Received: 10 May 2021 | Revised: 31 May 2021 | Accepted: 8 June 2021

DOI: 10.1002/pmh.1524

RESEARCH ARTICLE

Personality and Mental Health

The Habitual Tendencies Questionnaire: A tool for psychometric individual differences research

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Funding information
Wellcome Trust, Grant/Award Number: 104631/z/14/z; Gates Cambridge Scholarship

Abstract

Habits are automatic responses to learned stimuli or contextual cues that are insensitive to goals. Although habits may allow for automated behaviours that increase efficiency in our daily lives, an over-reliance on habits has been suggested to contribute to disorders such as obsessive–compulsive disorder (OCD). There are currently few established measures of individual differences in habitual tendencies. To fill this gap, the present study generated and validated a novel 11-item scale, the Habitual Tendencies Questionnaire (HTQ), to measure individual differences in habitual tendencies in the general population. In Study 1, factor analysis revealed three underlying subcomponents of the HTQ: Compulsivity, Preference for Regularity, and Aversion to Novelty, with Compulsivity showing the strongest association with subclinical OCD symptomatology. Study 2 validated the HTQ and replicated the findings of Study 1 in a larger sample, and explored relationships with other personality traits. The results emphasise the importance of measuring individual variation in habitual thinking styles, illustrating that different facets of habitual tendencies may contribute to diverse behavioural and clinical outcomes. The present investigation provides a new, reliable way of measuring habitual tendencies and has important implications for future explorations into the nature of individual differences from a dimensional perspective to psychiatry.

1 | INTRODUCTION

Living creatures are 'bundles of habits' as observed by James (1890, p. 3), and indeed, humans quickly learn to repeat and perpetuate responses when faced with recurring contextual cues. Nonetheless, not all individuals are equally 'habitual', with some individuals exhibiting strong tendencies towards routine and compulsivity in their daily lives, whereas others naturally reject routine and repetition and opt for more varied change instead. Individual differences in habitual tendencies may underpin or reflect a large range of cognitive dispositions and behavioural outcomes, and so developing an effective questionnaire that taps into such individual differences is valuable across the psychological sciences. Scholars have noted the importance of conceptual and methodological assessment tools of habitual behaviour for the progress of habit research and application (De Houwer, 2019; Gardner, 2015; Luigjes et al., 2019; Mazar & Wood, 2018), and so the present investigation seeks to provide a measure of domain-general personality tendencies towards habits that will allow scientists to map out the mind prone to habits.

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Verplanken and Aarts (1999, p. 104) defined habits as 'learned sequences of acts that have become automatic responses to specific cues, and are functional in obtaining certain goals or end-states'. However, this definition does not take into account other aspects of habits, such as compulsive and addictive behaviours, which are not necessarily goal-directed. More recent definitions of habits include 'automatic behavioural responses to environmental cues, thought to develop through repetition of behaviour in consistent contexts' (Lally & Gardner, 2013, p. 137) and 'representations of stimulus–response links that do not refer to goals, and are in a sense directly elicited by the environmental states or stimuli or contexts' (Robbins & Costa, 2017, p. 1201). These suggest that habits are not goal-directed, but instead emphasise their stimulus–response nature. Indeed, it is now widely accepted that habitual behaviours are not mediated by goal pursuit (Wood & Neal, 2007). Although a behaviour may originally have been motivated by goal pursuit, once it has been established as a habit, the goal is no longer needed to motivate the behaviour (Ersche et al., 2017).

Despite a long tradition of theorising about the nature of habit, from James to modern neuroscience, some have suggested that habit is an 'empty construct'. This is because many of these studies used past behavioural frequency as a measure of habit, and statistical relationships between past and future behaviours are ambiguous as they may be influenced by confounding variables that are not measured. However, Verplanken and Aarts (1999, p. 102) argued against the notion of habit as an 'empty construct'. Instead, they suggested that different paradigms are needed in order to understand habits more fully, and that 'habits are not only response programs, but may have far-reaching consequences for our cognitive functioning, for instance the way we perceive situations and process information'. This emphasises the importance of studying habits, not only in themselves but also as indicators of cognitive functions and various personality traits. Habits can be beneficial by improving efficiency in our daily lives and increasing the availability of cortical processing capacity for novel, important situations (Robbins & Costa, 2017). However, excessive reliance on habits can be detrimental to behavioural plasticity and can contribute to the development of disorders of compulsivity (Gillan et al., 2016) such as obsessive–compulsive disorder (OCD; Gillan et al., 2015) and substance dependence (Everitt & Robbins, 2016; Sjoerds et al., 2013).

In order to study habits, we must be able to reliably measure them. Therefore, the current investigation aimed to develop a validated, representative scale to measure individual variation in dependence on habits: the Habitual Tendencies Questionnaire (HTQ). In order to create the HTQ, we first conducted a thorough literature review of existing measures of habits and sought to evaluate their strengths and weaknesses. Two established scales measuring habits that reflect two schools of thought on habits are the Self-Report Habit Index (SRHI) (Verplanken & Orbell, 2003) and the Creature of Habit Scale (COHS) (Ersche et al., 2017, 2019). Verplanken and Orbell (2003, p. 1314) developed the SRHI, a 12-item self-report index of habit strength, to reflect their argument that "habit is a psychological construct, rather than simply past behavioral frequency". Consequently, the SRHI aims to focus on features of habit such as a history of repetition, automaticity and expressing one's identity, rather than on past behavioural frequency. In this scale, a particular behaviour, X, is followed by 12 different options from which the participant must choose, such as '...I do frequently' or '...I do without thinking'. Nonetheless, the behaviours used for X in two out of four experiments in this study related to modes of transport, which may not be representative of an individual's dependence on habits in general. In another experiment, participants were asked to list some of their own habits, which they performed either daily or weekly. Although using habits unique to each participant ensured that the behaviours were relatable, this is a very time-consuming method and thus would not be feasible to use in many research designs. Furthermore, these behaviours were assumed to be habitual based on their frequency and regularity, which seems to contradict the authors' argument that habit is not exclusively past behavioural frequency.

Additional self-report scales that build on the SRHI from the clinical literature assess domain-specific habits, such as habits with regards to alcohol use (Grodin et al., 2019; Piquet-Pessôa et al., 2019), smoking habits (Ray et al., 2020), hoarding (Maier, 2004) and physical activity habits (Hagger, 2019). Nevertheless, an overemphasis on the domain-specificity of habits, and measuring them exclusively in domains deemed clinically aberrant can lead to a neglect of the mapping of *what makes a mind prone to habits*, regardless of the domain in which these habits operate (alcohol, hoarding, smoking, etc.). This opens up key empirical and theoretical questions about the nature of habitual thinking and how these are instantiated neurally. Consequently, in the present study, we concurred with Verplanken and Orbell's view that habit is a psychological construct that includes behaviours with a history of repetition, automaticity and expressing one's identity. Here, we take this one step further and consider habits as also encompassing attitudes, beliefs and thinking styles. Therefore, we set out to develop an easy-to-administer tool to measure all of these aspects of habits, with items that are representative of habits in general, and as universally relatable as possible.

Another recent scale developed to measure habits is the COHS (Ersche et al., 2017). Two main subscales were identified by the authors: routine and automaticity, reflecting two different features of habits. A potential limitation of the COHS is that more than half of the items are food-related, and these items make up the majority of the automaticity subscale. It is possible that an individual's food-related habits are not representative of their habitual tendencies in general, as many people are habitual in their eating behaviours (van't Riet et al., 2011), but not necessarily in other aspects of their daily lives. Therefore, we avoided including food-related or domain-specific habit items in the HTQ.

