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What limits self-control?

A motivated effort-allocation account

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> It is one of the strange ironies of this strange life that those who work the hardest, who subject themselves to the strictest discipline, who give up certain pleasurable things in order to achieve a goal, are the happiest men.
>
> *(Brutus Hamilton)*

At this point, the critical role of self-regulation and self-control in achieving health and well-being is virtually undisputed. As the decades of research reviewed in this volume clearly illustrate, simply improving the ease or frequency with which people exert self-control would do much to alleviate a variety of individual afflictions and societal ills.

One major obstacle to achieving such improvements, however, is that exerting self-control is often difficult and hard to sustain. People's engagement in self-control seems to inevitably wane over time (Hockey, 2013), and much research has even suggested that exercising self-control toward one objective can impair subsequent control on an entirely different objective (Hagger, Wood, Stiff, & Chatzisarantis, 2010; but see Carter, Kofler, Forster, & McCullough, 2015; Hagger & Chatzisarantis, 2016). That is, as described by Baumeister and colleagues using the metaphor of a muscle, exerting control seems as if it consumes some kind of "energy", which, over time, then produces a state of "depletion" that hinders further efforts toward control (Muraven & Baumeister, 2000). Thus, people typically behave as if their resources for self-control have a fixed capacity that is consumed and leads to a diminished ability for subsequent control.

Although this metaphorical *strength model* of self-control often aptly describes the observed limits of control, recent research has focused on going beyond such metaphors and better articulating the psychological mechanisms responsible for the experienced difficulty of prolonged control (Inzlicht, Schmeichel, & Macrae, 2014; Kotabe & Hofmann, 2015; Kurzban, Duckworth, Kable, & Myers, 2013; Molden et al., 2012). These emerging perspectives differ in some ways, but one mechanism that is central to all of them is the critical role of *motivations for* rather than the *capacity of* self-control. Therefore, the present chapter reviews these various motivational influences and integrates them into a broader model of self-regulation that (a) identifies the key processes needed to explain why exercising self-control is experienced as difficult, and (b) highlights future research that could best uncover methods of bolstering self-control.

We begin by briefly describing the evidence that motivation rather than capacity plays a prominent role in the exercise of self-control. Next, we detail our model of these motivational processes as a system of effort evaluation and allocation and discuss how this framework provides a comprehensive account of people's experiences of and engagement in self-control (for a more thorough presentation, see Molden, Hui, & Scholer, 2016). Finally, we discuss the agenda our framework sets for future research on improving self-control.

It is important to note at the outset that the framework we propose is a general model of *self-regulation*, which we conceptualize as any instance in which people attempt to monitor and alter their own thoughts and behaviors for some desired objective (cf. Carver & Scheier, 2001). This conceptualization is related to, but broader than, similar processes labeled as *self-control* or *executive function*. Self-control is typically defined as a subset of broader self-regulatory processes involving the effortful and conscious management of conflict between incompatible goals or desires, such as when people are tempted by short-term impulses that interfere with long-term goals (e.g., Fujita, 2011; Inzlicht et al., 2014; Kotabe & Hofmann, 2015). Executive function describes a specific set of psychological mechanisms that include (a) *inhibiting* dominant responses, (b) *monitoring*, sustaining, and updating the contents of attention and working memory, and (c) *shifting* flexibly between appraisals or mindsets (Miyake & Friedman, 2012). Thus, although self-control conflicts and executive function mechanisms are important components of our model of self-regulation, they are only part of the broader processes of self-regulation we outline. That is, as detailed below, we more generally analyze how the motivational dynamics underlying effort and attention toward highly valued goals influence not only failures in managing self-control conflicts, but limits to self-regulation more broadly.

Motivational limits on self-regulation

As noted, Baumeister et al.'s strength model of self-regulation postulates a general, but limited, capacity of mental resources that depletes with use (Muraven & Baumeister, 2000). This would readily explain people's observed struggle to sustain self-regulation. However, much evidence has arisen to challenge this type of capacity explanation for the limits of self-regulation. Such evidence is thoroughly detailed elsewhere (e.g., Inzlicht et al., 2014; Kurzban et al., 2013; see also Bernecker & Job, Chapter 12 of this volume; Milyavskaya & Inzlicht, Chapter 2 of this volume) but a few findings are worth highlighting. First, self-regulation does not appear to diminish over time or when switching from one demanding objective to another if the current objective is (a) paired with large enough incentives (e.g., Muraven & Slessareva, 2003), (b) perceived as especially engaging or important (e.g., Hong & Lee, 2008; Moller, Deci, & Ryan, 2006; Muraven, Gagné, & Rosman, 2008), or (c) one that motivates a close monitoring of the progress being made (e.g., Alberts, Martijn, & de Vries, 2011; Wan & Sternthal, 2008). That is, when people care enough about how well they are progressing or performing on some task, they seem perfectly capable of sustaining self-regulation on that task. Indeed, in response to such findings, Baumeister (2014) himself has recently modified his strength model such that people's motivations to conserve their limited capacity for regulation – unless an objective is deemed particularly worthwhile – serve as the most proximal cause of reduced regulation.

