It is by refraining from pleasures that we become temperate, and it is when we have become temperate that we are most able to abstain from our pleasures. —Aristotle, *The Nicomachean Ethics*

Prudent, cautious self-control
Is wisdom’s root.
—Robert Burns

... the man who has daily injured himself to habits of concentrated attention, energetic volition, and self-denial in unnecessary things ... will stand like a tower when everything rocks around him, and his softer fellow-mortals are winnowed like chaff in the blast.
—William James, *The Laws of Habit*

And the Lord God commanded the man, saying, Of every tree in the garden thou mayest freely eat: But of the tree of the knowledge of good and evil, thou shalt not eat of it: for in the day that thou eatest thereof thou shalt surely die.

The human capacity for self-control has been an enduring theme in philosophy, poetry, politics, and theology throughout history. It could even be argued that self-regulation is the oldest psychological question: The basic battle of self-control over impulses can be found in the biblical account of Adam and Eve in which God tells Adam he is free to engage in all behaviors, save one. Indeed, God makes it clear that this test has the most dire of consequences (i.e., death) and yet Adam eats the forbidden fruit, forever condemning humankind to the struggle between good and evil. Philosophers have labored through the ages to reconcile the logical conundrums created by radical arguments for either free will or determinism. Hence, it would be supreme arrogance to imagine that any single contemporary theory could capture all the complexities of self-control. Our goals were much more modest; we were interested in trying to identify and explicate the situational, individual, and intrapsychic conditions responsible for failures of self-regulation.

We arrived at our interests in the issues of self-control from different directions. One of us came from traditional social psychology and had focused on issues related to self-presentation, self-esteem, and self-regulation of performance, thought, and emotion; the other came from studying behavioral self-regulation, especially in the domains of human eating and smoking. During our early discussions we realized there was an extraordinary overlap in the conditions that produced self-regulatory difficulties across these broad categories of behavior. Indeed, our initial work together involved applying a novel social–psychological theory (escape from self-awareness; Baumeister, 1991) to account for binge eating behavior, which had been traditionally explained in terms of psychobiological factors, individual differences, or psychodynamic forces (Heatherton & Baumeister, 1991). As we sought to understand the potential conditions that led to self-regulation failure, we found sufficient consistency to convince us that we could derive an interpretative structure that could assist us not only in determining what we knew, but also what we did not know about how and why self-regulation failed.

We spent the better part of five years reviewing the literature in diverse areas to see how well our organization worked and how well our proposed mechanisms were supported. The book that resulted from our efforts (Baumeister, Heatherton, & Tice, 1994) contains the full description of our integrative structure and also contains more than 700 references to the empirical literature. Our brief review, that was subject of the commentaries, covered the major features of our syn-
thesis and raised some of the more interesting unresolved questions. It has been instructive to consider the many excellent commentaries on our review. We argued in our target article and in the book that psychologists have focused more on how people regulate behavior than on how they fail in those attempts. However, the commentaries were nearly unanimous in identifying self-regulatory failures as essential aspects or extensions of the authors' own theories and one cannot avoid the impression that we infringed on some vigorously defended turf. Nonetheless, to paraphrase Bob Kleck (personal communication, June 1, 1995), isn't it nice that we are all working on the same thing?

One thing that becomes clear from reading these commentaries is that it would be useful to have an updated, comprehensive, and viable general theory of self-regulation. Many commentators point out that our various comments about self-regulation failure would be more useful or meaningful if placed in the context of such a theory. We agree. In fact, we originally set out to construct such an updated general theory of self-regulation. We gradually realized, however, that the field and the empirical literature are not yet ripe for the next generation of such theory, for many reasons, including the current and sweeping shifts in thinking about the distinction between automatic and controlled processes (which is likely to figure prominently in the next general theory of self-regulation). We therefore had to content ourselves with trying to provide one helpful resource for whoever produces that next general theory. Yes, it would have helped to have a full theory of self-regulation before discussing how self-regulation fails—but then again a good understanding of how self-regulation fails can be quite valuable for the construction of such theory. In this, our approach follows a time-honored tradition in psychology (e.g., learning about how the brain functions by studying people who have brain damage, learning about sanity by studying neurotics, or learning about memory by studying what people forget).