To the best of our knowledge, no scale exists that measures behaviours, attitudes, beliefs and thinking styles relating to habits. Incorporating these dimensions was important in order to reflect the psychological literature indicating phenomenological and conceptual distinctions among attitudes, behaviours, beliefs and cognitive styles (Ajzen, 1989; Armitage & Christian, 2003). Here, in the context of tapping into habitual tendencies, we considered these four dimensions as follows: *behaviour* as reflecting individual differences in dependence on routines or habits in daily life, *attitude* as the desire for structure or order in life (which might make individuals routine-prone), *belief* as beliefs about the value of having routines or habits (not about the personal self but in general) and *thinking style* in terms of a compulsive thinking style that is susceptible to habitual or non-goal-directed behaviour. All these dimensions may play major roles in the development and maintenance of habits, as well as potentially contributing to associations between habits and other aspects of cognition such as personality traits, psychopathology and cognitive functions. Therefore, the HTQ aims to encompass all of these aspects of habits.

Our criteria for the HTQ were such that it should consist of items that are conceptually representative of the habitual tendencies construct in general, as per our definitions and descriptions; be relatable to everyday life for individuals across the general population; and be quick and easy to administer. Study 1 sought to create a new scale to measure individual differences in habitual tendencies, the HTQ, and Study 2 aimed to validate and replicate the HTQ in a larger sample, and to explore the relationships between the HTQ and the COHS (Ersche et al., 2017).

2 | STUDY 1

In order to construct the HTQ, we conducted an extensive literature review of existing measures in order to identify potential items that could be used and adapted to create a multidimensional self-report scale of habitual tendencies in healthy individuals. We consulted the following theoretically-adjacent constructs:

- *Intolerance of uncertainty or ambiguity*, defined as 'the tendency to perceive (i.e. interpret) ambiguous situations as sources of threat' (Stanley Budner, 1962, pp. 29–30), with ambiguous situations being described as those 'which cannot be adequately structured or categorised by the individual because of the lack of sufficient cues'. Frenkel-Brunswik, cited in Bar-Tal (1994), suggested that intolerance of ambiguity is a preference for familiarity, symmetry, definiteness and regularity, all of which seem to reflect qualities of habits.
- *Need for cognitive closure*, defined as 'an answer on a given topic, any answer ... compared to confusion and ambiguity' (Kruglanski, 1990, p. 337).
- *Need for cognitive structure*, defined as 'the desire for clear and firm knowledge concerning a given topic, as opposed to ambiguity, doubt, or confusion' (Bar-Tal, 1994, p. 46).
- *Routines*, defined as 'familiar action patterns that involve regularity, which are likely to be performed on a daily basis' (Ersche et al., 2017, p. 77)
- *Automaticity*, with automatic actions being defined as those that are 'initiated by environmental cues without a deliberate intention, and they may even continue without the involvement of conscious control' (Ersche et al., 2017, p. 78)
- *Compulsivity*, defined as 'the tendency to repeat over and over a certain kind of behavior despite its inappropriateness, and to be unable to inhibit the behavior' (Bari & Robbins, 2013, p. 52). Compulsivity has further been described as the 'manifestation of an imbalance between the brain's goal-directed and habit-learning systems' (Gillan et al., 2016, p. 828), and as 'a maladaptive perseveration of behaviour' (Robbins et al., 2012, p. 83), contributing to the use of habit as a model of compulsivity.

All of the above constructs reflect different characteristics of habitual tendencies and thus were included as keywords in our literature search.

3 | METHODS

3.1 | Participants

For Study 1, we recruited 165 participants, each of whom were paid $4.50 for their participation in the study, through Amazon Mechanical Turk (MTurk) online platform, which is well established for obtaining general

population samples (Cheung et al., 2017). Of these, 35 (21.2%) were removed prior to data analysis due to failure of attention checks and repeat participation in the study identified via duplicated IP addresses. The 130 remaining participants consisted of 49% males, 50% females and 1% other, between the ages of 22 and 73 ($M = 39.527$, $SD = 12.120$). All participants were based in the United States. The sample identified as 72% White, 11% Mixed ethnicity, 8% Black or African American, 6% Asian, 2% American Indian or Alaska Native, and 1% Hispanic/Latino. The highest levels of educational attainment of the sample population were as follows: 1% had achieved less than a high school degree, 13% had graduated high school, 19% had completed some school but did not have a degree, 15% had completed a 2-year Associate degree in college, 38% had completed a 4-year Bachelor's degree in college, 12% had a Master's degree, and 2% had a Doctoral or Professional degree. Ethical approval for the study was obtained from the Department of Psychology Ethics Committee of the University of Cambridge. Electronic informed consent was obtained from all participants before beginning the survey, in line with the Declaration of Helsinki (1964), and participants were informed that they may terminate their participation in the study at any point.

3.2 | Scale development

The development of the HTQ followed a rigorous process of item selection (see Figure 1 for flowchart of scale development). Following a thorough literature review, we selected a series of keywords relating to habits and used these to search for relevant existing scales in Google Scholar. These keywords were as follows: 'cognitive closure', 'cognition', 'uncertainty', 'ambiguity', 'cognitive structure', 'habit*', 'routine*', 'automatic*', 'goal-directed', and 'compulsiv*'. We also used a citation search, in order to maximise the number of scales identified. We then pooled all the items from each of the scales found. Twenty-seven scales were identified, resulting in a total of 618 items. We used a process of elimination to narrow down the number of potential items for the HTQ. Firstly, the full versions of scales were removed, where validated shortened or revised versions existed, as were scales consisting entirely of items irrelevant to the HTQ. Nineteen scales then remained. Next, where factor loadings were available, items with factor loadings below 0.4 were removed, to ensure that the remaining items were representative, and following this, any duplicate items were removed in order to achieve nonredundancy. This resulted in a pool of 401 items. Finally, we selected 37 of these items for our scale. For each item, we considered its