Beyond this evidence for direct influences of motivations arising from the value or importance of sustained self-regulation, other recent findings have illuminated more indirect influences arising from the expectations people form and the experiences they have when engaging in regulation. For example, people sustain self-regulation over time and across demanding objectives when they interpret any experiences of fatigue or difficulty as due to sources unrelated to their efforts at regulation (e.g., to some extraneous feature of the environment or task; see Clarkson,

Hirt, Jia, & Alexander, 2010), or reconstrue this effort as enjoyable (Laran & Janiszewski, 2011). People also sustain self-regulation when they merely imagine their capacity for regulation has recently expanded (e.g., Egan, Clarkson, & Hirt, 2015), or simply do not believe their own regulation is limited in capacity (e.g., Job, Dweck, & Walton, 2010; Bernecker & Job, Chapter 12 of this volume). Similarly, people show reduced self-regulation for non-demanding objectives if they (a) interpret the experiences of effort they do have as caused by their self-regulation (e.g., Clarkson et al., 2010) or (b) merely expect or imagine they will complete some strenuous task in the near future (e.g., Macrae et al., 2014). Finally, even in the absence of specific attributions about or expectations of engaging in self-regulation, experiences that simply increase relaxation or boost tolerance for effort – such as watching a humorous video clip or favorite television program (e.g., Derrick, 2013; Tice, Baumeister, Shmueli, & Muraven, 2007) or affirming one's core values (Schmeichel & Vohs, 2009), to name just a few examples – can also bolster self-regulation (for a recent overview of the many cognitive and motivational factors that offset decrements in self-regulation, see Masicampo, Martin, & Anderson, 2014).

Together, these latter findings strongly suggest that although, as Baumeister (2014) claims, people are motivated to conserve effort (see also Kool & Botvinick, 2014; Kool, McGuire, Rosen, & Botvinick, 2010), these motivations can arise from people's mere beliefs about and experiences of pursuing some objective. That is, sustained self-regulation appears to depend as much on the motivational consequences of people's beliefs and perceptions about how much self-regulation they have already exercised, how much regulation might be required in the future, or even simply how relaxed or mentally taxed they are currently feeling, as it does on the actual amount of regulation in which they have engaged thus far. Such findings thus further challenge any role of a fixed capacity in limits to self-regulation and further highlight the central role of motivations.

A motivated effort-allocation model of self-regulation

Because of all of these known moderators of limits to self-regulation, newly emerging perspectives on this process place people's motivations and experiences at the center of when and why they display limits to regulation (e.g., Inzlicht et al., 2014; Kotabe & Hofmann, 2015; Kurzban et al., 2013; see also Bernecker & Job, Chapter 12 of this volume; Milyavskaya & Inzlicht, Chapter 2 of this volume). However, a fully systematic analysis of the contribution of the various motivational influences outlined above and how they operate together is still largely absent. Therefore, we have built upon the growing consensus and developed a model of self-regulation integrating all of these influences that is based upon shifts in motivations arising from the experiences of engaging in such regulation (see also Molden et al., 2016). Drawing on classic models of goal selection and goal pursuit, this *motivated effort-allocation* (MEA) model attempts to provide a comprehensive account of when and why people sustain self-regulation and, thus, to identify critical areas for further research.

The cycle of motivational assessment, allocation, and monitoring

The general structure of the MEA model is presented in Figure 11.1. This structure is cyclical with three main components: (a) the *assessment* of how strongly one is motivated to engage in self-regulation, (b) the *allocation* of effort and attention to self-regulation produced by this assessment, and (c) the *monitoring* of the consequences and experiences of this allocation, which then spurs a further reassessment of one's motivations to continue self-regulation.

The MEA model thus places motivations for continued self-regulation within the context of long-established cybernetic control theories. Control theories of motivation are defined by a