In our response to the commentaries, we briefly summarize the major issues, concerns, and questions raised by the reviewers and in doing so we hope to clarify the essential features of our model. We also speculate about the important questions and issues that remain unresolved in understanding self-regulation failure.

The Major Issues

Having people evaluate your theoretical approach to a complex issue based on a brief journal target article is rather like having people evaluate your wardrobe based on what you wear to a formal dinner. Your formal attire may represent the finest aspects of your wardrobe but it probably does not fit quite as well as it should and it may even misrepresent your general fashion. Moreover, some important—yet less visible—aspects of your ensemble may be overwhelmed by the glare of the most visible pieces. It may be best if we undress our theory down to its essentials and then display it in its more modest working clothes.

Definitions

An important contribution of our target article and the commentaries is to highlight the diverse ways that people use the term self-regulation. For instance, some of the commentaries refer to volitional processes (Kuhl, Pervin, Shapiro, some to reinforcement processes (Ainslie, Logue, Tomie), others to biological processes or cultural processes (Berkowitz, Zucker & Ichiyama), and some to social–cognitive processes (Carver & Scheier, Cervone, Smart & Wegner), whereas other commentators focus more on specific domains, such as goal conflict (King, Polivy) or self-efficacy (Bandura). Herman raises the most basic issue of whether the term self-regulation refers to regulation of the self or by the self. Block sees multiple ambiguities in the overuse of the term self by psychologists. Like Herman, we believe that the self is more than the composite of behaviors, thoughts, and feelings. At the same time, those aspects of self that are prone to regulation are almost invariably behaviors, thoughts, and feelings. More stable aspects of self, such as identity, may be less relevant to issues of self-regulation (other than by contributing to goals and standards). Thus, self-regulation and self-regulation failure should be limited to those aspects of self that are malleable.

In general, self-regulation refers to the process by which people initiate, adjust, interrupt, terminate, or otherwise alter actions to promote attainment of personal goals, plans, or standards (Baumeister, Heatherton, & Tice, 1993; Baumeister et al., 1994; Heatherton & Ambady, 1993; Scheier & Carver, 1988). At the broadest level, self-regulation involves any effort on the part of an agent to alter its own responses (Baumeister et al., 1994). Thus, self-regulation refers to intentional or purposeful acts that are directed from within the person (Bandura, 1989; Carver & Scheier, 1992). From this perspective, learning, physiology, and culture predispose certain behaviors in specific circumstances; self-regulation occurs when people override, alter, or inhibit those naturally occurring behaviors. Ainslie's description of a canoeist navigating white water strikes us as particularly apt. Although the normal flow of the water would direct the canoeist in a specific direction (and at a specific speed), self-regulation oc-
curs when the canoest acts to alter the course or even decides to get out of the water. Our view of self-regulation is based primarily within a social–cognitive framework (as was pointed out by some of the commentators) and therefore emphasizes goals, plans, and personal beliefs over situational contingencies and reinforcers, physiological processes, and unconscious psychodynamic motives. Although we are not downplaying the important contributions of learning and physiology to understanding behavior, our model is more concerned with the cognitive and affective determinants of behavior. More specifically, our model is concerned with how and why attempts to initiate, adjust, or inhibit purposeful or intentional actions succeed or fail.

