at zero value. The measurement system itself constrains the discounted value to positive numbers. It may be that discount functions for addictive substances of some addicts, especially those who do not want to be addicts, have negative asymptotes. For example, alcoholics or heroin or cocaine addicts (who can afford it) will pay large sums to enter sanitariums whose main feature is the unavailability of the addictive substance. However, those same addicts will also pay for one last drink or one last hit before they enter. Dieters will pay to go to camps where their food intake is limited. The same dieters will overeat on the day before going to camp. In all of these cases, the present value of the addictive activity is highly positive, but the future value of that activity is negative. In the words of Saint Augustine, “Lord make me chaste, but not yet.” To put it prosaically, Augustine values sexual activity positively now but negatively in the future. Figure 1 takes a corresponding change of valence to be characteristic of smokers who desire to quit.

Jane wants to stop smoking. That is, she wants to smoke zero cigarettes per day. She nevertheless values smoking each particular cigarette so highly that this value overcomes the negative value to her of smoking in general. Ordinarily, she always wants to smoke a particular cigarette right now. Let us say that this particular cigarette is her 20th of the day. Its immediate value is very high—as the upward pointing arrow at day-0 shows—so high as to overwhelm her expressed desire to stop. But the value of the 20th cigarette (like the value of all particular rewards) declines hyperbolically with time (Mazur 1987). In Jane's case, however, the asymptote is negative. Jane prefers not to smoke 20 cigarettes per day on future days. Tomorrow's 20th cigarette (at day-1 in Fig. 1) is worth nothing at all to her, and the present (discounted) value of the 20th cigarette on future days becomes more and more negative to Jane as that particular cigarette grows more distant in the future. She does not want to smoke 20 cigarettes on future days. She wants to smoke none. It is just that this particular one is valued so highly that she cannot resist it. And the same is true about every other particular

cigarette she smokes. However, if today's positively valued n^{th} cigarette is bundled with the discounted below-zero values of future days' n^{th} cigarettes, the positive value of the former may quickly be counterbalanced by the negative value of the latter. As the weight of the future bundled cigarettes subtracts more and more from that of today's particular cigarette, the value of the bundle becomes negative, and more negative as the number of days in the bundle increases.

The purpose of the pattern-setting program, therefore, is to entrain each subsequent daily n^{th} cigarette so it is clearly and repeatedly contingent on smoking today's n^{th} cigarette. Initially, in the program, only tomorrow's n^{th} cigarette is contingent on today's, but as the program proceeds, Jane adds more and more days on which she will have to smoke an n^{th} cigarette (if she smokes one today), until the negative values of the particular, entrained, n^{th} cigarettes subtract enough from today's high value to bring it down into negativity for her. *At that point, she will not want to smoke the cigarette today.*

This reasoning makes several assumptions. First, that the current value of future cigarettes is negative; second, that the negative current values of future cigarettes add up to a magnitude sufficient to counteract the strong positive value of current consumption; third, that the soft commitment involved in maintaining the pattern is strong enough to overcome everyday distractions. However, it is important to note that the effort involved is not an effort to reduce smoking but an effort to maintain the pattern. If the pattern was maintained, and the above assumptions hold, the value of smoking would be negative. That is, Jane would just not feel like smoking on her free day.

A Pattern-Setting Program What is the practical advantage of looking at self-control in this unusual way? To show how this viewpoint may have practical implications, the following untested self-control program based on pattern setting is proposed. It may or may not actually work, but the reader may better understand the principles involved through a practical example than by abstract argument. The object of the program is to establish self-control, not by changing anything inside the person or even by rewarding or punishing any particular act. The object rather is to widen patterns of the target behavior, thereby to bring particular acts under control of the intrinsic negative value of those patterns.

Stage 1: Training in self-monitoring. For pattern setting to work, it must be imposed on top of already-established self-monitoring. Self-monitoring is so important to pattern setting, and so difficult, that it should not be mixed up with actual efforts at habit change. At no point in pattern setting would a person be *trying* to change his own behavior. Pattern setting, if it works, should work automatically. But, while learning to keep records of one's own behavior, it is especially important that an individual *not* be trying to change the target habit.

Stage 2: Alternation of free days and matching days: After a smoker has gained self-observational skill, she is ready to proceed to pattern setting per se. For example, Jane's problem was that each particular cigarette weighed too little, so to speak. How could Jane have given her cigarette more weight? How could she have made smoking it less like a feather and more like a bird (as the poet Valéry advised)? Let us say that Jane has already learned to monitor her own behavior and is recording each cigarette smoked and the time it was smoked (Note that this

already adds to the cigarette's weight. It does not just go up in smoke but is preserved in her log). Now, pattern setting is applied. Free days (F) alternate with matching days (M). The first day is a free day:

Free day: Jane smokes as many cigarettes as she feels like smoking all the while recording how many cigarettes she smokes that day.

The second day is a matching day:

Matching day: Jane smokes exactly the number of cigarettes as she did on the previous free day.

