Chapter 22
Progress and Prospects in Habit Research

Sheina Orbell and Bas Verplanken

The renewed vigour with which the concept of habit, and habit antecedents, mechanisms and consequences are being studied is demonstrated by the diverse topics brought together in this volume. In this concluding chapter, we reflect upon progress and prospects in relation to three issues that are at the centre of habit theorising and research; the relationship of habit to goals and motivation, the measurement of habit and the relationship of habit to constructs of willpower and self-control.

Motivation and Habit

The relationship of goals and motivational processes to the development, maintenance and undoing of habits is perhaps one of the most debated issues throughout the chapters presented in the book. These issues might be summarised as concerning: (a) Is motivation necessary for the development and execution of habit? (b) Is goal independence a defining feature of habit? (c) Are goals necessary to suppress habits?

Is motivation necessary for development of habit? Evidence for habitual control of behaviour in everyday life comes largely from longitudinal (correlational) studies of extant behaviours in which the impact of intention on behaviour is attenuated in circumstances where an individual has repeatedly performed behaviour in stable contexts in the past (Ouellette & Wood, 1998). This relationship has not been consistently observed, and recent analyses suggest that the relationship of intention to

S. Orbell (✉)
Department of Psychology, University of Essex, Essex, UK

B. Verplanken
Department of Psychology, University of Bath, Bath, UK
e-mail: B.Verplanken@bath.ac.uk

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behaviour might be better viewed as quadratic, such that initially, intention is a relatively weak predictor of a novel behaviour (cf. Orbell & Sheeran, 1998), acquires improved predictive ability over time as a consequence of increased intention stability/strength and then reduces in predictive ability as the behaviour is repeated in a stable context and acquires the characteristics of habit (Sheeran, Godin, Conner, & Germain, 2017, but see also Chap. 21 in this volume). Habit discontinuity studies of naturally occurring context changes find that participants continue to act in line with goals, so long as they continue to live in the same context (Verplanken, Walker, Davis, & Jurasek, 2008; Wood, Tam, & Witt, 2005; see also Chap. 11 in this volume). The inference is that habits develop as a consequence of intended behaviour in the past that has been repeatedly performed in stable cue contexts. Once formed, habits are performed with limited active influence from motivations. Animal learning research similarly employs reward paradigms in order to build habits; specifically, in animal studies extended training at a task such as maze running or lever pushing for a reward produces habitual behaviour that persists even after the reward is devalued (i.e. the animal is satiated or the food is rendered unpleasant) (Adams, 1982). Indeed it might be argued that all experimental manipulations of habit require participants to pursue a goal, even if that goal is merely to follow experimenter instructions in order to complete the experiment and obtain credit. However, habits can be acquired in everyday life by accidental but consistent pairing of action with context (Skinner, 1938) and some recent experimental paradigms have trained habits to cues via an incidental pairing of cues (e.g. Lin, Wood, & Monterosso, 2016). In some circumstances that are prime candidates for habit formation interventions, it is precisely the lack of motivation that necessitates the formation of a habit. For example, patients with serious yet asymptomatic conditions requiring routine medication fail to adhere because they do not feel unwell. Lack of symptoms undermines motivation to medicate in a prophylactic manner (Orbell & Phillips, in press). Passing action control to habit cues may bypass this difficulty.

The true relationship of habit to declarative intention may also be obscured by evidence that people make goal inferences for their habits. Adriaanse, Kroese, Weijers, Gollwitzer, and Oettingen (2018) provide preliminary evidence that people confabulate (make up reasons for their unexplained behaviour without intent to deceive and without knowing that the claim is ill-grounded) when induced to behave, without conscious awareness, in ways that are inconsistent with current goals or values. Because habits operate by mechanisms of which an individual may be unaware, and people may be unaware of the cues that trigger behaviour, people have a tendency to own their habits, particularly their positive habits and to describe them as intentional (e.g. Wood & Rünger, 2016; see also Chap. 2 this volume).

Habits may form as a consequence of goal intentions, or be consistent with goals in the past. They may also be misattributed to goals. In this case, measures of habit that reply upon self-reports may in fact underestimate the extent to which behaviour is controlled by cue–response associations in memory. Inference may also stretch to instances where an undesired habit, such as eating chocolate biscuits when watching television is cued and runs off smoothly, in contradiction to an intention to diet (e.g. Verplanken & Faes, 1999). In these instances, lack of access to the cue

contingency might lead an individual to incorrectly infer some other cause such as stress at work and consequently fail to gain traction on his actual food habit cues.

