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A qualitative investigation of individuals' lay representations of habit

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ABSTRACT

Objective: While there have been substantive advances in the conceptualisation, measurement, and effects of habit as a psychological construct, there is limited research on individuals' beliefs and perspectives on habit. The current investigation reports the findings of two studies purposed to explore individuals' lay representations of habit which further inform habit theory and measurement, and interventions designed to promote habits.

Methods: Study 1 ($N = 158$) used an online, open-ended questionnaire to elicit lay beliefs on the salient features of habit. Study 2 ($N = 27$) involved a series of interviews and focus groups to further explore individuals' representations of habit.

Results: Thematic content analysis revealed that participants described habit in terms of its content, salient features or characteristics, and function or consequences. The results also indicated that while collective knowledge converged on expert perspectives, few individuals identified all or most features of habit, suggesting individuals' beliefs are incomplete.

Conclusions: Current findings indicate that lay people as a collective hold consistent but largely 'patchy' beliefs about habit. Future research should focus on integrating the beliefs identified in this research with new measures of habit and habit interventions.

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Behavioural automaticity; lay representations; past behaviour and routines; cue-behaviour association

Introduction

Habit as a concept has a long history in the scientific literature (Barandiaran & Di Paolo, 2014; James, 1890; Triandis, 1977). Definitions of habit can be identified as far back as Aristotle in the Classical period. It is only relatively recently that researchers studied habit as a psychological construct, outlined its defining characteristics, described how habits are formed and broken, and specified the mechanisms by which

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habits affect future behaviour (for reviews of these perspectives, see Barandiaran & Di Paolo, 2014; Fleetwood, 2021; Gardner, 2015; Wood & Rünger, 2016). Advances in scientific theory and research on habit has provided some conceptual and empirical convergence on certain key characteristics of habits and outlined how they are implicated in the initiation and enactment of behaviour (Aarts & Dijksterhuis, 2000; Gardner et al., 2021; Verplanken & Orbell, 2022; Wood & Rünger, 2016). By contrast, there is relatively little research that has investigated how individuals typically describe and represent habit as a concept and their experiences of habitual behaviours. Further, while there has been some prior research examining individual's commonplace or 'lay' theories of psychological phenomena (e.g. Böhm et al., 2015; Darker & French, 2009; Keatley et al., 2017) there has been a general neglect of research on lay perspectives of psychological constructs, including habit (Gardner, 2015; Verplanken & Orbell, 2003; Wood & Rünger, 2016).

This relative dearth of research represents a key evidence gap given the potential for lay representations of psychological constructs to have pervasive effects on individuals' responses to measures of constructs, particularly given the general reliance on self-report methods of measurement, as well as their responses to techniques and methods designed to affect change in these constructs through intervention. Accordingly, research that assists in detailing the content and interpretation of individuals' lay beliefs about these constructs may provide important formative evidence that can feed-forward into the development of measures and interventions, and also assist psychological scientists more broadly in the development of conceptual bases and theory on psychological phenomena.

In the current research, we investigated people's lay representations of habit as a construct. First, we outline scientific definitions and conceptualisations of habit that may contribute to informing an understanding of the lay representations of habit. We then describe how lay people's representations of habit may help inform theories of behaviour as well as describe the extent to which these lay representations of habit diverge from scientific or expert-determined definitions of habit, which, in turn, may contribute to habit intervention and measurement development. To do so, we conducted two studies adopting open-ended questionnaire (Study 1) and in-depth interview and focus group (Study 2) methods. Findings are expected to inform the future study of habit measurement, such as the extent to which individuals' representations may affect or bias their responses to habit measures, and assist in developing interventions designed to promote adaptive habit formation or break unwanted habits by identifying components of habit that individuals consider most salient.