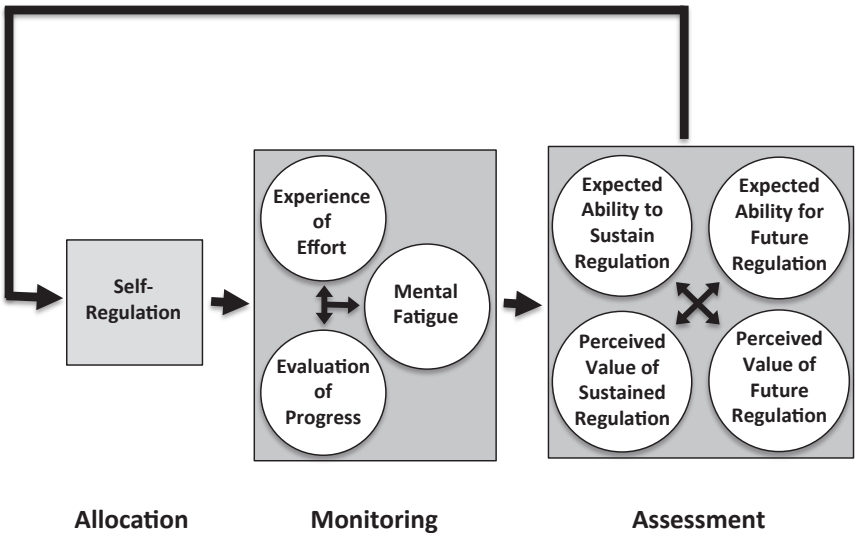

Figure 11.1 A motivated effort-allocation model of self-regulation. Assessments of motivations to exert self-regulation produce allocations of effort and attention to engage in regulation. The consequences of self-regulation are then monitored and motivations to continue regulation reassessed

continuous feedback-loop that functions to assess and respond to discrepancies from a desired state (Carver & Scheier, 2001). In the MEA model, we propose that people initially assess whether engaging in self-regulation is likely to produce such a desired state. This assessment then determines the strength of their motivation for regulation and produces a matching allocation of attention and effort to pursuing the appropriate actions. Following this allocation, we propose that people then monitor whether self-regulation is effectively bringing about the desired state by evaluating the costs and benefits of their current level of regulation and adjusting their motivations for continuing accordingly. These evaluations of costs and benefits are proposed to arise directly from people's perceptions and experiences of pursuing self-regulation. If, at any point, these experiences signal that the costs of sustained effort outweigh the benefits of progress toward the desired state, then people's motivations for self-regulation, and their effort and attention toward their current task, diminish. Thus, overall, self-regulation should persist as long as people's experiences of pursuing regulation sustain their motivations to continue (see also Inzlicht et al., 2014; Kurzban et al., 2013).

In the following sections, we elaborate more on how we conceptualize each of these processes and their ongoing interactions, but some general considerations are worth noting at the outset. One is that, although Figure 11.1 portrays assessment, monitoring, and allocation as a series of sequential stages, we assume these processes are dynamically updated and can occur in parallel (e.g., Ehret, Monroe, & Read, 2015). For example, any changes in people's monitored experiences of self-regulation may instantaneously alter the online assessment of motivations to continue regulation and the associated allocation of effort and attention to reestablish the appropriate equilibrium between these processes.

A second, related, general consideration of the MEA model is that, although assessment, allocation, and monitoring may often involve conscious deliberation and intentional action, this need not be the case. Accumulating evidence suggests that self-regulation can be initiated and pursued outside of intention and awareness (Gillebaart & De Ridder, Chapter 4 of this volume).

We therefore assume that the assessments of perceived ability, assignments of value, and monitoring of effort and progress detailed below can all occur not only in parallel, but also without awareness or intention (see Bijleveld, Custers, & Aarts, 2012; Marien, Custers, Hassin, & Aarts, 2012). Although conscious attention to these processes could change how their specific outputs are weighted or interpreted during self-regulation, generating and integrating these outputs is not presumed to require such attention.

A final general consideration of the MEA model is that the monitoring and assessment processes portrayed in Figure 11.1 concern motivations to engage in self-regulation toward some objective, but are not necessarily equivalent to overall motivations to accomplish that objective itself. That is, the MEA model specifically describes the proximal regulation of effort or attention directed toward some goal rather than the ultimate value placed on the goal. Thus, if motivations for self-regulation wane, people may temporarily cease actively pursuing a particular goal but not necessarily disengage from this goal overall (e.g., choosing to skip a particular workout or end it early does not mean that one has abandoned the goal to get in shape). This hierarchical distinction is essentially equivalent to one made by Duckworth and Gross (2014) between sustained goal pursuit in the moment (what they label *self-control*) and sustained goal pursuit over an extended period of time (what they label *grit*), and the MEA model is primarily designed to explain self-regulation of the former rather than the latter variety.

Assessing motivations for self-regulation

Beyond placing self-regulation within the context of control theories of motivation, the MEA model also integrates other well-established motivational principles. First, as Figure 11.1 illustrates, assessments of motivations to initiate, continue, or withdraw from self-regulation incorporate longstanding theories on the role of expectancy and value in goal-setting and goal pursuit (Feather, 1982). That is, these assessments depend upon both people's expectations concerning their ability to muster the effort and attention they believe self-regulating toward some outcome will require, and the total value they believe regulation will have for producing this outcome. Similar to traditional motivational theories of expectancy and value, the MEA model further assumes a multiplicative relationship between these two factors; as either expected ability for self-regulation or perceived value of this regulation becomes increasingly low, then the actual self-regulation allocated to an objective will rapidly diminish as well. Thus, the less effective people judge that self-regulation will be for producing desired outcomes due to either their expectations for or value of this regulation, the less they will be motivated to allocate effort and attention toward self-regulation.

