CHAPTER 6

The Role of Habits in Self-Control

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Lack of exercise is a significant risk factor for a number of debilitating lifestyle diseases, including diabetes, cancer, cardiovascular diseases, and chronic lung diseases. However, most adults fall short of meeting U.S. physical activity guidelines. In 2012, fully 46% failed to meet either aerobic or muscle-strengthening guidelines, and only 20% accomplished both of these goals (Centers for Disease Control and Prevention, 2014). Exercise represents a classic self-control dilemma. Despite its many long-term benefits for health and well-being, maintaining an exercise program can require considerable time, is physically taxing, and involves sometimes costly expenditures (e.g., gym membership). Given these short-term costs, it is no surprise that most people do not meet even the minimum requirement for health. However, some people are able to exercise continually and maintain high levels of fitness over time. How do they succeed at this kind of repeated self-control challenge?

One answer comes from Armitage's (2005) classic study of the psychological processes behind new members' gym use. As would be expected, most participants in this study were not very successful at maintaining their exercise program. On average, they used the gym only 1.6 times during the 12 weeks after joining. However, 29% of the new members bucked this trend and consistently used the gym twice a week for 3 months. By evaluating how initial gym use influenced subsequent visits, Armitage showed that the first 5 weeks after joining were critical. Apparently, members who regularly used the gym during these initial weeks formed habits that they then just repeated during the subsequent weeks. It is interesting that, after taking habit strength into account, Armitage's (2005) predictive models did not find that persistence was greater among participants with more favorable attitudes or behavioral intentions to use the gym when they initially joined.

In this chapter, I evaluate how habits contribute to effective self-control and enable people to persistently perform desired behaviors despite temptations and challenges to act otherwise. To begin, I offer a definition of habits based on the social cognitive model of habits developed in our laboratory (Wood & Neal, 2007; Wood & Rünger, 2016). I then review evidence for the classic model of self-control, in which people exert inhibitory resources to prevent bad, unwanted habits. Despite the substantial research supporting

this antagonistic relation between habits and self-control, emerging research also suggests that habits can be a means of effective self-control; that is, much like the new gym members in Armitage's (2005) study, people effectively pursue goals by forming habits that enable them to enact desired responses automatically. Finally, I consider yet another way that habits contribute to self-regulation. This involves informing people's inferences about their goals and intentions. That is, self-regulation does not always proceed through control of behavior but sometimes through behavior itself changing people's goals and desires.

The Nature of Habits

Habits develop as people repeat a behavior (braking while driving) in a particular context (red light), typically as they are pursuing a goal (trying to get to work). Through repetition, people learn covariations between the behavior and features of the performance context. These covariations are then represented in memory in the form of context–response associations. Habit representations in memory contain not only information related to response execution but also information about the sensations and perceptions associated with carrying out the response (Hommel 2009).

With repetition, habit associations become strengthened to the point that perception of context cues automatically brings the response to mind. A variety of cues might trigger habit performance, including aspects of physical environments, other people, and preceding actions in a sequence (Ji & Wood, 2007). Sometimes people deliberately expose themselves to habit cues, such as when intentionally sitting at a computer in order to activate thoughts of work. However, cue exposure is often inadvertent, such as when a chance sighting of an often-used fast-food outlet activates thoughts of eating.

The automatic activation of a habit response in memory was demonstrated in a study with habitual runners, sporadic runners, and nonrunners (Neal, Wood, Labrecque, & Lally, 2012). Each participant nominated the physical location in which they typically ran (or would run in the case of nonrunners). The nominated locations were then used as primes in a subsequent word recognition task (lexical decision). In the task, after being primed with the location in which they typically ran, participants with strong running habits were faster to identify the words *running* and *jogging*. Presumably, their prior running experience had allowed them to develop stronger context–response associations than did weakly habitual runners or nonrunners.

Once habits have formed, they are triggered largely by context cues and tied less closely to motivations and goals. This pattern was demonstrated in Neal and colleagues' (2012) word recognition study. When primed by the goals that they claimed motivated them to run, strongly habitual runners were not faster to identify running words. Instead, the idea of running had become associated with contexts for those with strong habits. However, for occasional runners who were still developing habits, thoughts of motivating goals did bring ideas of running to mind, suggesting that goals are important guides for habit formation.