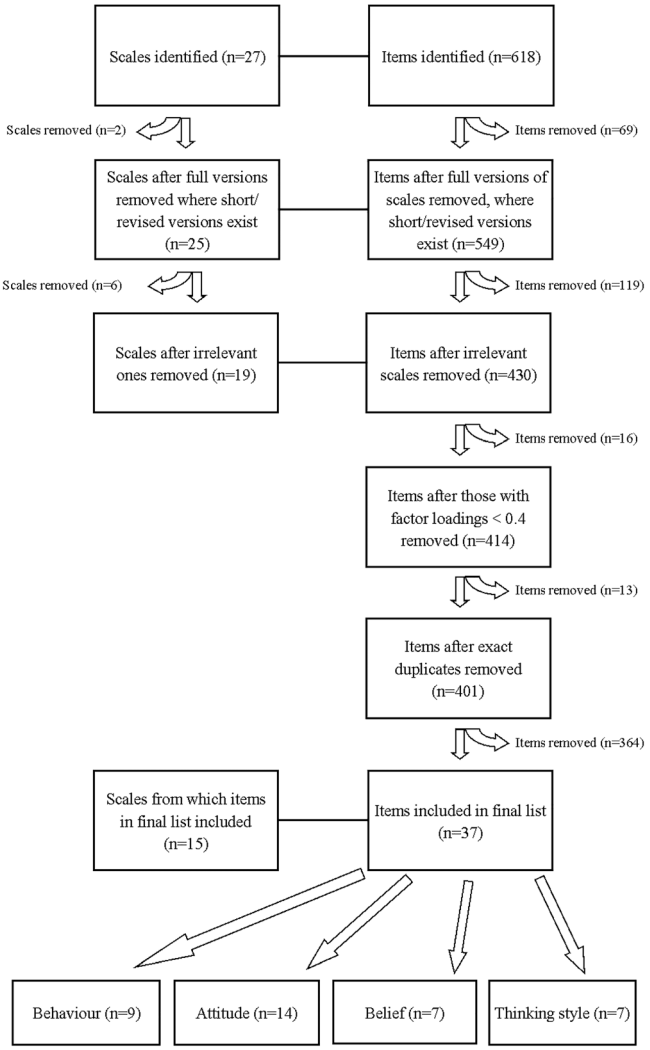

FIGURE 1 Flowchart of scale development

uniqueness; relevance to our four proposed aspects of the habitual tendencies construct; conceptual clarity; and applicability to current, everyday life. The HTQ aims to capture four distinct aspects of habits: behaviour, attitude, belief and thinking style. Therefore, as we selected items for our scale, we categorised each item into one of these four subscales, ensuring a minimum of seven items per subscale (see supporting information).

3.3 | Measures

We administered the 37-item HTQ scale, along with the additional measures and cognitive tasks, in the form of an electronic survey. Items from the HTQ were rated on 7-point Likert scales ranging from 'Strongly disagree' to 'Strongly agree' and were randomised across factor categories. In order to measure subclinical OCD symptomatology, we used the 18-item revised version of the

Obsessive–Compulsive Inventory (OCI) (Foa et al., 2002), which was rated on 5-point Likert scales ranging from 'Not at all' to 'Extremely', and had a high Cronbach's α value of 0.954. Example items included: 'I repeatedly check doors, windows, drawers, etc.' and 'I frequently get nasty thoughts and have difficulty in getting rid of them'. In order to measure intolerance of uncertainty, we used the 12-item short version of the Intolerance of Uncertainty Scale (IUS) (Carleton et al., 2007), which was rated on 5-point Likert scales ranging from 'Not at all characteristic of me' to 'Entirely characteristic of me', and had a high Cronbach's α value of 0.912. Example items included 'Unforeseen events upset me greatly' and 'The smallest doubt can stop me from acting'. In order to measure autism-spectrum traits, we used the 10-item short version of the Autism Quotient, AQ-10 (Allison et al., 2012), which was rated on 4-point Likert scales ranging from 'Definitely disagree' to 'Definitely agree', and had an adequate Cronbach's α value of 0.684. Example items included 'I often notice small sounds when others do not' and 'I find it easy to work out what someone is thinking or feeling just by looking at their face'. The survey also included two interspersed measures of attention to ensure that participants were concentrating on their responses to the questions ('I am paying attention to this survey. I strongly agree').

4 | RESULTS

All statistical analyses were conducted using JASP (Version 0.12.2; JASP Team, 2020), SPSS (Version 27.0; IBM Corp, 2020) and R Studio (RStudio Team, 2020).

The HTQ scores based on the 37-item version followed an approximately normal distribution according to the Shapiro–Wilk test ($p = 0.955$), with minimal skewness (−0.090) and kurtosis (0.136), and Cronbach's α was calculated to be 0.903, with a 95% confidence interval (CI) [0.878, 0.926].

4.1 | Factor analysis

Factor analysis is a statistical dimensionality reduction method for empirically identifying the structure underlying a variety of measurements (Thompson, 2007). Thompson further states that factor analysis is used for three main purposes: (1) 'empirically creating a theory of structure', (2) 'evaluating whether factored entities cluster in a theoretically expected way' and (3) 'estimating latent variables scores (i.e., factor scores) that are then used in subsequent statistical analyses ... in place of the measured factored entities'. We used factor analysis for the second of these purposes, in order to validate the HTQ, and to create a shorter, revised version of the HTQ, consisting of the items most representative of the habitual tendencies construct.

Exploratory factor analysis (EFA) was carried out using maximum likelihood as the factor extraction method, as recommended by Costello and Osborne (2005) (see Table S1 for factor loadings). We expected the different aspects of habits to be intercorrelated and thus used oblique oblimin rotation with parallel analysis. Four factors were obtained, supported by the scree plot and path diagram. We then applied some a priori decision criteria (in line with past research, e.g., Krumrei-Mancuso & Rouse, 2016), in order to select which items would be included in further analyses. These were as follows: items must have a minimum factor loading of 0.4, which resulted in the removal of nine items (HTQ11, HTQ12, HTQ13, HTQ17, HTQ 20, HTQ21, HTQ25, HTQ32 and HTQ34); items must not cross-load onto their alternative factors above 0.3, which resulted in the removal of a further eight items (HTQ 3, HTQ5, HTQ14, HTQ15, HTQ22, HTQ23, HTQ29 and HTQ31). EFA was then run again in order to avoid skew due to the removed items, and three factors were obtained (see Table S2). One further item (HTQ2) was subsequently removed as its factor loading was below 0.4, and thus, it did not fulfil our inclusion criteria. A third EFA was then carried out, and the three-factor structure was maintained with 19 items.

Examination of the items in each of the three factors revealed that each factor reflected a distinct aspect of habitual tendencies. Factor 1 encompassed items related to compulsivity and very clearly reflected the *thinking style* dimension of habitual tendencies. Factor 2 encompassed items related to a preference for regularity and routines, mirroring the *attitude* dimension of habitual tendencies: desire for structure or order in life. Factor 3 encompassed items related to an aversion to new experiences or change, reflecting habitual *behaviours*.

4.2 | Item selection for a shortened scale

In order to create an easy-to-administer scale, we sought to shorten it. As manifest in Figure 2, we decided to select up to four items per factor, choosing the items that loaded most strongly on those factors in the EFA. This resulted in the selection of 11 items, which were subjected to another EFA (see Table 1 and Figure S1). As expected, three factors emerged, supported by the scree plot and path diagram (see Figure S1), and all items continued to load onto the same factors as they had previously done.

Descriptive statistics and reliability analysis were then carried out on the final HTQ scale (all subsequent mentions of the HTQ refer to this final, 11-item scale—see Appendix A), as well as for each factor individually. The HTQ scores continued to follow a normal distribution according to the Shapiro–Wilk test ($p = 0.369$), with minimal skewness (−0.019) and kurtosis (−0.080), and the mean total score was 34.546 (maximum possible score = 66, range = 9–55), with standard deviation 9.042 (see Figure 3). For the 11-item scale, Cronbach's α was 0.764, with 95% CI [0.699, 0.820]. Cronbach's α values showed good reliability for each factor, or subscale. These were 0.878 for Compulsivity; 0.770 for Preference for Regularity; and 0.733 for Aversion to Novelty.

