



# Creature of Habit: A self-report measure of habitual routines and automatic tendencies in everyday life



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## ABSTRACT

Our daily lives involve high levels of repetition of activities within similar contexts. We buy the same foods from the same grocery store, cook with the same spices, and typically sit at the same place at the dinner table. However, when questioned about these routine activities, most of us barely remember the details of our actions. Habits are automatically triggered behaviours in which we engage without conscious awareness or deliberate control. Although habits help us to operate efficiently, breaking them requires great effort. We have developed a 27-item questionnaire to measure individual differences in habitual responding in everyday life. The Creature of Habit Scale (COHS) incorporates two aspects of the general concept of habits, namely *routine* behaviour and *automatic* responses. Both aspects of habitual behaviour were weakly correlated with underlying anxiety levels, but showed a more substantial difference in relation to goal-oriented motivation. We also observed that experiences of adversity during childhood increased self-reported automaticity, and this effect was further amplified in participants who also reported exposure to stimulant drugs. The COHS is a valid and reliable self-report measure of habits, which may prove useful in a number of contexts where discerning individuals' propensity for habit is beneficial.

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## 1. Introduction

Global challenges such as poverty, obesity and climate change require large parts of the general population to change the way we behave in order to make steps towards addressing these problems. Thus far, educational approaches and attempts to appeal to individuals' insight into the pressing need for change have largely failed (Webb & Sheeran, 2006). One reason for the lack of success may be that the targeted behaviours are largely habitual in nature, occurring outside conscious awareness. A better understanding of the mechanisms underlying habitual responses and individual variations in forming and breaking habits is needed in order to develop more effective strategies to address these global challenges (Marteau, Hollands, & Fletcher, 2012).

Habits constitute response patterns that a person repeatedly exhibits in a specific situation (Lally & Gardner, 2013; Wood & Runger, 2016). These responses are learned and become automatically activated when the individual enters the associated environment. Examples could be making breakfast on coming into the kitchen in the morning, or putting the mobile phone onto charge when coming home from work. Such

automatic responses are generally triggered by environmental cues, allowing us to perform routine actions highly efficiently whilst focussing our attention on other things. Meanwhile, the original motivation for these habitual actions becomes increasingly irrelevant and, once initiated automatically without intention, habits continue without conscious control. As habits are highly stable, they are difficult to change or break altogether. However, within a different environment (e.g. in a friend's kitchen), the same actions involved in making breakfast may suddenly run less smoothly, requiring conscious attention, and we may likewise run the risk of forgetting to charge the phone at the end of a day off work.

Substantial experimental evidence has shown that habits develop through instrumental learning (Thorndike, 1898). The repetition of reinforced actions, if performed within the same environment, results in contextual stimulus-response associations in memory that trigger the behaviour automatically within that environment (Dickinson, 1985). These stimulus-response associations seem to overshadow the purpose that initially motivated the behaviour, rendering the behaviour insensitive to changes in the value or the contingency of the consequences. When habits are formed, control over the behaviour gradually shifts away from being guided by our intentions to being automatically triggered by cues in the environment. Consequently, once formed, habits are no longer motivated by a goal, and are thus difficult to break with goal-oriented intentions or knowledge of the consequences of habitual actions (Wood & Neal, 2007).

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There is significant variation in the degree to which different individuals show a propensity for developing habits. While some people delight in novelty and change in their lives, others go so far as to even describe themselves as ‘creatures of habit’, an expression that reflects their appreciation of routine and regularity in their lives. What underlies these individual differences in habit formation is still largely elusive, but may provide important insight into differences in the strategies needed to change habits in different people. Nevertheless, a number of factors have already been identified that can influence the switch of initially goal-directed actions into habitual responses. These include prolonged practice (Boakes, 1993; Dickinson, Balleine, Watt, Gonzalez, & Boakes, 1995; Neal, Wood, & Quinn, 2006), experiences of acute or chronic stress (Dias-Ferreira et al., 2009; Schwabe & Wolf, 2011), or exposure to stimulant drugs (Nelson & Killcross, 2006; Corbit, Chieng, & Balleine, 2014). By contrast, strong executive functions seem to promote goal-directed behaviours (Otto, Raio, Chiang, Phelps, & Daw, 2013), and possibly facilitate the regain of control over behaviours that have become habitual.

A core question meriting consideration revolves around the extent to which ‘creature of habit’ traits might represent a vulnerability marker for the development of clinical conditions in which habitual behaviours have spiralled out of control, such as drug addiction, gambling, obsessive-compulsive disorder, or eating disorders. Indeed, a number of mental health problems involve rigid and inflexible routines, and actions performed in response to particular triggers regardless of negative consequences (American Psychiatric Association, 2013). Clarification around a role for proneness to habits in these conditions may shed light on more successful treatments than those currently available.