For many researchers, insensitivity to rewards and goals is a defining feature of habits, and furthermore differentiates habits from more goal-directed responding (e.g., Dickinson, 1985). A standard practice to determine whether a behavior is habitual or goal-directed is to change the value of the outcome of the behavior or change the

behavior–outcome contingency. If people halt a behavior when they do not like the outcome—or the outcome does not occur, then the behavior is considered to be goal-directed. Continued repetition regardless of the outcome, by contrast, indicates habitual responding. In a laboratory study by Tricomi, Balleine, and O'Doherty (2009), for example, participants learned to respond to one image for candy and to a different image for potato chips. After extensive training at this food-choice task, participants ate one of the foods until they were sated, and thereby the attractiveness of this food reward was *devalued*. When tested again, participants continued to make choices to both images, despite the fact that that they reported no longer wanting the food associated with one of the images (see also Gillan, Otto, Phelps, & Daw, 2015; Hogarth, Chase, & Baes, 2012). Thus, participants continued to make the habitual choice, despite that they no longer wanted the food generated by that response.

Outcome insensitivity of habits was also demonstrated in a field experiment that targeted a naturalistic habit—popcorn eating at the movie theater (Neal, Wood, Wu, & Kurlander, 2011). Participants in the study were given a bag of popcorn that was either freshly made or stale. They generally reported disliking the stale popcorn, but this preference only influenced participants who typically did not eat popcorn at the movie theater. Participants with strong popcorn-eating habits consumed almost equal amounts of fresh and stale popcorn. A different picture emerged when participants ate popcorn while watching music videos in a conference room. The unusual setting did not bring to mind popcorn-eating habits that had been acquired in the context of a movie theater. Consequently, when in the laboratory, even participants with strong cinema-popcorn habits were sensitive to the taste of popcorn and ate little of the stale popcorn.

The direct activation of habits by context cues yields a guide to behavior that differs in important ways from other automatic, implicit processes (Evans, 2008). For example, the priming of goals, attitudes, or concepts can activate a range of responses, and is not limited to the repetition of a particular well-learned response (see Wood, Labrecque, Lin, & Rünger, 2014). Even strongly desired goals that stably characterize people's motives do not necessarily yield stability in the particular means of goal pursuit. Instead, goals are marked by *equifinality*, which means that most goals can be achieved through multiple behavioral means. Furthermore, unlike habits, automated goals (e.g., implementation intentions) influence behavior primarily to the extent that they are consistent with people's explicit motivations (Sheeran, Webb, & Gollwitzer, 2005).

In summary, key attributes of habits are that they develop through associative learning as people repeatedly perform actions in daily life. Although goals and rewards are important for habit formation, once context–response associations have formed in memory, the readily available response reduces sensitivity to changes in goals and outcomes of the response. The automaticity behind habit performance differs in a number of features from the more flexible automation of goal pursuit, especially in that habit performance involves repetition of a particular response.

Self-Control Involves Inhibiting Unwanted Habitual Responses

Most research on habits in self-control has broadly followed the conceptualization of a Stroop task in which habits are the incorrect automated response (i.e., reading word

meaning) that participants try to control in order to respond correctly (i.e., reporting font color). If people catch themselves in time, they can inhibit the habitual response. In this antagonistic role, habit performance represents a failure of executive control. The considerable research in this tradition, focusing on habit inhibition and change, is understandable given the potential for bad habits to pose threats to health, happiness, and financial well-being.

Several highly influential models of self-control were built on this approach, in which goal pursuit proceeds through control of habits and other unwanted responses. According to one model, voluntary acts such as self-control draw on a finite resource that is analogous to the folk-psychology concept of willpower (e.g., Bertrams, Baumeister, Englert, & Furley, 2015). In this analysis, people vary in their chronic levels of willpower; in addition, their available levels fluctuate as willpower is depleted with use and replenished with rest. Also relevant to understanding self-control is Metcalfe and Mischel's (1999) classic hot–cool system of impulse control that identified strategies children and adults use to control stimulus-based actions effectively. Although this model emphasized the control of impulsive, emotionally evocative responses, it also identified different control strategies relevant to understanding how unwanted habits are reconciled with goal pursuit.