Developing a workable definition for self-regulation failure is quite challenging. As was pointed out by many of the commentaries (and a point that was made explicitly in our book), whether one considers a regulatory effort a success or a failure depends on one’s perspective. For instance, when there are multiple and conflicting goals, success in one domain may necessitate failure in another (indeed, any delay of gratification can be considered a failure to satisfy the immediate hedonistic goal) and similarly, many behaviors that may look like self-regulation failure may actually be nothing of the sort (e.g., excessive drinking by those not trying to control alcohol intake). Polivy even argues that apparent self-regulatory failures may in some cases produce better goal attainment than does self-regulatory success (see also Carver & Scheier). Whether one considers self-regulation a success or a failure hinges on the purpose of the regulatory effort itself. In our view, self-regulation failure refers to problems that arise when one intentionally tries to initiate, alter, or inhibit a specific response or behavior and fails to do so because one does not put in sufficient effort (underregulation) or because one’s active efforts are ineffective or counterproductive (misregulation). In any case, the definitional questions are probably confined to semantic niceties and a few ambiguous cases; most people know well enough when they have failed at self-control.

People set goals and try to achieve them. Successful self-regulation occurs when people purposefully engage in behaviors (and make ongoing adjustments in their behavior) that lead toward successful attainment of those goals. On the other hand, self-regulation failure occurs when people either fail to engage in a behavior that would bring about attainment of the goal or they engage in behaviors that are either ineffective or that actually move them farther from their goals. Note that this refers to self-regulation of behavior with reference to a specific goal. We use the term self-management to refer to the simultaneous self-regulation of multiple and contradictory goals. In this regard, we note that there are a number of possible models that can be used to understand the relation between conflicting goals (see the discussion by King). For instance, the hierarchical model used by Carver and Scheier (1981) predicts which goals are superordinate at any one time (see also Vallacher & Wegner, 1987).

**Underregulation and Misregulation**

As some of the commentators pointed out, the distinction between underregulation and misregulation is not new in psychology, although there remains considerable disagreement about the usefulness of the dichotomy (Block). Herman points out that it is often difficult to tell whether an action represents misregulation or underregulation. For instance, Herman has long argued—along with his colleagues—that dieting problems are a form of misregulation (i.e., they argue that dieting in almost any form is inappropriate), whereas most of society views the major problem with dieting as underregulation (i.e., that people do not diet hard enough). However, this is the view from the outside (i.e., the researchers or the public) rather than the view from the inside (the person trying to regulate behavior). The issue is not whether the outside observer can declare the behavior worthy of effort, but rather it depends on the actor’s personal goals, standards, and beliefs. Underregulation refers to failing to take action, whereas misregulation refers to taking action but taking the wrong action. For the person who is dieting in an attempt to lose weight (a goal that we agree is probably destined for failure in the long run), underregulation refers to not trying to control food intake, whereas misregulation refers to misguided or counterproductive strategies—for example, eating a food because it is low fat, while ignoring the fact that low fat does not equal low calories. (One of us recently saw an ad for low-fat brownies that provided over 500 calories per serving—a veritable misregulated dieter’s delight.) Drinking a great deal of alcohol is only self-regulation failure for the person trying to control intake; college students who purposefully drink a great deal may actually be almost too efficient in their self-regulatory skills, which raises the issue of whether self-regulation can ever be excessive.

Ainslie and others point out that psychological clinics are full of those who engage in apparent overregulation (e.g., anorexic patients, misers, and workaholics). Our view is that there is no such thing as overregulation. The problem is not that these people have self-regulatory deficiencies, it is that they are trying to achieve unobtainable goals or are using inef-
icient methods. Thus, we view apparent problems of overregulation as a category of misregulation. For most people, becoming more weak-willed, trying less, or using bad strategies will not solve their regulatory problems. Rather, they may need to focus on more realistic goals.

A good analogy would be the case of a successful manager. By definition, a successful manager uses resources wisely. Overmanagement occurs when the manager fails to delegate authority and tries to make all of the decisions personally. This person spreads himself or herself too thin and the company’s performance suffers. The problem is not with the capacity or ability to take control and make decisions (in that the capacity for self-control is always good) but with the strategy for enacting that control. This is where we diverge from Bandura’s view that self-efficacy is always a good thing. We have argued (Baumeister et al., 1993; Heatherton & Ambady, 1993) that high self-efficacy may actually impede self-regulation in certain situations. Consider one example: People who are highly confident that they can lose weight or quit smoking may be less likely to worry about breaking their diets or smoking cigarettes because they are certain they could lose weight or quit smoking again in the future. Thus, although high self-efficacy may promote successful weight-loss or smoking cessation, it may also promote increased relapse. For those with high self-efficacy, self-regulatory failures may be more closely linked to misregulation than to underregulation.