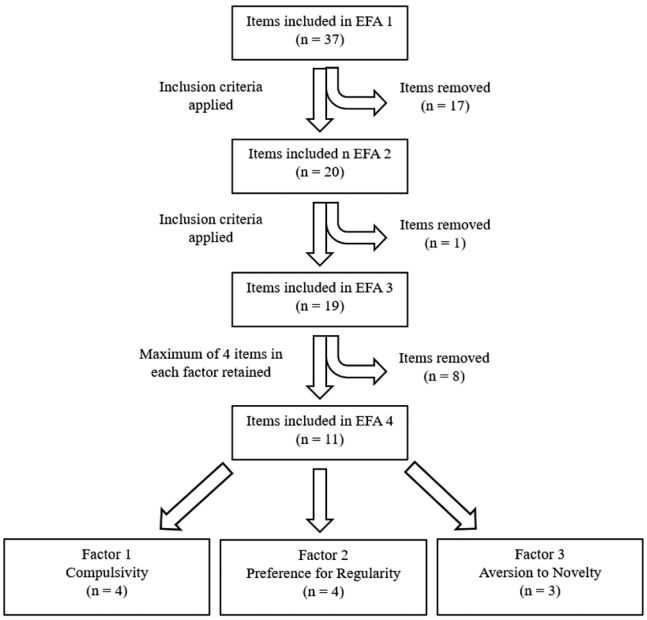

FIGURE 2 Flowchart of item selection for final 11-item Habitual Tendencies Questionnaire (HTQ)

4.3 | Construct validity

As evident in Table 2, all three HTQ subscales showed significant and strong positive correlations with the 11-item HTQ (with r values above 0.5), but only weak, mostly non-significant correlations with each other (with r values less than 0.5). This corroborates the factor analysis in suggesting that each subscale is representative of a distinct aspect of the habitual tendencies construct.

In order to evaluate the relationships between the HTQ and relevant behavioural outcomes, we assessed the correlations between the HTQ and subclinical OCD

TABLE 1 Exploratory factor analysis of final 11-item Habitual Tendencies Questionnaire

	Component loadings			
Items	**Factor 1**	**Factor 2**	**Factor 3**	**Uniqueness**
HTQ 37: I tend to dwell on the same issues	**0.91**	−0.05	0.02	0.18
HTQ 36: I mentally fixate on certain issues and cannot move on	**0.88**	0.02	−0.03	0.22
HTQ 35: The same thoughts often keep going through my mind over and over again	**0.84**	0.00	0.06	0.27
HTQ 33: I tend to repeat actions because I keep doubting that I have done them properly	**0.59**	0.10	−0.17	0.63
HTQ 10: I like to have a regular, unchanging schedule	−0.02	**0.70**	0.10	0.46
HTQ 9: There is comfort in regularity	−0.10	**0.67**	−0.06	0.58
HTQ 27: A good job has clear guidelines on what to do and how to do it	−0.01	**0.67**	−0.09	0.59
HTQ 1: I hate it when my routines are disrupted	0.14	**0.68**	0.10	0.43
HTQ 30: I look forward to new experiences R	0.03	0.02	**0.92**	0.14
HTQ 26: Life is boring if you never take risks and always play it safe R	−0.06	0.00	**0.67**	0.56
HTQ 7: When eating at restaurants, I like to try new dishes rather than ones I have tried before R	−0.04	0.02	**0.54**	0.71
Correlation with factor 1	1.00			
Correlation with factor 2	0.17	1.00		
Correlation with factor 3	0.13	0.33	1.00	

Note: R = reversed item.

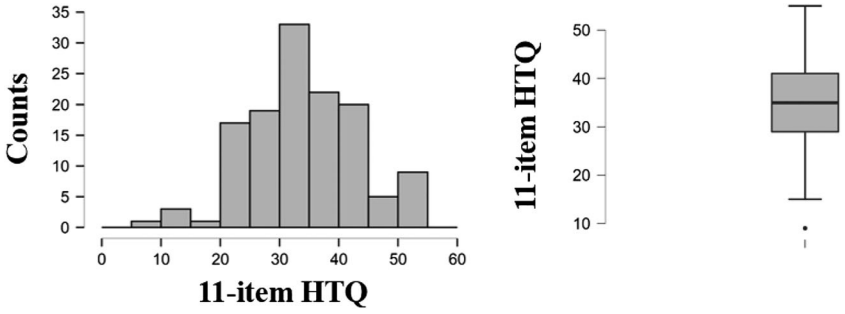

FIGURE 3 Descriptive statistics for final, 11-item Habitual Tendencies Questionnaire (HTQ): distribution plot and boxplot

TABLE 2 Correlation matrix of the Habitual Tendencies Questionnaire and OCD traits, including Pearson's correlations and Bayes factors

		HTQ	HTQ compulsivity	HTQ regularity	HTQ aversion to novelty
HTQ	Pearson's *r*	—			
	BF_{10}	—			
HTQ compulsivity	Pearson's *r*	**0.728*** **	—		
	BF_{10}	4.897×10^{19}	—		
HTQ regularity	Pearson's *r*	**0.672*** **	0.161	—	
	BF_{10}	2.863×10^{15}	0.573	—	
HTQ aversion to novelty	Pearson's *r*	**0.577*** **	0.065	**0.278** **	—
	BF_{10}	1.335×10^{10}	0.143	17.309	—
OCI	Pearson's *r*	**0.484*** **	**0.598*** **	0.146	0.103
	BF_{10}	2.293×10^{6}	1.474×10^{11}	0.425	0.215

Note: BF < 3 = Anecdotal evidence; BF < 10 = Moderate evidence; BF < 30 = Strong evidence; BF < 100 = Very strong evidence; BF > 100 = Extremely strong evidence.
Abbreviations: HTQ, Habitual Tendencies Questionnaire; OCI, Obsessive–Compulsive Inventory.
$^{*}p < 0.05$. $^{**}p < 0.01$. $^{***}p < 0.001$.

symptomatology. The Pearson's correlations for these variables were computed (see Table 2). As evident in Table 2, there was a significant positive correlation between the HTQ and OCI scales ($r = 0.484$, $p < 0.001$). Within the three subscales of the HTQ, the Compulsivity subscale contributed the most to this association (see Table 2 and Figure 4), as it showed the strongest correlation with the OCI ($r = 0.598$, $p < 0.001$), whereas the Preference for Regularity and Aversion to Novelty subscales were not significantly correlated with the OCI. The Pearson's *r* effect sizes of 0.484 and 0.598 are relatively large, as per the individual differences research guidelines set out by Gignac and Szodorai (2016).

To complement the Pearson's correlations, we also examined the Bayes Factors (see Table 2), which quantify the evidential strength in favour of a significant correlation given the present data (H_1, the alternative hypothesis), or in favour of no significant correlation given the present data (H_0, the null hypothesis). In line with the guidelines by Wagenmakers et al. (2018), a Bayes Factor (BF_{10}) above 100 indicates 'extreme evidence' for H_1 (significant correlation). Here, we found that the relationship between HTQ Compulsivity and the OCI possesses an extremely large Bayes Factor of 1.474×10^{11} (see Table 2), indicating that the observed data iare 1.474×10^{11} times more likely under H_1 than H_0. See supporting information for analysis of the associations of the HTQ with intolerance of uncertainty and autism spectrum traits.