However, the MEA model also extends traditional considerations of expectancy and value by including not only evaluations of the self-regulation people are currently pursuing, but also the potential regulation they believe they might pursue in the near future. To capture the demonstrated influence of beliefs about limited capacity for self-regulation, and, as discussed earlier, the concerns with conserving effort this may produce (see Job, Bernecker, Miketta, & Friese, 2015), the MEA model proposes that motivations for self-regulation depend on people's assessments of both the specific outcomes they could currently pursue and any specific outcomes they might want to pursue in the immediate future (or of just the possibility of immediately pursuing some future outcome in general). As Figure 11.1 further illustrates, this assessment of potential future outcomes again presumably relies both on the expected ability to summon the effort and attention such outcomes might demand, particularly in light of one's current efforts at self-regulation, and the value this future regulation would contribute toward accomplishing them, particularly as compared to the value of current regulation.

Moreover, the MEA model assumes the influence of these additional factors on motivations for current self-regulation follows some inverse multiplicative relationship; as either anticipated ability for future self-regulation in light of current regulation becomes increasingly low or perceived value of future regulation as compared to current regulation becomes increasingly high, then the self-regulation allocated to a present objective will, again, rapidly diminish. Thus, the more people consider self-regulation toward some objective in the near future as either potentially constrained by current regulation or particularly more valuable than current regulation, the less they will be motivated to allocate effort and attention toward this current regulation.

In summary, according to the MEA model, people's motivation to engage in self-regulation arises from their assessments of what this regulation can accomplish. This assessment depends on the combination of the expected ability for engaging in and value placed on self-regulation toward present objectives and, at the same time, on the combination of the relative ability for engaging in and value placed on potentially self-regulating toward other potential objectives in the immediate future. In this way, the assessment stage of the MEA model captures the dynamic influence of both motivations to sustain effort on the current focus of self-regulation and motivations to conserve effort for important demands for future regulation that might subsequently arise.

Monitoring the consequences and experiences of self-regulation

Once assessment processes activate motivations to engage in self-regulation toward a desired outcome, and these motivations evoke the allocation of effort and attention toward pursuing the outcome, the MEA model proposes that this also activates a monitoring process to evaluate how effective the current level of self-regulation is perceived to be in producing the desired outcome. This monitoring process then has further motivational implications for continued self-regulation. As shown in Figure 11.1, drawing again on control theories of motivation, the first component of this monitoring is an evaluation of the progress made toward the desired outcome, which includes not only how close to success one is but also how quickly one is progressing toward success (Carver & Scheier, 2001). This aspect of monitoring captures the perceived benefits produced by self-regulation.

However, once again, the MEA model extends traditional control theories by also including in the monitoring process evaluations of effort as well as progress. Drawing upon recent reconceptualizations of experiences of mental fatigue as a motivational signaling process (Hockey, 2013; Kurzban et al., 2013), we propose that the second major component of the monitoring process is an evaluation of the effort – as defined by the level of sustained, focused attention – required to self-regulate toward the desired outcome. This aspect of monitoring captures the perceived costs produced by self-regulation.

Furthermore, as also shown in Figure 11.1, although evaluations of effort and progress are independent, the MEA model proposes that these two evaluations are integrated during the monitoring process. The output of this integration is defined as a weighting of the benefits of perceived progress achieved through self-regulation by the costs of the perceived effort required to sustain this progress. That is, monitoring processes produce an overall evaluation of the *worth* of maintaining current levels of self-regulation, which we suggest is based on the ratio of progress to effort. Thus, as the perceived progress produced by self-regulation becomes increasingly small or the perceived effort required to sustain self-regulation becomes increasingly large, then the overall worth of continued regulation will rapidly diminish.

Two additional aspects of these evaluations of worth should be noted. First, the MEA model proposes that the evaluations of worth that occur during monitoring produce specific

phenomenological experiences of mental fatigue; as the judged worth of continuing self-regulation diminishes, experiences of mental fatigue grow (see also Kurzban et al., 2013). This distinguishes experiences of fatigue from experiences of effort. Whereas we define perceptions of effort as arising from the direct experiences associated with sustaining focused attention during self-regulation, we define perceptions of fatigue as arising from the accumulated effects of this effort on the judged worth of continued regulation (see Hockey, 2013).