Misregulation refers to actions that are counterproductive or inefficient for bringing about specific goals. Both Polivy and King note that goal conflict may produce behaviors that only appear to be self-regulation failures. For instance, Polivy argues that indulging a whim to mask a more long-term problem may be an effective means of coping with that problem. Thus, people who eat ice-cream sundaes or go shopping when they are upset about major problems may be sacrificing self-control to regulate their emotional state. Again, we explicitly categorized this as misregulation, at least with reference to the self-regulation of eating or shopping. (Indeed, such an act is an excellent example of the pattern we described of giving priority to regulating emotions at the expense of other spheres of self-regulation.) Whether this is a propitious choice depends on the costs of the behavioral misregulation; people who go bankrupt or become fat trying to cope with stress are surely not improved by their self-regulatory failures. On the other hand, for most people the occasional indulgence may be a treat rather than a catastrophe and if it soothes the mood while undermining the diet it can be an acceptable trade-off.

We hasten to add that we do not believe that people should always forsake immediate temptations for the sake of long-term distal goals. Spontaneous actions can provide much needed zest in one’s life, and we can only imagine the dreariness of life without occasionally giving into our desires. These momentary indulgences should have only minor effects on long-term goals. It is only when people catastrophize their minor lapses that these become relapses. This was a key point we made about lapse-activated disinhibition (i.e., similar to Marlatt’s abstinence violation effect). We consider this misregulation because zero-tolerance beliefs about self-control are clearly related to self-regulation failure (in that they demand perfection and therefore they are almost destined for failure). Similarly, it would be ludicrous to focus on distal goals (at the expense of our immediate temptations) if there is a chance that the future payoffs are unlikely to be realized (i.e., when the future is uncertain). The animal models of self-regulation may be useful for testing sensitivity to variability in payoff ratios (see Logue or Tomie). Finally, we note that some goals are better met when one pays attention to current surroundings rather than to distal goals (as mentioned by Bandura). Although distal goals are often the focus of self-regulatory efforts, many purposeful behaviors are aimed at achieving more short-term goals. We do not see these latter points as inconsistent with our model.

**Strength**

One of the more contentious aspects of our model was our proposition that self-regulation may be viewed as a strength in which individuals differ. We proposed that self-regulation capacity is similar to a muscle, which if left alone becomes flaccid but if exercised judiciously becomes strong. People need to learn to control their impulses and it is only with regular practice and effort that they become able to exert self-control when faced with temptations. Thus, we view self-regulation as a strength that develops and that can become weakened or strengthened by circumstances. This is not exactly a novel view on volition: Aristotle argued that just as the artist and craftsman become expert through training and practice, the virtuous person be-

---

1 From our perspective, pigeon or rat models of self-regulation are limited in their usefulness for understanding human self-regulation. Although some animals can be taught to behave as if they were self-regulating, this behavior is entirely under the control of the experimenter and is contingent on sensitivity to alterations in the pattern of reinforcement. A full discussion of the usefulness of animal models of volitional behaviors would consume an entire issue of this journal.
comes temperate by repeatedly refraining from temptations. William James (1899/1992), in a lecture to school teachers, noted that one acquires good habits by repeatedly practicing small acts of self-discipline. Thus, it has long been recognized that people can gradually build self-regulatory strength (and therefore that people can also fail to develop this capacity).

The commentators noted that there have been few independent tests of the strength construct and we agree that such tests should be a priority for future research. Indeed, we are conducting some tests, in which self-regulatory exertion in one sphere should be followed by subsequent decrements in self-regulation in other, very unrelated spheres (e.g., Muraven, Tice, & Baumeister, 1995). Our example of dieters breaking their diets at night because of fatigue may not have been the best example, but we maintain that self-regulatory capacities can become fatigued and fail (just as the canoeist with exhausted arms will eventually be unable to resist the currents and will be carried along until strength resumes). Indeed, we view emotional distress as causing self-regulatory failure partially because it depletes or fatigues coping resources (Heatherton & Renn, in press; Heatherton, Striepe, & Nichols, 1995).