The different strategies people use to exert self-control were illustrated in experience sampling research of people's everyday attempts to inhibit unwanted thoughts, feelings, and actions (Quinn, Pascoe, Wood, & Neal, 2010). Of the unwanted responses identified in these studies, about 12% were strongly habitual, in that they were performed almost daily and usually in the same context. Another 38% of the responses that participants were trying to inhibit represented temptations that arose from hot, emotional stimuli that would provide immediate gratification but longer-term regret. Given the different cueing mechanisms behind habits and temptations, the spontaneous self-regulatory strategies that effectively controlled one kind of response were not necessarily effective at controlling the other; that is, participants were most successful at resisting temptations when they removed the tempting stimulus or limited their exposure to it (Quinn et al., 2010). By contrast, stimulus control as a self-regulatory strategy provided little traction over unwanted habits. Because habits are often acquired nonintentionally, people frequently lack insight into the causal relationship between context cues and the habitual responses that they trigger. Therefore, the relevant context cues, unlike tempting stimuli, would not be easily identifiable. Instead, participants in Quinn and colleagues' (2010) study were most successful at controlling unwanted habits when they monitored their behavior closely and prevented the unwanted habit response from being elicited. However, even with this *vigilant monitoring* self-control strategy, participants were only moderately successful at suppressing unwanted habit responses.

In summary, the traditional approach to studying habits and self-control involves understanding how people inhibit the performance of unwanted habits in order to meet their long-term goals. Although people are sometimes able to exert this kind of control over their behavior, daily life can work to lock people into habit performance and impede more effortful, controlled attempts to pursue goals. As explained in the next section, people are likely to carry out the habitual response in mind when they lack the motivation or self-control strength to reject that response or to choose an alternative one (or no response).

Habits Persist When People Lack Self-Control

A cottage industry of research has developed to identify the many factors that reduce people's deliberative control over goal pursuit and lead them to fall back on habitual responding. Distraction, cognitive decline with age, time pressure, and limited task ability all tend to impair executive functioning and increase the likelihood of habit performance. For example, for participants performing a probabilistic categorization task, being distracted by simultaneously performing a demanding task increased their use of stimulus–response strategies over rule-based ones (Foerde, Knowlton, & Poldrack, 2006). Distraction also increased habitual responding in a multi-stage decision task (Otto, Gershman, Markman, & Daw, 2013). In addition, older adults and those with lower cognitive control abilities were less able to leverage higher-order goal representations in order to overcome habitual solutions to a variety of tasks (de Wit, van de Vijver, & Ridderinkhof, 2014; Otto, Skatova, Madlon-Kay, & Daw, 2015). In like manner, participants who possessed low spatial perspective-taking ability used more habitual navigation strategies and less goal-directed ones when repeatedly traversing a virtual maze (Marchette, Bakker, & Shelton, 2011). A full review of the many factors that tip the balance toward habitual responding, away from goal pursuit, is beyond the scope of this chapter, and here I provide just a brief review of research on the effects of reduced willpower and increased stress.

Willpower

Many deliberative actions, especially inhibiting a habit and making a decision to act in an alternative way, require willpower. When willpower resources have been drained by previously performing a task that required executive control, people fall back on their habits and other automated responses (Hagger, Wood, Stiff, & Chatzisarantis, 2010; although see Carter, Kofler, Forster, & McCullough, 2015). Reflecting this process, participants who had first performed a demanding task were less able to modify their habitual levels of self-disclosure to suit situational demands (Vohs, Baumeister, & Cicarocco, 2005). Thus, when depleted, participants who typically would not self-disclose fell back into this habitual pattern even when greater disclosure was socially appropriate. This link between diminished willpower and a resurgence of undesired habits is supported by a wealth of empirical data. For example, on days with high self-control demands, underage social drinkers were more likely to become intoxicated and to violate self-imposed limits on their alcohol intake (Muraven, Collins, & Neinhaus, 2002). Importantly, higher self-control demands did not increase participants' urge to drink or lead them to abandon their plans to drink less. This suggests that in their depleted state, people did not acquire new goals, they just had difficulty adhering to their old ones, and thus fell back on their drinking habits.