Is goal independence a defining feature of habit? Contemporary accounts of habit in neuroscience research show that brain systems activated during performance of cue–response habits is localized in the sensorimotor loop, whereas control of goal-directed actions is localized in brain regions in the associative loop (e.g. Tricomi, Balleine, & O'Doherty, 2009; Yin & Knowlton, 2006). Thus, while habit formation may originate in activation of networks concerned with planning and executive function and goal-directed behaviour, neural activity shifts from these networks to those concerned with performance, and behaviour becomes 'locked in'. Importantly, these different neural networks associated with goal-directed and habit behaviour operate in competition, so that during habit performance, goal based systems are suppressed. This idea, that habit performance relies upon specific behaviours brought to mind by cues, which may include previous actions in a behavioural script sequence, stands in contrast to the ways in which attitudes and goals guide behaviour. Even automatic goal pursuit, in which goals are activated and guide behaviour outside of conscious awareness, can produce a range of possible actions associated with the goal. While experiments in this field may examine a specific behavioural outcome of interest, nonetheless an alternative behavioural outcome might have been equally substituted to demonstrate the same process of goal pursuit. Additionally, implicit goals become inactive once satisfied (Aarts, 2007), whereas habits will run on following satiety or devaluation. Habits contrast with this flexible pattern of responding characterised by motives. In an experiment that demonstrated the independence of motives and habit, Neal, Wood, Wu, and Kurlander (2011) manipulated both motive to eat popcorn (fresh vs. stale) and popcorn eating context (cinema vs. meeting room) while participants with strong and weak cinema popcorn eating habits ostensibly rated film clips. Participants with strong popcorn eating habits ate just as much of the stale as the fresh popcorn, but only when in the cinema context. Thus, habitual behaviour persisted in conflict with a devalued attitude toward popcorn *when* the habit context cue was present, but not in a different cue context. Similarly, changes in monetary incentives failed to change response habits in a game, so that people continued to make a habitual choice even though it was no longer rewarded (Gillan, Otto, Phelps, & Daw, 2015). Eating a food to satiety did not deter participants from choosing that food when it was their habitual choice (Tricomi et al., 2009). Trafimow (Chap. 21, this volume) also wonders if his action slip in the form of an accidental driving left turn while not intending to go to work might be due to priming (by perception of the junction) of an implicit goal to get to work. Neal, Wood, Labrecque, and Lally (2012) showed that people with strong habits do not have speeded response latency to primed motives they *believe* guide their actions. Trafimow's desire for a purposeful explanation of his mistake, may lead to confabulation of a logical reason, as opposed to recognition that this turn was merely one in a sequence that makes up the behavioural script for driving to work. Once the script was initiated, it continued, perhaps because he gets into his car and begins a certain route sequence most repeatedly when driving to work.

While many habits are single acts, or repeated single acts (eating popcorn, crisps, biscuits, cigarette smoking), many are behavioural scripts involving multiple actions, each cued by the previous action. Once the sequence has begun, it will run on. Behavioural scripts are overlearned habit sequences. They characterize many features of daily life, including not only the routes we take frequently, but skills we possess such as making a cup of coffee, dressing ourselves, making sushi, or behaviours that are prescribed by our social environment or culture (e.g. Abelson, 1981). These scripts are outside of our conscious awareness, we may not be able to consciously articulate the steps they comprise without great difficulty, yet we perform them automatically. If they are interrupted—consider for example being stopped halfway up the staircase at home—we sometimes have difficulty reinstating them after they become conscious, and may find it easier to return to the bottom and start again because the number of motor actions required to climb a flight of stairs is so habituated that stopping at the top is automatic, and rarely involves an extra false step, or trip. This scripted nature of habits confirmed by neuroscience, is particularly helpful in times of stress—consider a rabbit returning to a warren when under threat, or a soldier following orders, or undertaking a sequence of actions to arm his gun whilst under fire. The distinction between instigation and execution habit suggested by some authors may be a false dichotomy (Phillips & Gardner, 2016). Whether an individual 'ought to' jog down the street or drive to work without conscious awareness is not the point. The point is that people often do. Who would wish to admit that he or she just arrived at work and parked but does not recall the journey? If jogging on the street is always accompanied by conscious control—car drivers would not need to be on high alert for joggers who show no awareness of what is going on around them and who are often wearing headphones, or even speaking on a headset phone. Interestingly, gyms are often walled with mirrors. Their purpose might be to correctly execute exercises, but social psychological research tells us that self-awareness is promoted by mirrors in the environment and can facilitate conscious control of action (Dijksterhuis & van Knippenberg, 2000).