In general, we view strength as a pool of resources that a person has available to cope with temptations, urges, and desires. We note that resource models of self-relevant processes are becoming increasingly popular (see the discussion by Kanfer); for example, resource-based models of emotional states (Thayer, 1989), mood (Morris, 1992), and self-esteem (Steele, 1988) have all been recently proposed.

In our model, self-regulatory strength refers to the cognitive resources that one has available to override, alter, or inhibit responses dictated by habit, learning, situation, or physiology. This definition is related to the notion of cognitive capacity or limitation of attentional resources (models appear to sit well with Smart & Wegner and Cervone). Novel or difficult tasks consume a lot of our attention but over time and given appropriate practice and training, humans and animals can become adept at almost anything. People can learn to control their thoughts, emotions, and behaviors by acquiring specific strategies (e.g., learning to focus thoughts through transcendental meditation, learning to cope with problems through active planning, and learning to play golf through practicing their swing) and as people become better at using these strategies they also use their cognitive (or attentional) resources more efficiently. Thus, automatization of tasks and strategies mean these behaviors will be less taxing over time (i.e., less effort is required). We are in general agreement with Wegner (1994) that self-regulatory strength increases as a function of increasing sophistication or efficiency of behavioral skills as well as a function of automatization of the task (automatic processes use less resources than controlled processes). From a strictly cognitive interpretation of the strength model, fatigue leads to self-regulation failure not because of its direct effect on skills (after all, one’s skills or strategies are likely to remain effective), but because of its effects on capacity to use specific skills or select efficient strategies.

It has long been known that fatigue and emotional distress affect cognitive resources (Broadbent, 1958), and recent attention-allocation models provide some possible mechanisms for these effects. Although early attention models assumed that unattended information passively decays when not actively processed (Broadbent, 1958), more recent models suggest that people need to actively inhibit irrelevant or competing information. (Wegner’s 1994 ironic processing model is a good example.) One source of evidence for this process of active inhibition can be found in the negative priming paradigm developed by Tipper (1985, 1992). In these studies, participants were required to ignore information on a given trial, and during a subsequent trial the participants were asked to name or respond to the previously ignored information. Negative priming occurs when participants show an increase in reaction time when asked to name or respond to the stimulus that was previously ignored, compared to trials in which they did not previously ignore the stimulus. Negative priming can be considered evidence that participants are successful in their attempts to ignore stimuli or classes of stimuli. Certain situations cause people to have difficulty ignoring irrelevant stimuli and therefore they do not show the negative priming effect. For instance, contextual cues (Chawarski & Sternberg, 1993) and cognitive load (Tipper, 1992) can diminish negative priming. Thus, when people are fatigued or overloaded they are less successful at ignoring distracting information, and therefore cues and temptations may have a particularly powerful influence over behavior.

There are a number of unanswered questions about self-regulatory strength: Are there enduring individual differences? Is strength a unitary or multidimensional construct? How does it become stronger? We argued in our book and in our target article that repeated efforts at self-discipline will increase self-regulatory capacity. We stand by that assertion and we suggest that empirical studies of “boot-camp” experiences may provide important information about this process. Herman notes that there is a natural trade-off between the strength of the force holding the impulse and the strength of the impulse. We ought to be able to make predictions about the conditions under which stimuli would overpower even strong self-regulatory capaci-
ties. Thus, even though the notion of self-regulatory strength is not new, there are a number of important unanswered questions that are worthy of future study.

Finally, Berkowitz raises the intriguing link between the strength model and the current move toward more "conservative" values and suppositions. Without worrying too much about the rightness (or leftness) of our position, we do acknowledge our general agreement with social critics who decry the tendency for Americans—and Canadians—to deny responsibility for their actions by claiming to be victims (Kaminer, 1993; Peele, 1989).