Second, the MEA model proposes that even if effort and progress during self-regulation remain constant, over time, the judged worth of self-regulation will still decrease and mental fatigue will increase. Much research has shown that on tasks requiring sustained effort and attention, performance steadily declines and reported fatigue increases (e.g., Wascher et al., 2014). Although these effects are somewhat offset by later introducing additional incentives, neither performance nor fatigue typically return to their original levels (e.g., Lorist et al., 2009). In addition, people evaluate the effort that self-regulation requires as inherently costly; they will forgo greater rewards and even prolong the overall time they spend performing a task to reduce their acute experiences of effort (Kool & Botvinick, 2014; Kool et al., 2010). Therefore, as effort toward self-regulation continues, it should be perceived as increasingly more costly (see also Inzlicht et al., 2014; Kurzban et al., 2013), fatigue should accumulate, and judgments of worth should decrease.

In summary, according to the MEA model, people's evaluations of the consequences of engaging in self-regulation arise from their monitoring of what this regulation is worth. Judgments of worth depend on the ratio of the perceived benefits of the progress made through self-regulation to the perceived costs of the effort required to sustain this regulation. Moreover, judgments of worth are proposed to directly elicit experiences of mental fatigue, which progressively accumulate during self-regulation due to the inherent perceptions of additional costs associated with sustained effort. Thus, when the perceived progress produced by self-regulation outweighs accumulated experiences of the effort it requires, judged worth will be higher and experienced fatigue will be lower. But, once accumulated experiences of effort outweigh perceived progress, judged worth will be lower and experienced fatigue will be higher. In this way, the monitoring stage of the MEA model captures how online evaluations of momentary fluctuations in the experiences of engaging in self-regulation, as well as how these experiences progress over time, dynamically affect ongoing impressions of whether regulation is producing desirable effects.

Reassessment and reallocation

The final component of the MEA model is that the judgments of worth emerging from the monitoring of ongoing self-regulation provide additional motivational influences on whether to engage or disengage in this regulation. That is, these judgments spur a cyclical reassessment of whether sufficient motivations still exist to continue regulation. As Figure 11.1 illustrates, the perceived worth of sustaining self-regulation signaled by evaluations of effort and progress reengages the assessment process detailed above. Thus, the experience of fatigue produced by judged worth creates motivational signals that may alter the perceived ability for and value of continued self-regulation and update motivations to continue regulation (see also Hockey, 2013; Kurzban et al., 2013). If judged worth is high and fatigue is low, perceptions of ability and value for continued self-regulation should also generally remain high and produce sufficient motivations for sustaining regulation versus conserving effort for the future (or, if the judged worth is high enough, motivation for current regulation could even increase). But, if judged worth is low and fatigue is high, perceptions of either ability for or the value of continued

regulation, or both, should decrease and motivations to continue self-regulation versus conserve effort should diminish.

Thus, on the whole, the MEA model explains self-regulation in terms of motivations to commit effort and attention toward valued goals. Even if overall motivations to accomplish some objective remain high, when the judged worth of continuing self-regulation to pursue this objective diminishes and fatigue arises, motivations to sustain such regulation may dissipate (cf. Duckworth & Gross, 2014). Furthermore, because the perceived costs of effort and experiences of fatigue during self-regulation accumulate, after completing or withdrawing from regulation toward one objective, motivations to pursue regulation on subsequent tasks may still be diminished. Such motivational disruptions can thus explain not only failures to sustain self-regulation toward current goals, but also carryover effects of exerting regulation in one domain to subsequent self-regulation failures in another (see also Kool & Botvinick, 2014; Kurzban et al., 2013; Inzlicht et al., 2014; Milyavskaya & Inzlicht, Chapter 2 of this volume).

Additional factors influencing assessment, monitoring, and allocation

The MEA model presented in Figure 11.1 incorporates both the direct effects of motivation on self-regulation from the value placed on some objective and the indirect effects of motivation on self-regulation from the perceptions and experiences of pursuing this objective reviewed at the outset. That is, within one central framework, the MEA model explains the effects on self-regulation of all the diverse incentives, attributions, lay theories, or subjective experiences discussed earlier (see also Masicampo et al., 2014). As illustrated in Figure 11.2, additional variables arising from (a) the objectives toward which people are self-regulating, (b) how they