Are goals necessary to suppress habits? Evidence that habits and goal-directed behaviour are controlled by different neural networks poses a fundamental difficulty for undoing habits (Graybiel & Smith, 2014), because it seems that the 'imprinted' cue–response associations and scripts associated with established habits cannot be undone. Anecdotally, many an ex-smoker, even one who ceased smoking 20 years previously, and experiences no cue prompted desires to smoke in almost all contexts, can still experience the impulse to smoke in certain cue contexts, when seriously ego depleted, or even in dreams. A single lapse, or enactment of the cue–response association, can quickly re-establish the habit. A great deal of research across multiple behaviour types, shows that merely implementing interventions to modify attitudes or intentions, is relatively ineffective in changing habit behaviour (e.g. Webb & Sheeran, 2006). For example, persuasive appeals that changed preferences for soft drinks failed to change the drink choices of people with strong soft-drink habits (Itzchakov, Uziel, & Wood, 2018). Habits are a powerful source of behavioural change resistance.

On the face of it, constant and demanding goal self-regulation, that is itself ego depleting, may be required to combat strong habits. One approach proposed to support goals that are counter-habitual is the formation of implementation intentions (Gollwitzer, 1993, 1999). Implementation intentions are consciously implemented goal-directed self-regulatory strategies that supplement goal intentions ('I intend to do Z'). They take the form 'If I encounter context/cue X then I will perform behaviour Y' in the service of the goal-directed behaviour. These if-then plans link context opportunities to action so that opportunity to act is not missed. In the context of overcoming habits, so long as an individual can correctly identify the existing cue for his or her unwanted behaviour, it may be possible to form an implementation intention to replace an unwanted habit (eating crisps when watching television) with a plan to eat fruit when watching television, for example. Studies that have explored the utility of these strategies for overcoming habits show limited evidence of effectiveness, in part because a plan to respond to a cue in a different manner than prescribed by habit creates an opportunity for conscious control of action but does not make the novel response more accessible than the old one (Adriaanse, Gollwitzer, De Ridder, de Wit, & Kroese, 2011; see also Chap. 10 this volume). Plans to respond by attempting to negate a habit cue–response ('If I encounter stimulus X I will tell myself not to do Y') either reactivate prior associations between cue and response Y, or maintain perceptual readiness to perceive a habit cue. Plans to ignore cues ('If I encounter cue X I will ignore it') may be more effective in breaking habits, but little research has been conducted in samples where evidence has been provided of prior strong habits, or with adequate follow up to substantiate effects.

Habit reversal theory (Azrin & Nunn, 1973) developed to treat habits such as hair pulling, nail biting and skin picking suggests a number of strategies that, together have clinical effectiveness (see also Chap. 9 this volume). Strategies include development of cue and response awareness via monitoring, and description, and detection of early signs that a response is occurring, training an incompatible response and enhancing motivation for behaviour change.

A novel approach might be afforded by training new habits that rely less on the mobilization of conscious goal regulation, but employ habit architecture to acquire new habits. Just as research is beginning to suggest ways in which environmental primes might be employed to create 'choice architecture' that nudges people to enact their goals (e.g. Marteau, Hollands, & Kelly, 2015), so 'habit architecture' may be employed to nudge people to enact new habits. A new habit can simply override an old one. For example, developing a new habit to go to the gym after work can effectively inhibit the old habit of going to the pub after work. Or a new habit of walking to work can effectively inhibit an old habit of driving to work. Habit discontinuity theory takes a different approach that relies upon context change. Because habit is context dependent, changing contexts serve to disrupt habit and create opportunity for change (e.g. Verplanken et al., 2008; Verplanken & Roy, 2016; Verplanken & Wood, 2006; see also Chap. 11 this volume).