**Acquiescence**

Many of the commentaries were ambivalent about the extent to which people acquiesce in their self-regulatory failures. The "gun to the head" example sparked considerable debate (see Pervin) and Cervone correctly points out that philosophers have long argued about the validity of that particular morality game. Cervone goes on to argue that the real test is not whether people can resist temptation when they have a gun to their heads, but whether they can resist temptation given their actual circumstances. Of course this is correct, but it is not the point we sought to make. If self-regulation failure were simply a matter of truly irresistible impulses, there would be little need to discuss the breakdown of the control system or the factors that promote acquiescence. Our example was intended simply to convey the fact that people could resist those impulses if they had a sufficiently strong reason to do so, such as a gun to the head. There are some impulses that cannot be resisted under those circumstances; for example, a person ordered at gunpoint to remain standing will eventually have to sit or lie down anyway.

However, there are relatively few instances of such truly irresistible impulses. Far more often, people do allow themselves to lose control, and their acquiescence is an important and fascinating topic of self-regulation theory. For one thing, it reveals the fact that self-control has costs: Sometimes people will prefer to give in than to undergo the strenuous frustration that self-control requires.

Another important and fascinating consequence of the resistibility of impulses is that people go through remarkably clever and subtle processes of acquiescence. People who know that they will have difficulty refraining from smoking while in a bar with their friends essentially give themselves permission to smoke simply by agreeing to join their friends in the bar—they choose to enter a bar where they know they will be confronted by cues to smoke. Self-control is neither easy nor convenient (after all, people want to maintain contacts with friends), but if they really needed to, people could control their smoking (or gambling, or drinking, etc.). Indeed, choosing a new circle of friends or a new environment may help people cope with temptations, and some of our research has shown that people find it much easier to make major life changes (e.g., quitting addictions) when they move away from negative influences (e.g., family and friends; Heatherton & Nichols, 1994). Shapiro's comment made the important suggestion that acquiescence in self-regulatory failure should be linked to the psychology of self-deception.

Thus, in real life there is indeed rarely a gun to the head. Seldom do people walk up to alcoholics and force them to buy bottles at gunpoint; and although waitresses can be quite persuasive (Herman, Olmsted, & Polivy, 1983), they do not often make the choice of dessert a matter of life or death. In reality, people put themselves in situations that provide temptations and by doing so they take an active role in succumbing to their temptations. Moreover, people make motor actions to indulge their impulses—they may be ambivalent about doing so and they may be operating at low levels of self-awareness and with limited cognitive capacity when they do, but at some point they pour the alcohol down their throats or swallow the cheesecake.

The process through which people acquiesce is not entirely clear. Indeed, we have slightly different takes on the mental processes that typically accompany self-regulatory failure, although both are based on Baumeister's (1991) escape from self-awareness theory (which can be used to understand disinhibited behavior across a number of behavioral domains). For Baumeister, people actively choose the escapist behavior: some choose masochism, some choose alcohol, and others choose religion or eating. Thus, people actively choose an activity that will distract them from their problems (see Polivy and also the discussion by Carver & Scheier). From this perspective, acquiescence is extremely high. Heatherton's view of the escape-disinhibition process is somewhat different (Heatherton & Baumeister, 1991; Heatherton & Renn, in press). He argues that disinhibition comes mainly after the escape from self-awareness, such that people escape from
aversive self-awareness and then they are in a state of disinhibition (because low levels of awareness preclude focusing on moral implications of behavior or on distal goals). Thus, any behavior that is actively inhibited (e.g., binge eating, sexual acts, or binge drinking) becomes disinhibited. The person who diets will eat, the person who is trying to cut down on alcohol will drink, and the gambler gambles. (In this way, the model is similar to Wegner's ironic-processing model.) From this perspective, there is less emphasis on acquiescence. Thus, we differ slightly in the our view of how people acquiesce (in that Baumeister's writings have emphasized the choice of escape). However, we share a belief that people can develop much greater capacities to control their behaviors and that people often are active participants in their self-regulatory failures.