Contemporary approaches and theory on habit

Habit has received considerable attention in research in the behavioural sciences, particularly psychology—such attention is warranted given the general observation that many of the behaviours that individuals perform, including those in the health domain, are highly invariant across context and time (Fleetwood, 2021; Gardner, 2015; Wood & Rünger, 2016). Interest in habits is also piqued because habits can have both adaptive (e.g. better health outcomes and psychological well-being) and maladaptive (e.g. poorer health outcomes and ill-being) consequences, particularly in the health

domain. As such, insight into the defining characteristics and drivers of habits may provide useful information on how habits are formed and broken, and the kinds of strategies that might be adopted by interventionists to promote habit formation for adaptive outcomes and break habits that are linked with maladaptive outcomes. Eschewing early approaches to habit that were primarily descriptive and focused on habit as behavioural consistency or inferred habitual processes from the effects of past behaviour alone, recent conceptualisations have focused on habit as a psychological construct that encompass representations of the mental processes involved in habit formation and enactment. This approach has advanced knowledge on habit by providing clarity in its definition and provides some potential resolution with conceptualisations of habit that focus on habit exclusively on a behaviour or a cause of behaviour (Fleetwood, 2021; Gardner, 2015; Maddux, 1997; Verplanken & Orbell, 2003).

Contemporary definitions of habit as a construct, therefore, tend to focus on habit as a mental representation of cue-behaviour associations with some key defining characteristics and associated effects and outcomes. Habits are considered mental representations of associations between action and contextual or situational cues that lead to rapid, automatic enactment of the action on presentation of the cues (Fleetwood, 2021; Gardner, 2015; Verplanken & Orbell, 2022; Wood & Rünger, 2016). Alongside the covariance of behavioural frequency and stability of contextual cues (e.g. Danner et al., 2008; Galla & Duckworth, 2015; Wood & Neal, 2009), researchers have also proposed a number of other key features or consequence of habit including behavioural accessibility (e.g. Verplanken et al., 1994) and the tendency for habitual behaviours to be experienced as automatic, unthinking, and routine (e.g. Gardner et al., 2011; Verplanken & Orbell, 2003). Such features have been reflected in the types of measures that researchers have developed in order to measure habits. These have included measures that focus on the interaction between frequency of behavioural performance and the stability of the context or environmental conditions that give rise to the behaviour (e.g. frequency x context; Wood & Neal, 2009), heightened accessibility of behavioural responses to typical scenarios (e.g. response frequency measures; Verplanken et al., 1994), and experience of habitual behaviours as automatic, unthinking, and routine (e.g. self-reported habit measures; Verplanken & Orbell, 2003).

These self-report habit measures have gained prominence in the research, particularly in the domain of health behaviour. Such research has supported the construct (Gardner et al., 2012; Hagger et al., 2023), concurrent (Hagger et al., 2023), predictive (Brown et al., 2021; Ma et al., 2023; Phipps et al., 2023; 2024; Simpson-Rojas et al., 2024), and nomological (Gardner et al., 2012; Hagger et al., 2023) validity of habit measures broadly across health behaviour contexts. In addition, researchers have also employed such measures to provide evidence that corroborates important predictions of theories on habit. For example, studies have demonstrated that effects of habit measures on behaviour tend to be larger, and intentions smaller, for behaviours that have a greater propensity to be formed as habits, and habit effect smaller and intention effects larger for habits that are higher in complexity (Hagger et al., 2023). Similarly, habit measures are more likely to have larger effects on behaviour under conditions of habit discontinuity, such as when events or conditions lead to disruption in the contingency between the habitual behaviour and the conditions that give rise to the behaviour (Verplanken 2018; Verplanken & Roy, 2016). In addition, habit

measures have also been employed to demonstrate change in habit development in the context of exposure to manipulations or intervention strategies aimed at fostering habit through greater routinization of behaviour (Lally et al., 2010) or development of stronger behaviour-cue consistency (Orbell & Verplanken, 2010) or those aimed at breaking unhealthy habits through disruption (Adriaanse et al., 2011; Verhoeven et al., 2013). Taken together, advances in theory and measurement of habit as a construct has delivered important advances that corroborate theoretically-consistent habit effects.