We then conducted a two-step hierarchical linear regression with the three subscales of the HTQ as predictors of subclinical OCD symptomatology, and age, gender and educational attainment as covariates. Of the demographic variables, only age was a significant predictor of subclinical OCD symptomatology ($\beta = -0.233$, $t(127) = -2.616$, $p = 0.010$), and of the three HTQ subscales, only HTQ Compulsivity emerged as a significant predictor of subclinical OCD symptomatology ($\beta = 0.546$, $t(127) = 7.385$, $p < 0.001$). The demographic variables explained 6.5% of the variance in subclinical OCD symptomatology ($R^2 = 0.065$, $F(3, 124) = 2.853$, $p = 0.040$), but addition of the three subscales of the HTQ in step 2 increased the R^2 term to 0.386, accounting for a further

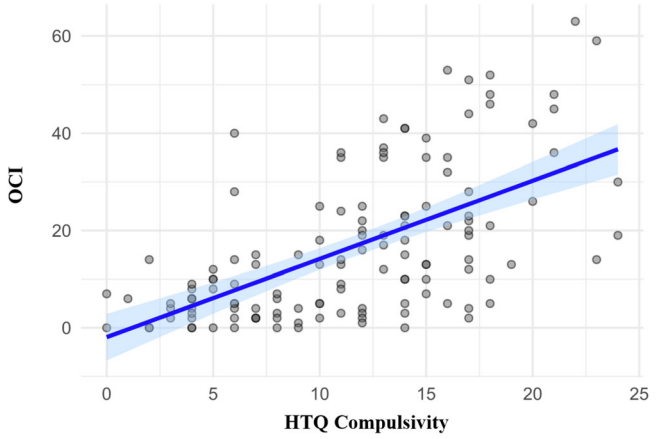

FIGURE 4 Scatter plot showing correlations between the Obsessive–Compulsive Inventory (OCI) and the compulsivity subscale of the Habitual Tendencies Questionnaire (HTQ)

32.1% of the variance in subclinical OCD symptomatology ($R^2 = 0.386$, $F(3, 121) = 12.704$, $p < 0.001$).

4.4 | Interim discussion

Study 1 has developed and validated a reliable, representative 11-item scale to measure individual differences in habitual tendencies in the general population, the HTQ. A total of 618 items from 27 existing scales were pooled through keyword and citation searches. Item selection took place through a process of elimination using a priori decision criteria, by considering factor loadings, non-redundancy, relevance to our four proposed aspects of the habitual tendencies construct, conceptual clarity and applicability to current everyday life (see Figure 1). EFA resulted in the subdivision of the HTQ into 3 subscales, namely, Compulsivity, Preference for Regularity and Aversion to Novelty (see Tables 1,S1 and S2). The HTQ as a whole encompassed the four aspects of habits we originally proposed: behaviour, attitude, belief and thinking style, highlighting that habits are more than merely past behavioural frequency (Verplanken & Orbell, 2003). However, although the three subscales obtained after factor analysis represented three distinct aspects of the habitual tendencies construct, these subscales differed somewhat from our four originally-proposed theoretical aspects (see supporting information, Extended 37-Item Habitual Tendencies Questionnaire). The clustering of items into the three distinct HTQ subscales provides a new way of dividing the habitual tendencies construct into its component parts and allows the different aspects of habits to be studied separately. The construct validity of the HTQ was then demonstrated by exploring the Pearson's correlations and Bayes factors of the relationships between the HTQ, its three subscales, and existing measures of subclinical traits of clinical disorders related to maladaptive habits. Most notably, significant, strong positive correlations were found between HTQ Compulsivity and subclinical OCD symptomatology (as measured by the OCI). These findings suggest that the HTQ as a whole is representative of a range of different habitual tendencies, and its individual subscales may be used to explore the variable ways in which habits are distributed across different subclinical traits of clinical disorders. For example, the relationship between HTQ Compulsivity and the OCI implies that thinking style, rather than other features such as behaviour or attitudes towards the value of habits, is specifically related to subclinical OCD symptomatology. Hierarchical regression demonstrated that the three subscales of the HTQ explain a significant proportion of the variance in subclinical OCD symptomatology, and furthermore, revealed HTQ Compulsivity to be a significant predictor of subclinical OCD symptomatology. As such, the HTQ may be used as a validated measure of individual differences in habitual tendencies, and its subscales may have an important role in predicting subclinical traits in the general population.

5 | STUDY 2

Study 1 developed the HTQ and examined its relationships with subclinical OCD symptomatology in an exploratory way, demonstrating that its Compulsivity subscale acts as a predictor of OCD traits in a sample of the general population. In order to replicate and extend the findings of Study 1, we conducted a second study. Study 2 aimed to reproduce the positive association between HTQ Compulsivity and OCD traits found in Study 1, and furthermore, to examine how the HTQ relates to a recent measure of habitual tendencies, the COHS (Ersche et al., 2017), in order to determine whether the HTQ is representative of the habitual tendencies construct. The aims of Study 2 were as follows: (1) to replicate the three-factor structure of the HTQ obtained in study 1 in a larger, independent sample; (2) to replicate the relationship between the HTQ and subclinical OCD symptomatology (as measured by the OCI); and (3) to explore associations between the HTQ and a recent measure of habitual tendencies, the COHS (Ersche et al., 2017).

Furthermore, Study 2 was preregistered on the Open Science Framework at the following link: https://osf.io/3ag79/?view_only=0e0478eb848b477180d25e8b175edad9. Some changes were made to Study 1 after the preregistration, namely, that the number of items in the HTQ was reduced from 20 to 11, in order to create an even shorter

scale, resulting in a three-factor structure rather than a four-factor structure. In Study 2, we did not analyse the data for cognitive flexibility, binge eating, alcohol addiction, smoking habits or apathy in relation to the HTQ, as it was beyond the scope of the present paper.

6 | METHODS

6.1 | Participants

In order to collect a well-powered participant pool, we preregistered a power analysis that would allow us to evaluate the relationship between habitual tendencies and relevant behavioural outcomes. In order to estimate the expected effect sizes, we relied on previous work conducted by Ersche et al. (2017) on associations between habitual tendencies and OCD symptomatology. Specifically, Ersche et al. (2017) found a correlation of $r = 0.265$ between the Routine subscale of the COHS and scores on the OCI. The power analysis indicated that a sample of 287 would be needed to detect an equivalent effect size ($\alpha = 0.05$, power $= 0.90$, $r = 0.265$). We oversampled by 34.8% (98 participants) to have a total sample size of 385 due to the high prevalence of repeated IP addresses and bot responses in our sample. Each participant was paid $4.50 for their participation in the study, through MTurk online platform. Of these, 126 (32.7%) were removed prior to data analysis in line with guidance from Meade and Craig (2012) due to: failure of one or both attention checks ($n = 28$), being identified as a bot via repeated answers in an open-answer feature of the survey ($n = 62$), poor English proficiency identified by lack of understanding through irrelevant or incoherent answers to other features of the survey ($n = 25$), repeat participation in the study identified via duplicated IP addresses ($n = 8$), and finally one or more missing answers on the HTQ ($n = 3$). The 259 remaining participants consisted of 56% males, 43% females and 1% other/unspecified, between the ages of 19 and 73 ($M = 37.372$, SD $= 11.280$). All participants were based in the United States. The sample identified as 68.3% White, 13.5% Black or African American, 5.8% Mixed ethnicity, 4.6% Asian, 4.6% Hispanic/Latino, 1.2% American Indian or Alaska Native, 0.4% Native American/Pacific Islander, 1.2% other, 0.4% unspecified. The highest levels of educational attainment of the sample population were as follows: 0.4% had achieved less than a high school degree, 13.1% had graduated high school, 22.0% had completed some school but did not have a degree, 13.9% had completed a 2-year Associate degree in college, 43.2% had completed a 4-year Bachelor's degree in college, 6.6% had a Master's degree, and 0.8% had a Doctoral or Professional degree. Ethical approval for the study was obtained from the Department of Psychology Ethics Committee of the University of Cambridge. Electronic informed consent was obtained from all participants before beginning the survey, in line with the Declaration of Helsinki (1964), and participants were informed that they may terminate their participation in the study at any point.