Biology, Learning, and Culture

Zucker and Ichiyama remind us that a full understanding of social problems such as addiction, violence, and teenage pregnancy needs to consider biological and cultural factors (see also Berkowitz's commentary). Although these behaviors include a self-regulatory component, there are a myriad of other contributing factors that are beyond the scope of our model and beyond the scope of volitional models in general. For instance, cigarette smoking has been shown to be primarily motivated and maintained by addiction to nicotine (Fagerström & Schneider, 1989; Fagerström, Heatherton, & Kozlowski, 1990; Henningfield, 1984; U.S. Department of Health and Human Services, 1988) and alterations in nicotine delivery have been shown to alter smoking behaviors (Kozlowski & Heatherton, 1990; Kozlowski, Heatherton, Frecker, & Volte, 1989). Nonetheless, it seems possible to us that the biological underpinnings of volitional behaviors may be oversold in some situations. For example, a well-known physiological psychologist was recently on the talk-show circuit arguing that women had no control over chocolate intake because of its effects on serotonin (i.e., women eat chocolate because of a physiological, uncontrollable need), but we have observed women to resist chocolate on occasions. Moreover, with some regularity we hear about the latest medical breakthrough in the pharmacological treatment of obesity (even though obesity continues to increase throughout North America). It is unlikely to us that any gene, neurotransmitter, neuron, hormone, or brain site will ever be identified that provides a full explanation for why people gamble, procrastinate, binge eat, or buy too many neckties.

Psychologists have tended to ignore self-regulatory processes in favor of the more reductionistic and deterministic mechanisms (especially biology and reinforcement). Because physiological explanations are particularly credible and persuasive to the public, people eagerly and unwarily accept media reports about new biological reasons for their inability to control behavior. After all, the implications of such findings are that people are not "at fault" for engaging in undesirable activities (paradoxically, people seem happy to be hapless). Unfortunately, if people come to believe that their behavioral problems are beyond personal control, they may fail to attempt any efforts at changing or controlling the behavior. For instance, the number of Americans who believe that alcoholism is an uncontrollable disease has increased dramatically in the past few decades and at the same time many millions more have identified themselves as alcoholics (Peel, 1989). We are not suggesting that alcoholism is a trivial or easily solved condition, but we do believe that some people would be better off if they focused more on self-control and less on their inability to control behavior.

We agree with the many commentaries that identified cultural and societal factors as being extremely important for understanding self-regulatory failures. Indeed, in both our target article and in our book we speculate that contemporary North American society has become fatalistic regarding problems with personal control. Psychologists may inadvertently have helped create this problem by convincing some people that all their problems derive from past traumas, childhood events over which they had little control, or from biological destinies. Popular misinterpretations of Freud have generated a common belief that stifling any feeling or impulse is harmful, which has discouraged people from controlling themselves. Although traumas, acquired habits, and physiology are important, psychologists may have undersold the human capacity for self-regulation.

A full understanding of human behavior requires a multilevel analysis, from the most microscopic neurophysiological approach to the most macroscopic sociocultural analysis (Cacioppo & Berntson, 1992). Our level of analysis has been on the social—cognitive factors responsible for the control of volitional behaviors. Our emphasis has been on trying to understand how and why an actor's personal efforts are related to success or failure at controlling behavior, a level of analysis that we believe has been relatively ignored. We are not suggesting that self-regulation explains all addictive

---

3 Herman proposes that each generation bemoans the lack of self-control among the younger generation. However, we note that in current North American society it is the adults who are out of control.
and self-control problems. Rather, we merely assert that self-regulation is an important component of these behaviors and may be useful for helping to understand why efforts to control behavior fail. Thus, we are hopeful that future models of addiction take self-regulatory processes into account.