Progress and Prospects in Habit Measurement

Habit crosses interdisciplinary boundaries perhaps more so than any other psychological phenomenon, and habit research employs a wide range of methodologies and research paradigms. This breadth has enriched the field and convergent evidence across disciplines leads to the conclusion that habit cannot be ignored. Habits exist and can be identified in specific patterns of brain activity, in evidence of associations in memory, in action slips made in a cue context when goals are in opposition, and in the experience of having acted without realising or intending it. Table 22.1 summarises these various approaches to identifying habit that are discussed in this book and elsewhere in the literature. We take stock on the adequacy of current methods and consider how research efforts might be progressed.

Measures developed for different purposes possess different qualities. In other words, different measurement types reveal different slices of a habit reality. There is no single paradigm or method by which to assess the existence of a strong habit and in some ways habit theory has advanced beyond current measures. Research that seeks to evidence habit mechanism relies upon establishing a strong cue–response association in memory or manipulates the association via training. Behavioural slip paradigms evidence habit when counter-intentional behaviour occurs in the presence of a cue. Neuroscience paradigms evidence habit via concurrent activation of brain regions concerned with motor, rather than reflective goal and planning related functions. Self-report measures either represent the conditions conducive to habit formation (high past behavioural frequency in a particular context) or the experience of habit.

Relatively little research has examined the co-occurrence of these measures. For instance, Galla and Duckworth (2015) reported a 0.53 correlation between the Frequency-in-Context measure (e.g. Ji & Wood, 2007) and the Self-Report Habit Index (Verplanken & Orbell, 2003). The Self-Report Habit Index is also correlated with the Response Frequency measure (Verplanken, Aarts, van Knippenberg, & van Knippenberg, 1994), attentional bias to habit cues consistent with perceptual readiness to detect habit cues, and longitudinally to behavioural slips in context after response devaluation (Orbell & Verplanken, 2010). Frequency–in-Context correlated significantly with speeded response latency in identifying habits following context primes (Neal et al., 2012).

No measure of self-reported habit has been directly validated against external evidence of efficiency, non-intentionality, unawareness, and uncontrollability (Bargh, 1994). However, self-reported lack of awareness is relied upon in a good deal of priming research concerning non-conscious activation, albeit in conjunction with minimal stimulus exposure times that are preconscious (Bargh & Chartrand, 2014). As a consequence, it cannot be concluded with confidence that self-report measures do not tap a sense of fluency and ease of performance, as opposed to habit or, when a history of repetition is not assessed, ease of goal-directed activity. Paradigms employing response devaluation may fail to distinguish between habitual control of action and deficits of goal-directed control because slips may occur as

Table 22.1 Habit measures

Measures based on observations	Definition and example
Behaviour observations	In situ observations of behaviour. Studies using behaviour observations implicitly or explicitly equate habit and behavioural repetition. For example, studies on interventions to promote handwashing aim at establishing handwashing habits, which may be assessed by observing the behaviour (e.g. George et al., 2017)
Response latency paradigms	An implicit measure that infers automatic cognitive accessibility of cue–response associations in memory from reaction time. For example, following a cue prime (e.g. park), participants complete a lexical decision task. Strong habits are indicated by shorter response latency to habit words (e.g. running) (e.g. Neal et al., 2011, 2012)
Attentional bias (e.g. Stroop)	An implicit measure that infers automatic habit cue detection from interference (greater response latency) in a Stroop task (e.g. Orbell & Verplanken, 2010)
Action slips and devaluation paradigms	Devaluation paradigms infer habit when an overlearned response to a cue usually acquired in the presence of a reward subsequently persists even when the reward is devalued or is no longer contingent on the behaviour (extinction). The defining feature of habit in animal models. Action slips refer to the responses made following devaluation and refer to observed behaviour in response to a cue that no longer has instrumental value (e.g. Orbell & Verplanken, 2010; Tricomi et al., 2009)
Response frequency measures	Habit may be indicated by the speed with which decisions are being made. Verplanken et al. (1994) developed the Response Frequency measure of habit. Participants are presented with multiple choice scenarios, and are instructed to respond as quickly as possible to each scenario. The prevalence of one particular choice option across the scenarios is taken as a measure of habit. The time pressure is an essential element in this measure
Lever pushing	This method is predominantly used in animal studies on habit, such as reinforcement training in mice (e.g. Rossi & Yin, 2012)
Neuroimaging	Observations that habitually performed behaviours activate brain regions and neural networks associated with the sensorimotor loop, that is distinguished from those neural networks associated with planning and goal-directed behaviour (e.g. Lehéricy et al., 2005)