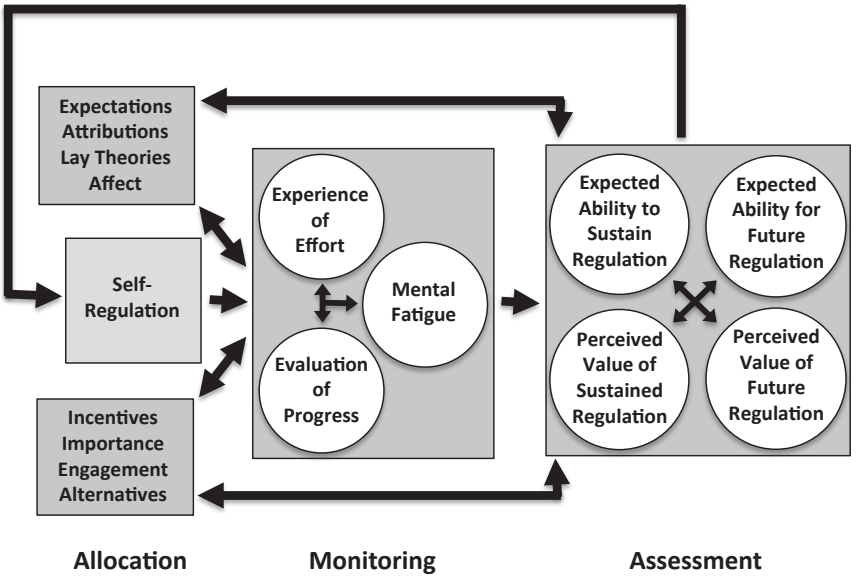

Figure 11.2 Examples of additional influences on motivated effort-allocation during self-regulation. A variety of cognitive and motivational processes can alter and interact with both the assessment of motivations for self-regulation and the monitoring of the consequences of the attention and effort allocated to regulation

represent or experience these objectives, or (c) whatever additional opportunities are present all can affect self-regulation by altering the final output of both assessment and monitoring processes.

Assessment

Many variables could directly affect the assessment of motivations to sustain self-regulation. For example, even if monitoring of progress and effort results in fatigue and indicates low judged worth for continued self-regulation, as reviewed above, increased incentives associated with the personal importance of or the motivational engagement produced by the outcome of current regulation could still directly enhance the perceived value of this regulation and bolster assessed motivations to continue (Muraven & Slessareva, 2003). Furthermore, high perceived efficacy for sustaining self-regulation or attributions of fatigue to motivationally irrelevant features of the environment could directly counteract effects of low judged worth of regulation and experienced fatigue on expected ability to sustain regulation. This could again independently bolster assessed motivations to continue (Chow, Hui, & Lau, 2015; Clarkson et al., 2010).

In contrast, even if the monitoring of progress and effort does not result in fatigue and indicates high judged worth for sustained self-regulation, perceived opportunities to pursue alternative highly valued goals or to obtain immediately desirable rewards could directly undermine the perceived value of the current regulation and independently impair assessed motivations to continue. Furthermore, beliefs that one's mental capacities are limited or attributions of fatigue to one's lack of capacity to continue (Clarkson et al., 2010; Job et al., 2010; Bernecker & Job, Chapter 12 of this volume) could directly counteract high judged worth for regulation by undermining expected ability to sustain regulation in the present or to reinitiate regulation in the near future; this would again undermine assessed motivations to continue. Thus, overall, variables that independently affect any of the components of the assessment process in Figure 11.2 should also moderate the ultimate impact of the motivational signals produced by monitoring processes on cumulative motivations to sustain self-regulation.

Monitoring

Beyond directly influencing motivations to continue self-regulation through effects on assessments of these motivations, many variables could also influence the motivations arising from the monitoring of the consequences of self-regulation by altering either the experiences of effort during regulation or the evaluations of the progress this regulation produces. For example, actions or environments that increase experiences of relaxation, tranquility, engagement, or just broad positive affect (e.g., Derrick, 2013; Laran & Janiszewski, 2011; Tice et al., 2007) should help sustain self-regulation by counteracting the experiences of accumulated effort and fatigue associated with regulation. Furthermore, as reviewed earlier, what is most critical for these types of influences on monitoring processes is not the experiences themselves, but people's interpretations of how these experiences alleviate the effortful costs of engaging in self-regulation (Clarkson et al., 2010; Egan et al., 2015).

In addition, circumstances that enhance attention to how well one is progressing toward a desired objective, such as the cues or expectations that encourage the monitoring of current task performance or boost the importance or self-relevance of this task (e.g., Alberts et al., 2011; Muraven et al., 2008; Muraven & Slessareva, 2003; Wan & Sternthal, 2008), should also prolong regulation. Expectations or lay theories about how fast progress should occur or the amount of effort it should require could similarly affect these types of evaluations; beliefs that progress should be fast and easy may more quickly result in lower judgments of worth and

reduced motivations for self-regulation if substantial effort is required, whereas beliefs that progress will not only demand effort but can also be measured by the effort expended may sustain judged worth and motivations for regulation (Miele & Molden, 2010; see Molden, 2013). Thus, overall, any variables that independently alter how people either experience the act of engaging in self-regulation or evaluate the progress that regulation produces should also moderate the total judged worth of self-regulation produced by the monitoring process and, in turn, experiences of mental fatigue and motivations for continued regulation.