Some Unresolved Issues

Research on self-regulatory issues has exploded since the 1960s (see the historical discussion by Ainslie). Many of the commentaries made the point that there is now a sufficient empirical and conceptual base on which to develop and test models of self-regulation failure (see Karoly). Our model of self-regulation failure is based on our review of the extant empirical literature and therefore there are no direct tests of the validity of our specific model. However, our model makes a number of clear predictions and we are hopeful that it will serve as a valuable guide for future research on the topic. In this final section, we briefly outline some of the most important unresolved questions.

Are There Independent Measures of Strength?

The strength model of self-regulation suggests that there are individual differences in self-regulatory capacities. The study of early conceptual models such as ego strength (see Funder, Block, & Block, 1983) and delay of gratification (Mischel, 1974) provide empirical methods for assessing self-regulatory capacity. We predict (and hope) that new, additional individual differences measures of self-regulation (both behavioral and self-report varieties) will be developed and validated. For instance, techniques used by experimental cognitive psychologists (e.g., priming and negative priming) may be useful for testing cognitive capacity and resistance to external cues and temptations.

Self-regulatory strength shares some conceptual similarity to other imputed mechanisms, such as bodyweight set point. Considerable evidence supports the existence of some form of natural weight or set point, and yet it is difficult to find independent verification of the existence of set point. Nonetheless, we are confident that a strength model will allow for unique and testable predictions that will advance our knowledge of how and why self-regulation fails.

Self-Management

One issue that emerged in a number of the commentaries was the hierarchical arrangement of goals. We used the term self-management to describe the simultaneous regulation of multiple and conflicting goals. Our model falls short of providing a full explanation of the structure of self-management, however. The manner by which people establish standards, goals, and priorities is an important area for future empirical study. Individual differences in goal setting may be related to preexisting differences in self-esteem or to personal beliefs and self-efficacy. It is equally plausible, however, that self-efficacy derives from differences in innate ability and that some people value only those skills and domains in which they excel. Thus, we consider there to be a number of interesting questions regarding personal beliefs, goals, and self-regulation.

Serial or Parallel Process? Linear or Nonlinear?

Cybernetic models, such as those advocated by Carver and Scheier, view action control as a series of chained evaluations and decisions that follow a fixed sequential pattern (Carver & Scheier, 1981, 1992). As such, cybernetic models are usually conceived of as serial processes, in that evaluations and decisions are limited to one action at a time. However, self-regulation involves many mental processes that because of their speed and complexity must occur simultaneously. Moreover, self-regulation is a dynamic system with most of the components interacting with each other (Kanfer). The perceptual, evaluative, cognitive, and volitional aspects of self-regulation cannot be considered to be independent processes, for they all rely on the simultaneously occurring percepts, decisions, and actions. For instance, the setting of goals, awareness of goals, and evaluation of goal attainment all depend on preexisting levels of self-esteem, and, at the same time, each of these may alter or bias self-relevant feelings. Thus, models such as the parallel-distributed processing models used by the connectionists may be useful for understanding the overall dynamical self-regulatory process.

We also have little doubt that models of self-regulation will gain from the metaphors used in chaos theory (i.e., nonlinear dynamic models). For instance, Karoly’s motivational resonance model and Carver and Scheier’s catastrophe phenomenon suggest that such analogies may be quite useful for understanding self-regulatory processes. We are excited about the possibilities that such models will help predict and explain how and why self-regulation fails.

Summary

Research over the last 30 years has provided an empirical base for comprehensive models of self-regu-
lation. Our review and conceptual model identified a number of key components of self-regulation failure, a topic that we believe has been somewhat neglected. The 18 commentaries on our review raised a number of excellent questions about how our model works and highlighted many of the most important unresolved questions. We are grateful for the opportunity to further clarify and explicate the important features of our model and we look forward to continuing discussions about its merits and limitations. We hope that our review and the subsequent commentaries will provide a much needed stimulus for empirical research on how and why people fail at self-regulation.

Note

Todd F. Heatherton, Department of Psychology, Dartmouth College, Hanover, NH 03755; e-mail heatherton@dartmouth.edu.

References