Measures based on self-reports	Definition and example
One item self-reported frequency	Retrospective reports of past performance frequency. These have been widely used in social, health, and consumer psychology research. The may have the format 'How often did you perform behaviour X in the last month', accompanied by a scale ranging from 'never' to 'always'
One item self-reported habit	Self-perceptions of habitual performance (Performing behaviour X is something I do by force of habit; e.g. Mittal, 1988)
Frequency in context	Retrospective reports of performance frequency (how often is the behaviour performed) with a measure of context stability (how stable is the performance context). Habit strength is the product of the frequency × context stability terms so that behaviours that are performed often and always in the same cueing context are considered habitual (e.g. Ji & Wood, 2007)

(continued)

Table 22.1 (continued)

Measures based on self-reports	Definition and example
Self-Report Habit Index (SRHI)	Self-perceptions of habit performance comprising 12 items assessing performance repetition, automaticity and self-identification with action (e.g. Performing behaviour X in context Y is something I do….before I realise I am doing it) (e.g. Orbell & Verplanken, 2010, 2015; Verplanken & Orbell, 2003). Gardner, Abraham, Lally, and de Bruijn (2012) dubbed four items of this scale the Self-Report Behavioral Automaticity Index
Habit Index of Negative Thinking (HINT)	Self-perceptions of habitual thinking. This scale is conceptually identical to the Self-Report Habit Index, but six items were reworded to accommodate assessment of mental habits (see: Verplanken, Friborg, Wang, Trafimow, & Woolf, 2007). The scale can be applied as 'stand-alone', similarly to the SRHI. But it can also be used to refer to previously generated thoughts, for instance in a thought-listing task. In that case, the generated thoughts represent the content of thinking, while the HINT represents the habitual quality of thinking
Creature of habit scale	A trait measure of individual differences in habitual responding in everyday life, comprising routines and automaticity in a variety of domains (Ersch, Lim, Ward, Robbins, & Stochl, 2017)

much from the latter as from the former when new contingencies are introduced (Watson & de Wit, 2018).

Defining features of habit, namely cue dependence and repetition history have been neglected in a great deal of correlational research seeking to examine the role of habit in predicting behaviour (Gardner, 2015). Neglect of repetition history in order to avoid method variance with self-reported future behaviour is a weakness that should be rectified by employment of objectively observed behaviour in research design, not by neglect of measurement of repetition. Neglect of cue-context dependency seriously undermines claims of habit, since a good deal of behaviour might be frequent and possess a sense of automatic responding without being a habit. Neglect of *both* cue-context and repetition history substantially undermines claims of habit measurement. Objectively observed behaviour in contexts previously associated with habit, or increased sensitivity to outcome/reward are more relevant measures of intervention success in this case. Ecological momentary assessment may enhance study of habit in context. Relatedly, outcome measures need to evaluate behavioural outcome in context, or employ non-behavioural outcomes of habituation such as weight loss.

We would contend that future research needs to focus on paradigms that illustrate the operation and formation of habit as well as its consequences. In particular, more attention needs to be given to experimental manipulation, observation of *both cue context and response, as well as insensitivity to reward or outcome.* For example, a self-report measure of habit such as the SRHI should show development of habit strength in a context or in response to a cue in which a new habit is acquired, but should not show corresponding development in a different context. Similarly, studies designed to observe diminishing habits or to intervene to diminish habits need to demonstrate that the habit has declined in response to cue-context

environments previously associated with habit, or that previously habitual behaviour previously has become outcome dependent. Fundamentally, evidence of habit is provided by observation that habitual actions are performed even when the action has no instrumental value, provided the context cue is present. When these conditions are not met, behaviour might be said to be under motivational control.

Habit, Willpower and Self-Control

Habit, by which means it is possible to act without conscious control, stands in stark contrast with notions of willpower that involve the individual exerting conscious self-regulation of behaviour, by actively pursuing goals or by the employment of self-regulation strategies. Indeed the intersection of intentional and habitual control of action is at the heart of modern social psychological theorising about habit.

Yet emergent evidence raises a paradox- namely- suggestions that self-control might be associated with a greater tendency to create habits (Adriaanse, Kroese, Gillebaart, & De Ridder, 2014; Galla & Duckworth, 2015). The paradox arises because self-control represents a class of executive control processes including response inhibition, that require active and effortful self-management. How can this paradox be resolved? We would contend that the answer may lie in examination of self-report measures of self-control, and in assumptions made about the ways in which self-control guides behaviour.