Depletion boosts performance of not only bad habits that are inconsistent with goals but also good habits that are goal-consistent; that is, depletion may decrease people's motivation and ability to deviate from good habits, just as they do bad ones. When depleted, people might, for example, decide not to vary from a good habit of jogging after work and pass up an opportunity to go to a movie or try something novel, such as a new restaurant that opened in their neighborhood. The tendency for depletion to boost both good and bad habit performance was demonstrated in a quasi-experimental

study in which MBA students made snack choices before or after a difficult midterm examination (Neal et al. 2013). Because completing a difficult examination requires self-control strength, students choosing after the examination fell back on their own habits in selecting the snacks. Moreover, supporting the habit boost for both good and bad habits, depletion increased habitual choices for both healthful (fruit, nuts) and unhealthful (chocolate, cookies) snacks. In another study that manipulated depletion, Neal and colleagues' (2013) participants performed a number of everyday behaviors with their nondominant hand—a task that drains self-control resources because it requires resisting the impulse to use the dominant hand. When self-control was drained in this way, participants were more likely to fall back on performing strongly habitual behaviors, some of which were in line with their personal goals, and others that challenged goals.

Stress

The experience of acute, as well as chronic, stress can increase people's reliance on habits (Schwabe & Wolf, 2013). Stress decreases people's ability to thoughtfully control their actions and thereby boosts habit performance. For example, Schwabe and Wolf (2010) first trained participants to choose either chocolate milk or orange juice in an experimental task. Then they devalued the drink reward by providing participants with as much chocolate pudding or oranges as they wanted—which reduced their desire for the milk or juice (respectively). Although they no longer wanted the relevant drink, participants who had been stressed with a combination of physical and psychosocial stressors (immersing a hand into ice water while being monitored by a stranger and videotaped) continued to choose it habitually. For example, stressed participants trained to choose chocolate milk continued to select it even after eating lots of chocolate pudding. Thus, when stressed, participants fell back on their old habits even when they no longer desired the food reward.

The stress-induced shift toward habits can be traced to the ways that stress impedes deliberate action control. In sequential decision-making tasks, acute stress selectively attenuated goal pursuit and promoted habit performance in vulnerable participants—those with low working-memory capacity (Otto, Raio, & Chiang, 2013) or high levels of chronic stress (Radenbach, Reiter, Engert, Sjoerds, Villringer et al., 2015). Similarly, in a study of visual classification learning, stressed participants were biased toward relying on a habit-linked learning strategy at the expense of explicit learning (Schwabe & Wolf, 2012). These results may reflect simply the breakdown of higher-order decision-making functions under stress, or they may indicate a strategic shift in people's allocation of cognitive resources, so that they fall back on habits and other strategies to prevent unreliable performance.

Along with impeding deliberate thought, stress also might promote habit acquisition. At this point, such a possibility is just that, a possibility. Research with rodents suggests that stress can, under specific conditions, facilitate habit learning (Dias-Ferreira et al., 2009). The evidence of stress effects on human habit learning, however, has been mixed (Guenzel, Wolf, & Schwabe, 2014a, 2014b), and further research is needed to clarify whether habits do form more quickly under stress.

In summary, a variety of moderating factors determine whether people can exert self-control to inhibit unwanted habits. In research designs that pit habitual responses against deliberate goal pursuit, habits predominate when circumstances limit people's capacity

to deliberate about their actions. Specifically, habits are promoted by circumstances that are distracting, reduce cognitive abilities, heighten stress, and deplete willpower. These factors lower people's capacity to inhibit cued, habitual responses and to make decisions to do something else (or nothing at all).

More generally, research in this area highlights that habits can be beneficial in the sense of rescuing performance. Suggesting this functional role, Schwabe and Wolf (2013) reported that stressed participants performed particularly badly when they stopped relying on their habits and attempted to guide their behavior more thoughtfully. Thus, when threat and pressure derail more thoughtful control over action, habits—although not always the optimal response—provide one that can be readily brought to mind and automatically executed.

Effective Self-Control through Habit Performance

Given the challenges people experience with unwanted habits that derail goal pursuit, it is easy to overlook that most habitual behaviors are congruent with people's goals (Ouellette & Wood, 1998). One reason for this congruency is that habits often originate in goal-directed behavior. When a goal persists so that an individual consistently performs the same behavior in a specific context, the conditions are met to render the behavior habitual. Delegating behavioral control to the environment then frees up cognitive resources and provides an efficient way to adhere to recurring self-regulatory goals. In addition, habits provide a ready response in situations that render effortful self-control difficult. Thus, as outlined in the prior section, when people are stressed, distracted, or low in willpower, they can fall back on good habits (Neal, Wood, & Drolet, 2013). Presaging this thinking, William James (1914) recommended, "We must make automatic and habitual, as early as possible, as many useful actions as we can" (p. 67).