A rationale for examining lay representations of habit

The convergence of findings of research adopting self-report measures of the habit construct notwithstanding, there have also been prominent critiques. Central to these has been issues surrounding individuals' capacity or awareness of the control over their behaviours leading to potential misattribution of their experience of behaviours as automatic or routine when responding to habit measures. Such behaviours may, instead, be enacted with extensive deliberation and without having been developed as habits (Hagger et al., 2015; Sniehotta & Presseau 2012). Such misattributions could lead to increased error in research on habits, which may lead to potential inaccuracies in conclusions. For example, this may have introduced a level of error to conclusions of research concerning the speed at which health behaviours are developed as habits (Lally et al., 2010), or in the extent to which individuals have truly adopted behaviours as habits as a consequence of interventions designed to do so (Gardner et al., 2023). Such inaccuracies may lead to imprecision in the emphasis on the types of habit components that should be targeted in interventions or incorrect conclusions as to the extent to which individuals have acquired behaviours as habits, leaving habits for such behaviours at greater risk of being discontinued or 'broken' after exposure to disrupting conditions (Verplanken & Roy, 2016).

Research has suggested that individuals tend to underestimate the important downstream effects of habits (Mazar & Wood, 2022). Many individuals attribute their habitual behaviour *via* post-hoc rationalisation, stemming from observing their motives in the context that they occurred. Accordingly, people may tend to over-emphasise the extent to which their actions are attributed to volitional processes; that is, are a function of their motivation or intentions, especially when the behaviour is aligned with personally-valued goals, and under-estimate the extent to which such behaviours are attributable, or controlled by, automaticity or habit-related processes (Armitage, 2005; Ji & Wood, 2007; Neal et al., 2012). For example, research has indicated that participants who regularly attended a newly opened gym continued to believe their goal-aligned behaviour was driven by their motives despite only trivial effects of their intentions on behaviour after an extended period of performing it consistently and in the same context (e.g. regularly attending a gym after the fifth week after initial enrolment; Armitage, 2005). Interestingly, the participants' intentions simultaneously increased while they continued to go to the gym, despite not being predictive of behaviour relative to habit. Similarly, Mazar and Wood (2022) found that while the role of habit better explained variance in individuals' behaviour, participants tended to overemphasise their inner states (e.g. fatigue) as the cause of their behaviour.

Interestingly, an exception to this pattern of effects may be when individuals' behaviour is driven by a clear, unambiguous internal cue that results in goal-independent behaviours (e.g. eating a high-calorie chocolate bar when attempting to lose weight). When an individual's behaviour is misaligned with their goals, they may be more inclined to report external or automatic processes as responsible (Adriaanse et al., 2014). Interestingly, computational models have indicated that stimulus-driven habitual responses can become active goal representations; that is, goals can be a consequence and not just a precursor of habitual behaviour (Wood & Rünger, 2016). While inaccurate inferences of individuals' behaviour has few, if any, negative implications to daily living, it becomes increasingly important when individuals attempt to change their behaviour and highlights the need to gather data on individuals' lay perspectives of habits in order to further develop habit theory and provide an explanation of how individuals rationalise the causes of their behaviour. Exploring lay beliefs of habit will, therefore, contribute to habit theory by identifying beliefs that may elucidate how individuals understand the causes of their behaviour.