Self-report measures of self-control require people to respond to items such as 'I refuse things that are bad for me', 'I am good at resisting temptation', 'People would say that I have iron self-discipline' and to reverse coded items such as 'I am lazy', 'I have trouble concentrating' and 'I wish I had more self-discipline'. On the face of it these items have validity in assessing self-perceptions of employment of self-regulatory resources to inhibit undesired responding (resisting temptation). Yet Hofmann, Baumeister, Forster, and Vohs (2012) showed in an experience sampling study, that people reporting high state self-control actually *resist fewer* temptations in daily life. Imhoff, Schmidt, and Gerstenberg (2014) report a negative correlation between trait self-control and impulse inhibition in daily routines. One possible interpretation of these findings is that people who are high on trait self-control in fact avoid situations of temptation, so that the effect of self-control on goal achievement and behavioural outcomes rests in the employment of strategies to proactively avoid temptation before it occurs, thereby avoiding the ego depleting consequences of reactive inhibition in daily life. Consistent with this possibility Miles et al. (2016) obtained no evidence that extended *inhibition training* resulted in improved self-control, reduced ego depletion effects or attenuation of the habit-behaviour relation. Their participants did, however, believe that they had improved their self-control during the training. These findings have led researchers to suggest, and to provide correlational evidence that trait self-control is positively correlated with habit. For example, Galla and Duckworth (2015) showed that trait and specific self-control were moderately positively correlated with behavioural habits and that both of

these constructs were inversely associated with effortful inhibition and positively associated with a range of behaviours. Examination of self-control items shows that it is entirely plausible that an individual with an established healthy eating habit, or rigid exercise or studying habit might respond affirmatively to items such as 'People would say that I have iron self-discipline'. The scale assesses the outcome of self-control rather than the process by which it operates and individuals with strong habits who perhaps have little insight into the mechanisms that maintain their habits might also infer that they are good at resisting temptation or distraction (similar to the ways in which people infer intentionality or confabulate reasons for their actions). Resisting temptation or being perceived as high in self-discipline are likely valued self-descriptions. There may be plausible routes by which self-control may be related to behaviour via habit. One route is effortful and self-regulated but operates via avoidance of temptation rather than via exhausting active resistance and focus on temptations. This is consistent with observations that strategic automatization of plans to ignore tempting stimuli are effective in goal achievement (see chap. 10, this volume). However, Galla and Duckworth (2015) showed that both self-control and behavioural habits were inversely associated with attempts to ignore stimuli, so it cannot be concluded that they had acquired habits to ignore distracting stimuli.

Habits are not controlled by effortful resistance or conscious cue avoidance. However, pre-existing habits can protect against situational interference and proximal low self-control (Neal, Wood, & Drolet, 2013). Recently, Lin et al. (2016) reported an experiment in which participants with limited executive control responded to a self-control dilemma (a choice between M&Ms and carrots) by choosing carrots if the previously learned carrot cue (but not a novel cue) was present in the perceptual environment. It would appear that a strong cue-habit response (choosing carrots) can occur under circumstances when it is not possible to avoid perceiving a tempting alternative (M&Ms) and even when self-control is low, provided a cue to desired behaviour has been trained. If behaviour is under cue habituated automatic control, environmental cues (habit architecture) can provide a shield against temptations. For example an individual may have a habit to do homework as soon as returning home from school that effectively inhibits a temptation to watch television. Habit operates independently of motivational state or concurrent effortful control.

Conclusion

This volume highlights two sides of the habit coin. One the one hand, habits are portrayed as rigid structures, which prevent flexible and creative responding, and, if unhealthy or dysfunctional, may lead to sub-optimal or even harmful conditions. Those are the habits we wish to combat and change. On the other hand, we have habits that are useful devices, which make life easier, enhance performance, protect

against temptation and create enduring behaviour change. Those are habits we wish to obtain and make part of our self-regulatory toolbox.

To complete William James' (1887) quotation provided at the front of the book: 'Full half the time of such a man [i.e. whose only habit is indecision] goes to the deciding, or regretting, of matters which ought to have been so thoroughly ingrained in him as practically not to exist for his consciousness at all' (p. 447). James' remarkable insights, often delivered in a typically baroque style, have been realised via convergent evidence across disciplines showing that habit is a distinctive as well as an intriguing construct that accounts for a substantial proportion of non-consciously activated behaviour in daily life.

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