Emerging evidence from a variety of research areas supports this idea that habits can promote desired goals. Some suggestive support comes from an experience-sampling study in which participants reported on the desires they felt during everyday life (Hofmann, Baumeister, Förster, & Vohs, 2012). Participants with chronically high levels of self-control experienced desires less strongly, had less motivational conflict, and reported less often having to resist desires. The researchers concluded that people with high trait self-control reduced problematic desires by shaping and selecting their environments in a way beneficial for goal pursuit. That is, self-control operated not through inhibiting unwanted responses but instead "via adaptive habits and anticipatory coping" (Hofmann et al., 2012, p. 1331).

Several recent studies have more directly substantiated the link between trait self-control and habits. For example, participants high in trait self-control had weaker habits to snack on unhealthy foods (Adriaanse, Kroese, Gillebaart, & De Ridder, 2014). Across multiple studies, Galla and Duckworth (2015) discovered that higher trait self-control was related to stronger habits for a range of beneficial behaviors, including exercising, eating healthy snacks, getting adequate sleep, and doing homework. In an especially convincing longitudinal study with adolescents, those with higher self-control were more likely to practice good habits; that is, trait self-control measured before a 5-day mindfulness meditation retreat predicted the strength of adolescents' meditation habits assessed in a follow-up survey 3 months later. This finding further corroborates that self-control

is instrumental for developing good habits, and these habits then automatically promote desired outcomes.

Habits shield against the pull of temptations. One of the ways that habits promote goal pursuit is by arming people against desires that conflict with valued goals. In evidence of this process, Galla and Duckworth's (2015) participants with greater self-control were less likely to report effortful inhibition of temptations that ran counter to the beneficial behaviors under investigation. Crucially, habit strength mediated the link between high self-control and the reduced experience of temptations. This latter finding corroborates Hofmann and colleagues' (2012) hypothesis that people with good self-control develop adaptive habits that insulate them against motivational conflicts and problematic desires.

More direct evidence that habits shield against temptations comes from Lin, Wood, and Monterosso's (2015) research showing that the choice between a healthy and an unhealthy snack can be habitually biased toward the healthy alternative. In one study, participants made food choices by moving a joystick to one image to win baby carrots and to a different image to win potato chips. After the initial training phase, participants performed a cognitively demanding task that was designed to reduce self-control capacity and increase reliance on habits. Participants then completed a new choice task that pitted the habitual foods against other, novel foods. Thus, they chose between baby carrots and M&Ms or between potato chips and popcorn. The key manipulation was whether these choices were made in the presence of the habit pictorial cue from the training phase or a novel image. As predicted, the presence of a habit cue increased the likelihood of choosing the associated outcome, so that participants continued to make the habitual response. Thus, they made the healthy habitual choice of baby carrots over M&M's, as well as making a less healthy habitual choice of potato chips over popcorn. This study then indicates that people with healthy habits automatically make the beneficial choice even when tempted to act in less healthy ways.

Mechanisms by Which Self-Control Promotes Habit Performance

An important challenge for future research is to uncover the psychological mechanisms that link higher self-control with beneficial habits. Some insight comes from a recent meta-analysis of task performance (de Ridder, Lensvelt-Mulders, Finkenauer, Stok, & Baumeister, 2012). Specifically, trait self-control was more strongly related to behaviors classified as automatic (e.g., habitual condom use) than to those deemed controlled (e.g., quitting smoking). This was true for both desired and undesired behaviors. In other words, people with strong self-control excelled at developing good habits, as well as at breaking bad habits. It may be, then, that self-control guides the initial formation of desired habits. When people set out to acquire a new routine behavior (e.g., going to the gym every other day), high levels of self-control might shield the new behavior against conflicting impulses and motivations, along with the cueing of old, unwanted habits. Consistent with this idea, some studies indicate that people high in conscientiousness are especially adept at habit formation (e.g., Vishwanath, 2015). If they enact a new desired behavior more frequently and regularly, then it is more likely to become habitual over time.