6.2 | Measures

We administered the 11-item HTQ rated on 7-point Likert scales ranging from 'Strongly disagree' to 'Strongly agree', along with the additional measures and cognitive tasks, in the form of an electronic survey hosted by Qualtrics Survey Software. As in Study 1, these consisted of the revised OCI (Foa et al., 2002), which had a high Cronbach's α value of 0.944 as well as the COHS (Ersche et al., 2017), which had a high Cronbach's α value of 0.902. The survey also included two interspersed attention checks, as in Study 1.

7 | RESULTS

7.1 | Replicating the scale structure

As shown in Figure 5, the HTQ scores followed an approximately normal distribution according to the Shapiro–Wilk test ($p = 0.323$), with minimal skewness (-0.124) and kurtosis (0.015). The mean total score on the HTQ was found to be 35.927 (maximum possible score $= 66$, range $= 6$–63), with standard deviation 10.082, and a good Cronbach's α of 0.810, with 95% CI [0.774, 0.843]. Cronbach's α values for each of the subscales were 0.822 for Compulsivity, 0.777 for Preference for Regularity, and 0.694 for Aversion to Novelty. Next, we conducted a Confirmatory Factor Analysis (CFA), which provides indicators of model fit to help researchers decide whether a model should be rejected or revised in light of new data (Brown, 2015). The CFA was then carried out on the 11-item HTQ (see Figure S2 and Table S3), which indicated that the three-factor structure was adequate [$\chi^2(41, 259) = 104.901$, $p < 0.001$, root mean square error of approximation (RMSEA) $= 0.078$ [0.059, 0.096], standardized root mean square residual (SRMR) $= 0.055$, comparative fit index (CFI) $= 0.934$; Tucker–Lewis Index (TLI) $= 0.912$].

7.2 | Construct validity

As evident in Table 3, all three HTQ subscales showed significant and strong positive correlations with the

11-item HTQ (with r values above 0.5), but only moderate correlations with each other (with *r* values less than 0.5). This corroborates the factor analysis in suggesting that each subscale is representative of a distinct aspect of the habitual tendencies construct.

In order to evaluate the relationships between the HTQ and subclinical OCD symptomatology, we computed the Pearson's correlations for these variables (see Table 3). As evident in Table 3, there was a significant positive correlation between the HTQ and OCI scales ($r = 0.258$, $p < 0.001$). Within the three subscales of the HTQ, the Compulsivity subscale contributed the most to this association (see Table 3 and Figure 6), as it showed the strongest correlation with the OCI ($r = 0.461$, $p < 0.001$), whereas the Preference for Regularity and Aversion to Novelty subscales were not significantly correlated with the OCI. The Pearson's *r* effect sizes of 0.258 and 0.461 are typical and relatively large, respectively, as per the individual differences research guidelines set out by Gignac and Szodorai (2016).

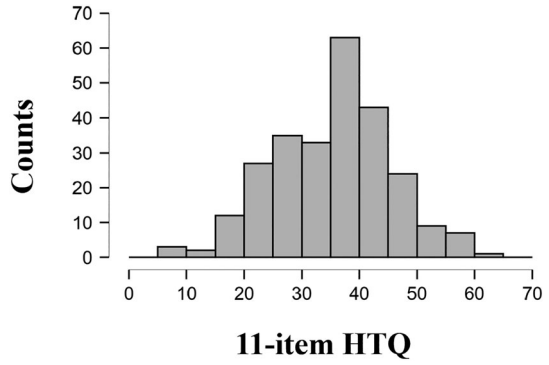

FIGURE 5 Distribution plot for 11-item Habitual Tendencies Questionnaire (HTQ)

To complement the Pearson's correlations, we also examined the Bayes Factors (see Table 3), which demonstrated that that the relationship between HTQ Compulsivity and the OCI possesses an extremely large Bayes Factor of 5.094×10^{11} (see Table 3), indicating that the observed data is 5.094×10^{11} times more likely under H_1 (significant correlation) than H_0 (no correlation). As this Bayes Factor value is above 100, it indicates 'extreme evidence' for H_1, in line with the guidelines from Wagenmakers et al. (2018).

We then explored the relationships between the HTQ and the COHS, a recently-developed self-report measure of habits. Descriptive statistics revealed that the

TABLE 3 Correlation matrix of the Habitual Tendencies Questionnaire, Creature of Habit Scale and OCD traits, including Pearson's correlations and Bayes factors

		HTQ	HTQ compulsivity	HTQ regularity	HTQ aversion to novelty	OCI	COHS total	COHS routine
HTQ	*r*	—						
	BF_{10}	—						
HTQ compulsivity	*r*	**0.747*** **	—					
	BF_{10}	1.188×10^{44}	—					
HTQ regularity	*r*	**0.782*** **	**0.314*** **	—				
	BF_{10}	2.284×10^{51}	44,224.531	—				
HTQ aversion to novelty	*r*	**0.685*** **	**0.198** **	**0.465*** **	—			
	BF_{10}	8.676×10^{33}	12.917	2.355×10^{12}	—			
OCI	*r*	**0.258*** **	**0.461*** **	0.095	−0.080	—		
	BF_{10}	404.171	5.094×10^{11}	0.240	0.173	—		
COHS total	*r*	**0.347*** **	**0.276*** **	**0.302*** **	**0.175** *	**0.220*** **	—	
	BF_{10}	348,786.925	987.477	7300.442	3.245	24.957	—	
COHS routine	*r*	**0.312*** **	**0.218*** **	**0.309*** **	**0.154** *	**0.190** **	**0.881*** **	—
	BF_{10}	15,295.251	27.060	12,651.433	1.391	5.728	1.882×10^{76}	—
COHS automaticity	*r*	**0.273*** **	**0.253*** **	**0.190** **	**0.141** *	**0.181** **	**0.806*** **	**0.430*** **
	BF_{10}	788.434	211.415	6.454	0.887	3.746	1.326×10^{53}	3.020×10^{9}

Note: BF < 3 = Anecdotal evidence; BF < 10 = Moderate evidence; BF < 30 = Strong evidence; BF < 100 = Very strong evidence; BF > 100 = Extremely strong evidence.

Abbreviations: COHS, Creature of Habit Scale; HTQ, Habitual Tendencies Questionnaire; OCI, Obsessive–Compulsive Inventory.

*$p < 0.05$. **$p < 0.01$. ***$p < 0.001$.