Habitual behaviour can be assessed by experimental paradigms that manipulate the value or contingencies of the outcome to identify behaviour patterns that persist irrespective of such manipulations (Ersche et al., 2016; de Wit, Niry, Wariyar, Aitken, & Dickinson, 2007; Mckim, Bauer, & Boettiger, 2016; Gillan et al., 2013). Evidently, self-report measurements of behaviours that largely occur without awareness is not without criticism (Sniehotta & Presseau, 2012). The self-reported habit index (SRHI) is one of the few questionnaires that evaluate individuals’ perception of a particular behaviour with respect to frequency, automaticity, efficiency, and self-reference using a 12-item rating scale (Verplanken & Orbell, 2003). The focus of the SRHI lies on a specific recurring behaviour that has been identified by the researcher, not by the scale. This presents a major drawback of the SRHI, as it excludes individuals who, due to a different lifestyle, do not engage in the behaviour in question. To the best of our knowledge, there are currently no tools available to assess more generally how individuals differ in their engagement in habits in daily life.

The aim of the present study, therefore, was to develop a scale that reflects variations in individuals’ tendencies towards responding in a habitual manner in everyday life. Variations in proneness to habit may be driven by a need for structure and predictability, which may reassure anxious individuals who worry about uncertainty and the possibility of things going wrong in novel situations (Evans et al., 1997; Connors, Bisogni, Sobal, & Devine, 2001). We therefore hypothesized that increased habitual tendencies are associated with higher levels of anxiety and obsessive-compulsive traits. Conversely, sensation-seeking traits and goal-striving personalities are likely to run counter to regularity and repetition (Dunn, 2000). We therefore predicted that low levels of habitual behaviours in daily life are associated with high levels of sensation-seeking and goal pursuit. An ancillary aim of the study was to examine whether exposure to stress or stimulant drugs, which have been shown to promote habitual responding in experimental settings, also affect participants’ self-reported habitual tendencies.

## 2. Methods

### 2.1. Scale development

For the first step in developing a scale measuring characteristic behaviours and attitudes for ‘creature of habit’ traits, we generated a

pool of 59 items based on a thorough review of the literature, and interviews and discussions with experimental and health psychologists. On compiling the questionnaire, we noticed that half of the generated items related to tendencies describing regular behaviours (e.g. I park my car always in the same place), mental attitudes surrounding the minimisation of effort (e.g. I quite happily work within my comfort zone), or the establishment of safety/predictability (e.g. I rely on what is tried and tested), as well as emotional reactions when faced with irregularity (e.g. I hate it when the grocery store re-arranges the aisles). The other half of the items were behaviours occurring in the context of eating, such as describing behaviour motivated by preferences (e.g. I have a preferred sandwich), automatic responses (e.g. I always follow a certain order when preparing a meal), and behaviours characterised by a lack of planning (e.g. I tend to cook more than I eat). Participants were required to indicate for each statement their level of agreement on a 5-point Likert scale, ranging from strongly disagree (1) to strongly agree (5). We extensively piloted the questionnaire within the local community and conducted face-to-face interviews about the meaning of the items. Items that were consistently misunderstood were either reworded or removed. Further piloting showed that administering the entire 59-item questionnaire presented a challenge to participants, so that we subsequently divided it into two parts. Although the categorisation of general habits and food-related habitual responses was initially unintended, it provided a rationale for splitting the COHS into two parts with similar numbers of items (see Appendix A).

### 2.2. Study sample

We used Amazon’s Mechanical Turk (MTurk), a crowdsourcing internet marketplace, to collect data from 406 individuals in the online community. Forty-four participants (11%) were excluded due to either incompleteness, invalid responses or duplication of data, leaving a total sample of 362 participants (47% male), whose identity remained anonymous to the research team. Participants had to be at least 18 years of age [mean age 39.7 years  $\pm$  11.5 standard deviation (SD)] and based in the United States of America. All participants received \$2.00 for completion of the study, which included the two parts of the COHS with the items in each part being presented in random order, and a selection of validated questionnaires to assess personality traits of anxiety, compulsivity, sensation-seeking, and goal-pursuit. We also collected background information, including ethnicity, native language, education level, and employment status. Moreover, we asked participants to indicate whether they have ever had any experience with stimulant drugs (either for recreational purposes or as medication) and to complete the Childhood Trauma Questionnaire (CTQ, Bernstein et al., 2003). The characteristics of the full study sample and the subgroups are shown in Table 1. As recommended by Meade and Craig (Meade & Craig, 2012), we also included two attention check items to safeguard against careless participants. The study was approved by the Psychology Research Ethics Committee (Pre.2015.124; PI:KDE).

### 2.3. Personality measures

**Anxiety personality traits:** The trait version of the Spielberger State-Trait Anxiety Inventory (STAI, Spielberger, Gorsuch, Lushene, & Jacobs, 1983) assesses variations in trait anxiety of a long-standing nature. It consists of 20 questions surrounding worry, tension, apprehension, and nervousness that are rated on a 4-point scale ranging from almost never (1) to almost always (4). **Obsessive-compulsive Personality Traits:** The Obsessive-Compulsive Inventory–Revised (OCI-R, Foa et al., 2002) is an 18-item questionnaire to assess obsessive-compulsive symptoms in both clinical and non-clinical samples. Participants rate the degree to which they have been bothered or distressed by obsessive-compulsive symptoms in the past month on ranging from not at all (0) to extremely (4). **Sensation-Seeking Personality Traits:** The Sensation-Seeking Scale Form-V (SSS-V, Zuckerman, 1996) is a widely-used

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