In daily life, self-control might also promote habit formation and performance by guiding self-selection into contexts likely to cue desired behaviors. For example, healthy people (with a low body mass index [BMI]) appear to choose their homes in part based

on opportunities to exercise, and these environments in turn promote healthy behaviors (Plantinga & Bernell, 2007). Thus, home-buyers with lower BMIs were more likely to prefer to move to a pedestrian neighborhood, and moving to a more walkable neighborhood tended to protect against weight gain (Eid, Overman, Puga, & Turner, 2008). Individuals with lower BMIs were also more likely to own a dog, especially one that they walked themselves (Coleman et al., 2008). Although this research did not directly assess self-control, it demonstrates the power of our living environments to shape behaviors that promote desired outcomes—or the reverse. An interesting question for future research is whether people with high self-control are especially likely to select into contexts that promote desired outcomes.

Another possible mechanism explaining the relation between self-control and habit performance in daily life is that high self-control enables people to structure their immediate environments to cue desired habits. For example, the homes of normal weight (vs. obese) preschoolers provided more opportunities to act in healthful ways (e.g., accessible fresh vegetables, physical activity options, children's bedrooms without TVs; Boles, Scharf, Filigno, Saelens, & Stark, 2013). Also, patrons with lower BMIs at all-you-can-eat Chinese buffets limited consumption by using chopsticks and putting napkins on their laps, along with sitting with their sides or backs to the buffet (Wansink & Payne, 2012). Although this research did not directly assess self-control, it is consistent with the idea that people shape the contexts in which they live and may thereby automate behaviors that lead to desired outcomes.

In summary, by automating behavior into habits, people can achieve goals reliably and with little effort. Those who are effective at self-control especially appear to meet their goals in this way. Greater self-control might enable people to form new habits successfully, as well as to shape and choose their environments to cue desired responses.

Inferring Self-Regulatory Goals Consistent with Habits

In this chapter I have argued that successful long-term self-regulation involves habitually engaging in actions that correspond with valued long-term goals. Specifically, people exert self-control to inhibit unwanted habits, and they repeat goal-directed actions in stable contexts so as to form desired habits. In this section, I argue further that habits interface with self-regulatory goals through the inferences that people make about their habitual behavior (Wood & Rünger, 2016).

People often have to infer the reasons why they perform habitual behaviors. Despite awareness of the performance of many everyday habitual responses—the route they take to work, the last time they brushed their teeth—people are largely unaware of the cueing mechanism that activates habits. Given this limited introspective access, they are in the position of generating explanations for habitual responses post hoc. According to classic social psychology theories, in cases when internal cues to action are weak, ambiguous, or uninterpretable, people infer what their motivations must be from observing their behavior and external cues (Bem, 1972). The simple frequency of habit performance, however, might lead to erroneous inferences of strong, consistent motives. Suggesting this pattern, participants with stronger habits were more certain about their behavioral intentions and perceived the behavior as guided more by their goals than did those with weaker habits, when in fact the opposite was true—intentions and goals were particularly

poor predictors of strongly habitual behaviors (Ji & Wood, 2007; Neal et al., 2012). Such inferences were also evident among Armitage's (2005) new gym members mentioned at the beginning of this chapter. The more that participants went to the gym during the 3 months of the study, the more that their intentions to exercise increased in favorability and their judgments of behavioral control strengthened (holding initial intentions and control constant). This is interesting because, after the fifth week of the study, intentions became epiphenomena and were not predictors of gym attendance. Nonetheless, inferences that goals motivate habit performance may be correct in a historical sense because people may accurately remember the goals that initially guided habit formation.

People make inferences about potential goals that motivate a range of habits, even habits of addiction. According to Everitt and Robbins (2005), addicts' experiences of compulsively wanting a drug might not be a precursor of consumption but a post hoc rationalization of drug-use habits. Similarly, obsessive–compulsive disorders may originate in excessive habit formation. In this view, irrational beliefs about threats are inferred as a consequence of a compulsive reliance on habits (Gillan & Robbins, 2014). Although people appear to infer intentionality in this way for a wide variety of habits, sometimes such inferences are not plausible. When a habit is clearly inconsistent with current goals, people might just label the inconsistency and not infer a corresponding motive (e.g., explaining, "I can't help it; it's just a habit").