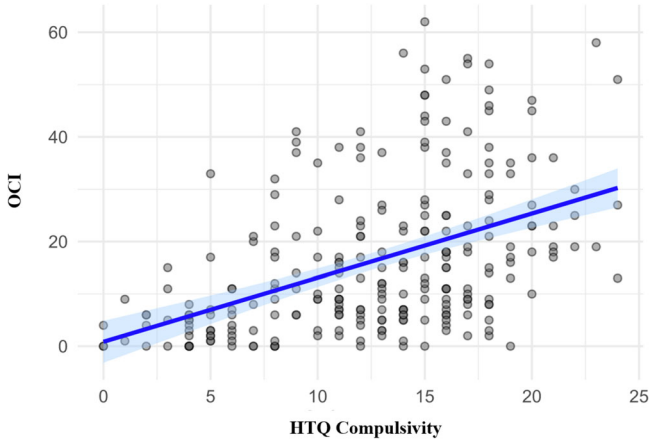

FIGURE 6 Scatter plot showing correlations between the Obsessive–Compulsive Inventory (OCI) and the Compulsivity subscale of the Habitual Tendencies Questionnaire (HTQ)

COHS followed an approximately normal distribution, according to the Shapiro–Wilk test ($p = 0.146$), with minimal skewness (−0.266) and kurtosis (−0.243). The mean total score on the COHS was 87.599 (SD = 18.049), and it had a good Cronbach's α of 0.902, 95% CI = [0.884, 0.918]. Cronbach's α values for each of the subscales were 0.887 for Routine, and 0.863 for Automaticity. CFA was carried out on the COHS, which indicated that the two-factor structure was borderline acceptable ($\chi^2(323) = 743.635$, $p < 0.001$, RMSEA = 0.073 [0.066, 0.080], SRMR = 0.069, CFI = 0.824; TLI = 0.809). As evident in Table 3, there were significant positive correlations between the HTQ and the COHS ($r = 0.347$, $p < 0.001$), as well as their individual subscales. The largest of these correlations was between HTQ Regularity and COHS Routine ($r = 0.309$, $p < 0.001$), suggesting that they may represent similar constructs.

We then conducted a two-step hierarchical linear regression with the three subscales of the HTQ as predictors of subclinical OCD symptomatology, and age and gender as covariates. Of the demographic variables, only age was a significant predictor of subclinical OCD symptomatology ($\beta = -0.283$, $t(249) = -4.602$, $p < 0.001$), and of the three HTQ subscales, HTQ Compulsivity emerged as the most significant predictor of subclinical OCD symptomatology ($\beta = 0.443$, $t(249) = 7.262$, $p < 0.001$). The demographic variables alone explained 7.9% of the variance in subclinical OCD symptomatology ($R^2 = 0.079$, $F(2, 247) = 10.601$, $p < 0.001$), but addition of the three subscales of the HTQ in Step 2 increased the R^2 term to 0.259, accounting for a further 18% of the variance in subclinical OCD symptomatology ($R^2 = 0.259$, $F(3, 244) = 17.029$, $p < 0.001$).

7.3 | Interim discussion

Study 2 has replicated the findings of Study 1 and validated the 11-item HTQ in a larger sample. CFA demonstrated that the three-factor structure of the HTQ was adequate, thus validating the 11 items subdivided into the three subscales for the final version of the HTQ. The Bayes factors and Pearson's correlations for the relationships between the HTQ, its subscales, subclinical OCD symptomatology, and the COHS, an existing measure of habitual tendencies, were then examined in order to determine the construct validity of the HTQ. There was a significant positive correlation between HTQ Compulsivity and the OCI, as in Study 1, suggesting that individuals prone to compulsivity show increased subclinical OCD symptomatology. Similarly, a significant positive correlation was found between HTQ Regularity and the Routine subscale of the COHS, suggesting that they tap into similar constructs. Hierarchical regression demonstrated that the three subscales of the HTQ explain a significant proportion of the variance in subclinical OCD symptomatology, and furthermore, revealed HTQ Compulsivity to be a significant predictor of subclinical OCD symptomatology, replicating the findings of Study 1. Therefore, the HTQ may be used as a validated tool to measure individual variation in habitual tendencies, and its subscales may be valuable in predicting subclinical traits in the general population.

8 | DISCUSSION

The present study has developed and validated a key research tool for measuring individual differences in habitual tendencies, the HTQ. Through a rigorous process of selection, 11 items were chosen for the final version of the HTQ, and factor analysis revealed that these items clustered into three factors, representing three distinct aspects of the habitual tendencies construct: Compulsivity, Preference for Regularity, and Aversion to Novelty. The three-factor structure of the HTQ was reliably maintained across two independent samples, including a preregistered replication, and a combined summative analysis (supporting information), and was shown to be able to discriminate between various features of habitual tendencies (encompassing behaviours, attitudes, beliefs and thinking styles) in healthy populations. Participants' scores on the Compulsivity subscale of the HTQ consistently showed a significant strong positive correlation with their subclinical OCD symptoms, suggesting that individuals prone to compulsive thoughts and actions in their normative daily lives show increased subclinical OCD symptomatology.

The present study highlights the importance of recognising that habits are composed of different facets that manifest in the daily lives of individuals to varying degrees, and of making distinctions between these facets. This is consistent with recent research such as that of Hardwick et al. (2019), who found a difference between the formation of habits and their expression. They propose that a stimulus triggers the preparation of a response, but that this response is not enacted immediately. Therefore, a more appropriate, goal-directed action may replace the prepared response before it can be initiated. In Hardwick et al.' (2019) study, participants practised a visuomotor association task for 4 days. They then learned a new association, but when forced to respond rapidly, habitually expressed the old association. This demonstrates a dissociation between habit formation and expression, which may be reflective of the different aspects of habitual tendencies encompassed by the HTQ, such as thinking style (HTQ Compulsivity) or attitude (HTQ Preference for Regularity), and behaviour (HTQ Aversion to Novelty).

Elucidating the underlying components of habits has important implications for our understanding of the antecedents of clinical disorders involving excessive habits, such as OCD. Dissociations similar to those of Hardwick et al. (2019) have been made in relation to different aspects of OCD, which may arise, in part, as a result of an over-reliance on habits, as well as deficits in goal-directed control (e.g., Gillan et al., 2016). The ego-dystonic nature of OCD means that patients possess the knowledge that their behaviour is irrational, and this has been demonstrated experimentally using a contingency degradation task (Vaghi et al., 2019). Although patients with OCD showed exaggerated responding compared with healthy controls, their action-outcome contingency knowledge was intact, implying a divergence between their actions or behaviours; and their knowledge, or thinking style. Furthermore, it has been suggested that the obsessions (represented by habit learning) and compulsions (represented by habit perseverance) underlying OCD may themselves be attributable to distinct systems and even neural circuitries (Robbins et al., 2019). Revisiting a PET study conducted by Rauch et al. (1998), which explored the neural correlates of factor-analysed OCD symptoms, provides support for this. Religious, aggressive and sexual obsessions, and checking compulsions (Factor 1 in Rauch et al., 1998) were positively associated with bilateral striatal activity, whereas symmetry and ordering symptoms (Factor 2 in Rauch et al., 1998) were negatively associated with right caudate nucleus activity. Washing and cleaning symptoms (Factor 3 in Rauch et al., 1998) were positively associated with activity in several prefrontal areas. The grouping of OCD symptoms into the different factors reflects the dissociation between obsessions (as Factor 1 consisted of symptoms relating to thinking style), and compulsions (as Factors 2 and 3 consisted of symptoms relating to behaviours), and the distinct neural correlates of these different dimensions reinforce the notion that OCD, and the habitual tendencies underlying it, are composed of various dimensions.

An important future direction may be to explore whether the different components of the HTQ map onto distinct neural circuitries in a similar way, as subclinical OCD symptomatology is associated with HTQ Compulsivity, but not with the other HTQ subscales.