Allocation

Given the potential for various factors to influence either assessment or monitoring, or both, there are some additional implications of the expanded MEA model in Figure 11.2 for the ultimate allocation of effort and attention. First, any variable may conceivably inhibit or bolster self-regulation through both the assessment and monitoring processes. For example, the autonomy of the objective toward which people are self-regulating can increase motivations for regulation both by directly bolstering the personal importance of and engagement with this objective (Hong & Lee, 2008; Moller et al., 2006) and by indirectly increasing experiences of enjoyment and subjective vitality (Muraven et al., 2008), which would improve the judged worth during monitoring. Similarly, increasing awareness of the process of self-regulation could increase motivations for regulation both by directly increasing focus on the personal values attached to success on the task being performed during assessment (Alberts et al., 2011) and by indirectly increasing sensitivity to perceived progress, which would again improve judged worth during monitoring (Wan & Sternthal, 2008).

Therefore, as Masicampo et al. (2014) noted, many variables may have the same effects on self-regulation whether they are introduced before any regulation has begun, thus potentially altering subsequent assessment of motivations for regulation, or only after some initial regulation, thus potentially altering subsequent monitoring and reassessment of motivations for continuing. However, some variables could have different effects on self-regulation depending upon which process they most directly affect; concrete, low-level mental construals may sustain regulation when they bolster the monitoring of progress toward maintaining a desired standard (Schmeichel, Vohs, & Duke, 2010), but hinder regulation when they increase the focus on immediate evaluations of fatigue that diminish judged worth during assessment of motivations to continue and undermine a focus on broader, abstract values that may still support these motivations (see Kalkstein, Fujita, & Trope, Chapter 15 of this volume). Thus, overall the MEA model emphasizes the importance of considering multiple routes through which various factors may affect the motivations driving self-regulation and whether these effects will be complementary or offsetting.

Implications of a motivated effort-allocation model

The MEA model of self-regulation failure builds upon, and thus overlaps with, other recent perspectives (e.g., Inzlicht et al., 2014; Kurzban et al., 2013; Milyavskaya & Inzlicht, Chapter 2 of this volume). However, we believe that, because it integrates several key aspects of these other models, along with other classic perspectives on self-regulation, the MEA model has several unique advantages and implications (see also Molden et al., 2016).

First, the MEA model broadly captures the full range of circumstances in which people find it hard to initiate or continue self-regulation, from immediate conflicts between alternative goals, to experiences of fatigue or boredom from sustained regulation, to carryover effects

from previous acts of self-regulation to subsequent ones. Moreover, it does so with only four basic components: people's judgments of both the likely outcome and value of engaging in self-regulation and the evaluations of both the effort required and the progress produced by this regulation. Thus, the MEA model does not require problematic distinctions between *desires* and *goals* (e.g., Kotabe & Hofmann, 2015), "short-term" vs. "long-term" priorities or pursuits of *labor* vs. *leisure* (e.g., Inzlicht et al., 2014), or tasks demanding mental effort vs. those demanding self-regulation (e.g., Baumeister, 2014).

Second, the MEA model broadly captures the full range of motivational dynamics involved in sustained self-regulation beyond just perceived value or utility (cf. Kurzban et al., 2013; Inzlicht et al., 2014; Milyavskaya & Inzlicht, Chapter 2 of this volume). Variables altering perceived efficacy at (e.g., Chow et al., 2015; Hui et al., 2009) or perceived engagement in current self-regulation (Hong & Lee, 2008), as well as imagined demands from future self-regulation (e.g., Job et al., 2015; Macrae et al., 2014), can all also directly alter motivations for continued regulation without simply altering the value of the present objective. Furthermore, different variables may simultaneously have conflicting influences on motivations for self-regulation. For example, although accumulating fatigue and low judged worth of continuing regulation may reduce motivations to pursue one's current objective, some findings have begun to suggest that these experiences may also increase attention to the possibility of reward (e.g., Wagner, Altman, Boswell, Kelley, & Heatherton, 2013). To properly study these dynamics (e.g., Giacomantonio, Jordan, Fennis, & Panno, 2014), it is necessary to articulate the separate motivational influences of accumulated effort as part of the monitoring process and changes in expectations of or desire for reward as part of the assessment process, as is possible with the MEA model.

Third, the MEA model provides a detailed analysis of how phenomenological experiences of self-regulation translate into motivations for pursuing regulation. It both specifies the determinants of mental fatigue in terms of evaluations of effort and progress, and distinguishes such fatigue from experiences of sustained effort. Furthermore, it also considers how beliefs about and interpretations of experiences of self-regulation can alter such evaluations and affect motivations to cease or continue regulation (Bernecker & Job, Chapter 12 of this volume; see Molden, 2013). Many of the mechanisms in this monitoring phase of the MEA model, although derived from the existing findings reviewed above, still require further empirical confirmation, but this model provides a clear framework for future research on the experience of self-regulation and its motivational dynamics.