Goal inferences are sparked by not only the simple frequency of habit performance but also the positive affect associated with many habits. Habits are likely to be favored due to the ease with which they can be performed in comparison with alternatives. As an illustration, consumers appear to value using existing products and services over new ones because of the difficulty of mastering new skills (e.g., Murray & Häubl, 2007). Habits also are likely to be viewed positively due to the fluency, or speed and ease of processing, associated with frequently performed behaviors. High fluency is experienced as positive in part because it signals familiarity over uncertainty and success at processing and understanding, and this positive affect generalizes to current activities (Reber, Schwarz, & Winkielman, 2004). Habit inferences thus exploit a psychological calculus that favors what feels easy because it is well practiced over what feels more difficult because it is new. Being favorably disposed toward habits for these reasons, people might plausibly infer that they intended to perform the response.

Although the inferences that follow habit performance may not be accurate descriptions of the mechanisms generating action, inferences about habits may contribute to well-being. Repeated behaviors, such as students' choice of the same seat in a classroom, heighten their feelings of comfort, confidence, and control, despite the fact that these choices initially might have been largely random (Avni-Babad, 2011). Furthermore, Heintzelman and King (2014) argued that habit performance promotes coherence or comprehensibility of experiences and therefore enhances meaning in life.

In summary, self-regulation of habits, even habits of addiction, may proceed as a result of people shifting their goals and intentions to be consistent with the habits they perform. Although the inference that a habitual behavior was intended is largely erroneous in terms of psychological processes, these inferences have an intuitive plausibility for high-frequency behaviors. Such inferences are further promoted by the switching costs of deviating, the fluency of habit performance, and the potential benefits of habit performance for well-being.

Conclusion

In this chapter, I have outlined three ways that habits contribute to self-control. The first, traditional view is that people exert self-control in order to inhibit unwanted habits and pursue desired outcomes. Considerable time and money have been devoted to programs designed to increase self-control over poor lifestyle habits, addictions, and compulsions, so that people can purposely guide their behavior. Yet emerging research suggests a second approach in which habits often promote goal pursuit and are furthermore an especially effective means of self-regulation for people who are good at achieving desired goals. This line of thinking opens new avenues for behavior change interventions that encourage the formation of new, desired habits. In a third process, habits influence self-regulatory goals as people observe their own repeated behaviors and infer that they must have been intended, which is further augmented by the positive feelings that habit performance can generate. Through these multiple psychological processes, self-regulation is intrinsically intertwined with habitual responses in which control has been outsourced onto the context cues contiguous with past performance.

Although in this chapter, behavior has been termed either habitual or goal-directed, this is actually an oversimplification. In reality, habits integrate with goal pursuit in guiding behavior. Most actions probably reflect aspects of habitual responding, as well as more goal-directedness (Wood & Rünger, 2016). The integration of habits and more goal-oriented behaviors provides a number of advantages for action control. Perhaps most importantly, habit knowledge does not shift readily and is therefore retained even when people change their goals and plans. Also, by outsourcing action control to environmental cues, people have a ready response when distraction, time pressure, lowered willpower, and stress reduce the capacity to deliberate about action and tailor responses to current environments. Furthermore, although people might believe in the effectiveness of effortful goal pursuit over relying on habits (Carden, Wood, Neal, & Pascoe, 2016), habit systems are also smart. By acting habitually, people efficiently capitalize on environmental regularities, even ones of which they may not be consciously aware.

I conclude with a caveat regarding the insight that good habits are an efficient, reliable means of achieving enduring goals. Although repetition intensifies action tendencies so that good habits become even stronger action tendencies, repetition also promotes habituation of experience so that emotional responses diminish (Wood, Quinn, & Kashy, 2002). Weakening unpleasant experiences associated with goal pursuit is of course a good thing—dulled experience of that last mile of running is probably beneficial to the pursuit of fitness. However, weakening of positive experiences, such as dinner with a loved one or an afternoon at the beach, does not contribute to overall life happiness. Thus, wisdom in goal pursuit is knowing what to automate habitually, along with subdued feelings, and what to experience thoughtfully, savor, and enjoy.

Acknowledgments

This chapter was made possible through the support of a grant from the John Templeton Foundation. The opinions expressed in this publication are my own and do not necessarily reflect the views of the John Templeton Foundation. I thank Michael Ohno for his help in preparing the references.

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