Extensive evidence from neuroscientific studies of experimental animals and neuroimaging studies in humans has supported the concept of dual systems of behavioural control: a goal-directed system, implicating the ventromedial prefrontal cortex (vmPFC) and caudate nucleus, and a habit system that recruits the putamen and premotor regions of cortex (Balleine & O'Doherty, 2010). Compulsivity as measured by questionnaire scales in a large sample of adolescents has been linked to reduced white matter in dorsomedial and dorsolateral PFC regions, especially including the anterior cingulate cortex and the ventral striatum. Moreover, compulsive behaviour in addiction and OCD, as measured respectively by the Obsessive–Compulsive Drug Use Scale (OCDUS) and the Yale–Brown Obsessive–Compulsive Scale (YBOCS) has been linked to structural changes or dysconnectivity of the ventromedial and orbitofrontal PFC (Ersche et al., 2011; Meunier et al., 2012). One interpretation of these findings is that underactivity in these PFC circuits leads either to an imbalance in the goal-directed versus habit systems, or a dysregulated control over the striatal habit system (e.g., Hardwick et al., 2019), thus linking compulsivity to enhanced habits. Future studies should aim to link these neural studies with experimental measures of habit learning and compulsivity scales, such as OCD with habit scales such as HTQ or COHS, to validate the laboratory test paradigms against habitual behaviour in the real world. For example, Ersche et al. (2021) showed that a shift to habitual control, as assessed with contingency degradation procedure, was impaired in chronic cocaine abusers, and additionally that contingency degradation performance was positively related to the automaticity score on the COHS, which in turn in this group, was significantly related to reductions in glutamate turnover in the putamen.

Additionally, the present study demonstrated robust individual differences in habitual tendencies, which may help to explain past inconsistencies between animal and human research, and between empirical and theoretical

work. De Wit et al. (2018) attempted to induce habits in human participants using five outcome devaluation tasks, but this was unsuccessful, leading them to conclude that these tasks are mainly a measure of goal-directed control, and thus compulsive individuals perform less well in these tasks due to impaired goal-directed control rather than overactive habit learning. However, individual differences in habitual tendencies were unaccounted for in most of these experiments or deliberately cancelled out. We propose that individual differences in susceptibilities to habitual tendencies may have a significant impact on the findings, or lack thereof, in studies such as this one. A study conducted by Luijten et al. (2020) provides support for this view. This study found that although there was no difference in habitual versus goal-directed control between smokers and non-smoking controls in outcome devaluation tasks, individual differences in nicotine dependence within the smoking group were positively correlated with habitual responding after appetitive instrumental learning, modelling positive reinforcement. This emphasises the importance of individual differences in this field of research and suggests that individual variation in susceptibilities to habits must be taken into account in order to effectively manipulate habitual tendencies.

The results obtained in the present study possess important implications for future research and intervention. As the present study used an online convenience sample, replication of these findings in countries other than the United States would be useful in order to explore whether the present findings are consistent across cultural contexts. In addition, the 11-item HTQ may be used in individual difference research on habitual tendencies and their associations with other constructs, such as personality traits and political views (e.g., Zmigrod, 2020; Zmigrod et al., 2015, 2018, 2020). It may also be fruitful to extend the present findings by using existing behavioural measures of habits, such as the Fabulous Fruit Game (de Wit et al., 2007) and outcome devaluation paradigms (e.g., Gillan et al., 2011), as well as measures of goal-directed control, such as contingency degradation paradigms (e.g., Vaghi et al., 2019), in conjunction with the HTQ in order to strengthen the reliability and validity of the present findings and to contribute to theories that try to understand the causal mechanisms that make some individuals more susceptible to habitual tendencies, and more specifically, to compulsive thinking. It has been suggested that many of the supposed behavioural measures of habits in fact measure impaired goal-directed control (De Wit et al., 2018), and as such, there may be a need for the development of novel behavioural paradigms that measure habits more specifically. In addition, there may be a role for the administration of other cognitive tasks, such as the Alternative Uses Task (Guilford, 1967; Ionescu, 2012; Zmigrod et al., 2019), along with the HTQ, to improve our understanding of how individual variation in cognitive inflexibility may moderate habitual tendencies, and contribute to disorders involving these traits (Ramakrishnan et al., in prep). Indeed, this is particularly important given the diversity of definitions offered for compulsivity and the endeavour to create a dimension-based psychiatric approach to compulsive disorders and behaviour (Albertella et al., 2019; Dajani & Uddin, 2015; Luigjes et al., 2019).

Another important future direction would be to explore relationships between the HTQ and various clinical disorders associated with habits (Gillan et al., 2014; Gillan & Robbins, 2014; Gillan & Sahakian, 2015). This could be achieved by administering the HTQ to those with clinically diagnosed OCD, as well as to alternative populations of individuals with disorders involving compulsivity, such as addictions and binge eating disorders, which have been suggested to involve 'deficits in goal-directed control and associated over-reliance on habits' (Gillan et al., 2016, p. 836). Another disorder that may be of interest to study in relation to habitual tendencies is autism and autism spectrum disorders, as the present study found a significant positive correlation between the HTQ and the Autism Quotient (Allison et al., 2012), (see supporting information, Additional Analyses and Table S5) and there is often comorbidity between OCD and autism, as well as overlap in their symptomatology (Leyfer et al., 2006). Thus, future investigations may identify convergences and divergences in patterns of habitual tendencies across different clinical disorders.

To conclude, the present study developed and validated a novel, representative measure of habitual tendencies, the HTQ, which has good reliability and validity. The HTQ may prove useful in future research into habitual tendencies, including in relation to compulsivity disorders such as OCD, potentially contributing to the development of interventions targeting the maladaptive habits proposed to underlie OCD. To return to William James's *Habit* (1890, pp. 3–4), it 'thus appears that habit covers a very large part of life, and that one engaged in studying the objective manifestations of mind is bound at the very outset to define clearly just what its limits are'.

ACKNOWLEDGEMENTS

We would like to acknowledge Bushra Zafar, Paul Matthews and Chessie Broadhurst for research assistance and help in developing the Habitual Tendencies Questionnaire. This research was made possible through a Gates Cambridge Scholarship and a Junior Research

Fellowship by Churchill College, Cambridge, to Leor Zmigrod, and a Wellcome Trust Senior Investigator Grant 104631/z/14/z to Trevor Robbins.

CONFLICT OF INTEREST

There are no conflicts of interest.

ETHICS STATEMENT

Ethical approval for the study was acquired from the Department of Psychology Ethics Committee of the University of Cambridge. In line with the Declaration of Helsinki (1964), electronic informed consent was obtained from all participants before beginning the survey, and participants were notified that they may terminate their participation in the study at any point.

DATA AVAILABILITY STATEMENT

Data will be provided upon request.

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SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of this article.

How to cite this article: Ramakrishnan, S., Robbins, T. W., & Zmigrod, L. (2021). The Habitual Tendencies Questionnaire: A tool for psychometric individual differences research. *Personality and Mental Health*, 1–17. https://doi.org/10.1002/pmh.1524

APPENDIX

ELEVEN-ITEM HABITUAL TENDENCIES QUESTIONNAIRE

HTQ compulsivity

HTQ 37: I tend to dwell on the same issues
HTQ 36: I mentally fixate on certain issues and cannot move on
HTQ 35: The same thoughts often keep going through my mind over and over again
HTQ 33: I tend to repeat actions because I keep doubting that I have done them properly

HTQ preference for regularity

HTQ 10: I like to have a regular, unchanging schedule
HTQ 9: There is comfort in regularity.
HTQ 27: A good job has clear guidelines on what to do and how to do it
HTQ 1: I hate it when my routines are disrupted

HTQ aversion to novelty

HTQ 30: I look forward to new experiences R
HTQ 26: Life is boring if you never take risks and always play it safe R
HTQ 7: When eating at restaurants, I like to try new dishes rather than ones I have tried before R