Finally, it is important to note that, although the MEA model suggests that self-regulation is only limited by people's motivations to engage in such regulation, it in no way suggests that these motivations, or the attention and mental effort on which self-regulation depends, are without limit. People do face certain limits in cognition and behavior such that they cannot simultaneously (a) consciously process and attend to every piece of information in their environment (e.g., Franconeri, 2013), and (b) engage in every currently possible action. Therefore, they must constantly prioritize their concerns, which involves difficult tradeoffs requiring evaluations of when to engage or disengage in a variety of actions. Thus, even if there is no fixed capacity for self-regulation itself, the motivations involved in self-regulation often include desires to avoid fatigue and minimize expenditures of effort (Bijleveld et al., 2012; Kool & Botvinick, 2014; Kool et al., 2010) as part of such evaluations, which, at times, may also evoke beliefs in people that there are limits to the levels of effort one can sustain (e.g., Job et al., 2010; Bernecker & Job, Chapter 12 of this volume). These motivations and perceptions that limit continued regulation then help with prioritizing different tradeoffs by ensuring a motivational homeostasis between sustained effort toward currently important goals and a broader reassessment of whether alternative goals might also be worthy of effort.

Summary and implications for health and well-being

On the whole, the MEA model of self-regulation integrates the newly emerging research on the various motivational influences that determine whether people engage in self-regulation. Beyond this, one of the most important aspects of the MEA model is its implications for developing methods to improve self-regulation and self-control.

We began this chapter by noting that self-regulation and self-control are both enormously beneficial and enormously difficult. The primary challenge is thus to understand the difficulty of self-control and to find ways to ameliorate it. The MEA model highlights two broad types of strategies for doing so. The first involves directly bolstering people's assessments of their motivations to initiate or sustain self-control. According to the model, this could be done by making self-control seem more achievable, more rewarding, or more important. Indeed, it has long been known that increasing people's perceived efficacy at pursuing their goals (Stajkovic & Luthans, 1998) or the personal importance they place on them (Deci & Ryan, 2000) can increase persistence and success, and the same should hold true for self-control. However, as outlined in Figure 11.1, the MEA model also suggests that motivations to initiate or sustain self-control could also be bolstered by relieving people's concerns that their present objectives might interfere with their ability to pursue future objectives (e.g., Turner-McGrievy, Wright, Migneault, Quintiliani, & Friedman, 2014). In addition, these motivations might be bolstered by encouraging a more thorough consideration of how rewarding or important self-control would be for these future objectives, which would prevent people from withdrawing effort in the present unless these other objectives were also valuable and important. That is, improved self-control could arise not only from increased motivations for present goals, but also decreased motivations to conserve for future goals, at least when this conservation would be generally counterproductive, and the latter represents a somewhat novel target for future research (see also Bernecker & Job, Chapter 12 of this volume).

The second broad type of strategy for improving self-control suggested by the MEA model involves relieving the experiences of fatigue that arise from people's monitoring of control and undermine the judged worth that influences motivations to continue. This again encompasses well-known approaches such as increasing people's sense of progress (Carver & Scheier, 2001) or reducing their sense of effort (Muraven et al., 2008) while exerting control, but also, as outlined in Figure 11.1, some more novel approaches as well. Pairing the exertion of self-control with environments, experiences, or additional behaviors that counteract or ameliorate experiences of fatigue could also sustain the judged worth of continued control. What could be even more effective would be to prevent experiences of fatigue from arising in the first place by proactively planning and managing one's environment to make enacting control as effortless as possible (e.g., by removing anything that might distract from current objectives or tempt a shift to an alternative goal; cf. Fujita, 2011). These too are important subjects for future research.

In summary, although engaging in self-regulation is often difficult and fatiguing, there is now much evidence to suggest that this difficulty arises not from some finite capacity for regulation, but from the motivational tradeoffs that people must make to optimally manage the various goals they are pursuing. The MEA model provides a comprehensive account of these tradeoffs and outlines a variety of processes that could be critical for understanding and improving self-regulation and self-control. Although identifying these processes does not necessarily make solving the existing challenges of self-regulation easier, it highlights additional strategies for doing so and creates a clearer path forward for studying such challenges. Thus, although it may ultimately be correct that happiness achieved through self-regulation requires hard work, strict discipline, and a renunciation of pleasure, hopefully research inspired by the MEA model can find ways to encourage self-regulation that are less laborious, more enjoyable, and perhaps even more effective.

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