On that first free day, Jane smokes as much as she wants to. She makes no effort to restrict her smoking in any way. In fact, at no point in pattern setting would she be trying to smoke less. However, on each matching day, she must smoke exactly the same number of cigarettes as she did on the day before. If she falls short, she must sit up an extra hour to smoke those two or three cigarettes to make up the total. Then, on the next day, she is free again, and on the following day, she has to mimic yesterday's total always continuing to monitor her smoking. Now, when she lights a cigarette on a free day, she is in effect lighting up two cigarettes—one for that day, and one for the next, matching, day. As she keeps to this schedule, her behavior should be forming itself into wider patterns. Jane continues to alternate free and matching days for, let us say, 3 rounds of fixed and matching days (FM-FM-FM) totaling 6 days. It may be that at this stage, she is smoking as much as or even more than she was when she started (The sum of the values at day-0 and day-1 in Fig. 1 is greater than zero, as it is in the figure). So be it.

Stage 3: Expansion of patterns: Now, each free day is followed by 2 matching days, again for 3 rounds (FMM-FMM-FMM) totaling 9 more days. Then, each free day is followed by 3 matching days (FMMM-FMMM-FMMM) totaling 12 more days. Then, 4 matching days, etc.—each for 3 rounds. This continues until 6 matching days (FMMMMMM-FMMMMMM-FMMMMMM) and continues with this pattern for the duration of the program (minimum of 3 rounds). Now, Jane is smoking the same number of cigarettes each day of the week as she did on day-1, the free day. At this point, smoking a cigarette will have lost its particularity and become part of a pattern. “Just this once” will no longer be an excuse to smoke. The weight of each particular cigarette will have increased; Jane no longer can say, “This particular cigarette won’t kill me.” [It is true that, at the margin, smoking 7 cigarettes over 7 days will not kill her either, but neither will the 7 cigarettes have the immediate appeal of a single one.] With this program, the number of cigarettes smoked on any day is never set by another person; they are always set by Jane. And Jane sets these patterns not by her verbal behavior but by the target behavior itself.³

³ To make the patterns fit better into weekly schedules, they might be imposed as follows (all sequences starting on Mondays): First 2 weeks: FMFMFM each week. Third and fourth week: FMMFMMM each week. Fifth week to end of program: FMMMMMM each week.

Stage 4: Relapse: What if, at any point, Jane does not stick to the rigid pattern of identical number of cigarettes on fixed days to the free day? In that case, the very “fixed” day on which she failed to match the prior free day (whether by smoking more or fewer cigarettes) becomes a free day, and Jane starts over again at whatever particular sequence of fixed days she was in. Let us say that the point where she broke the pattern was the 3rd day of the FMMMM round. Then, that 3rd day becomes a free day, and she goes through that round again before proceeding. She needs only to complete 3 rounds without relapse at any given point. As in any self-control program, relapses will be frequent. Monitoring, because it is so difficult (and, you might add, difficult because effective), may fall away. At this point, Jane must first reestablish strict monitoring before continuing with the program.

Most importantly, there is never a requirement that Jane reduces the number of cigarettes she smokes on any day, only that she keeps to the pattern. Even if she breaks the pattern, all that happens is that her progress through the sequence (of more and more fixed days following a free day) is slowed down. It may appear as if pattern setting is just too easy to break. No hard commitment locks the smoker into matching on matching days. What is to prevent her from breaking the pattern and impulsively smoking more (or fewer) cigarettes than on the free day? The answer is that nothing in the program prevents the smoker from doing this. If the pattern is broken, the matching day becomes a free day, and the sequence starts anew. Remember, on the free day, the smoker smokes just as many cigarettes as she feels like smoking on that day. If she does that, she is unlikely to develop strong cravings the next day when she smokes just as much as she did yesterday. Again, the only thing the smoker is trying to do is to match the free days on the matching days. If she truly smokes as much as she wants to on the free days, this should not be difficult to do. If the program is working, smoking reduction should occur automatically and effortlessly as the negative value of future smoking gains control of her free-day behavior.

That is basically all there is to pattern setting. It may be applied in other self-control situations such as eating disorders or addictions of various kinds (as long as there are particular instances that may be counted or timed; in the case of students not studying or writers not writing activities would be timed). It is no panacea. It would not be expected to work in isolation from the rest of a person's life. Regardless of how effective any technique may be, any self-control method has to be regarded in the context of a complete life. Both social support and exercise, for example, are economic substitutes for addictions of various kinds (Fisher, 1999). If either is lacking, programs (such as Alcoholics Anonymous) should be established for their institution. However, once such a framework is established, pattern setting may allow extended contingencies to gain control over problem behaviors and ameliorate dysfunctional patterns. Of course a fixed daily total over a week is not the very pattern that will eventually constitute control of smoking. However, a week is far longer than the moment-by-moment pattern typical of smokers; if the relative weights assigned to future days in Fig. 1 are even remotely realistic, smokers will not want to smoke. Over time, the patterns generated by pattern setting may be expected to engage those still wider, more abstract patterns that constitute human happiness.

Compliance with Ethical Standards

Ethical Approval This article does not contain any studies with human participants or animals by any of the authors.

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