A contributing factor to this imprecision may be the extent to which individuals are able to comprehend, assimilate, and interpret information that reflects key features of habitual behaviours in health contexts in self-report habit measures. Concerns over the limitations that respondents experience when interpreting items from self-report measures have been highlighted in critiques of habit measures (Hagger et al., 2015; Sniehotta & Presseau 2012). Parallels for such concerns have also been noted in analyses of measures of other psychological constructs. For example, researchers have used 'think aloud' approaches to garner information on how people make sense of measures of the psychological constructs typically identified in theories of behaviour change as determinants of behaviour such as attitudes or self-efficacy (e.g. Darker & French, 2009; French & Hevey, 2008). Such approaches have revealed that although there may be some congruences in general aspects of how such constructs are represented by scientific theorists and lay people who tend to make up participant groups of studies and target audiences of interventions, there are also clear variations, such as a lack of clarity and full understanding of the underlying construct and drawing on different sources of information to inform the content of the construct. Gardner and Tang (2014) used this approach and found key misinterpretations of the automaticity component of the Self-Report Habit Index (SRHI; Verplanken & Orbell, 2003) among participants. They noted that such misinterpretations raise the question of the sensitivity of such measures and further highlight the need to identify a more expansive understanding of lay representations of habit and to explore new ways of measuring habit.

Exploring lay beliefs of habit will contribute to the development of habit measures, particularly given individuals' limited capacity to correctly attribute the causes of their behaviour. It may, for example, be more useful to incorporate scenarios or vignettes into self-report habit measures to orient participants to consider the likely causes of their behaviour. Some researchers have started to explore novel ways of assessing habits, including incentivising participants for accuracy (Mazar & Wood, 2022). Identifying the beliefs that individuals hold about habits may provide the requisite knowledge to develop measures that provide accurate accounts of the likely contribution to habit on behaviour.

Another related means to gather information on how lay audiences may represent the habit construct is to adopt on a 'common-sense' approach which aim to capture lay individuals' beliefs toward, and common language usage of, the construct of interest. There is precedent for the adoption of this approach to measurement of psychological constructs. For example, research examining individuals' representations of illness have focused on individuals' 'common sense' reflections on aspects of an illness of condition that affects them (Hagger et al., 2017; Hagger & Orbell, 2003; Leventhal et al., 2016). Measures adopting such an approach focus on soliciting individual endorsement of implicit or lay representations of behaviour, based on open-ended research eliciting the common components of illness that individuals typically cite, such as the cause, consequence, symptoms or identity, and timeline. These are considered essential because it is individuals' lay beliefs regarding their illness, rather than the level of expert or formal knowledge, that is expected to affect their responses and behaviour with respect to coping and managing the illness (Moss-Morris et al., 2002; Weinman et al., 1996). Similarly, eliciting salient lay representations of habit may help identify the components of habit of which individuals are aware and likely affect their responses to meta-cognitive habit measures that prompt individuals to reflect on their habits such as the SRHI.

Identifying lay representations of habit may also inform interventions to promote the maintenance of health behaviours and the breaking of habitually performed unhealthy behaviours. Given people have biases in accurately identifying the causes of their behaviour, this may interfere with individuals' capacity to self-identify effective strategies to develop and maintain a desired behaviour or cease an undesired behaviour. For example, if an individual attributes the fatigue as the cause of their habitual consumption of coffee or energy drink consumption behaviour, they may attempt to improve sleep quality or amount of sleep time and undervalue the context-driven performance of the behaviour itself (Mazar & Wood, 2022; Wood et al., 2022). Exploring the representations that lay people hold of habits may help identify strategies that may, potentially, assist individuals in managing the habitual behaviour itself rather than seeking to change others. For example, it may signal the necessity of highlighting adoption of potential strategies that may assist in breaking the cue-behaviour link for the undesired behaviour, such as identifying fatigue as a cue to coffee or energy drink consumption and displacing it with an alternative.

The present study

The overarching aim of the current investigation was to explore how lay people represent habit as a construct. Specifically, we report two studies aimed at eliciting lay people's definitions and conceptualisations of habits by asking participants to reflect on the defining features of habit and their beliefs on salient processes relating to habits such as conditions or determinants of how habits are developed, maintained, and broken. The first study used an online, open-ended questionnaire to elicit lay people's beliefs on the salient features of habit, and the second study involved a series of interviews and focus groups in which individuals were prompted to discuss their representations of habit, including the kinds of behaviours participants identify as habitual and the processes that lead to the development, maintenance, and breaking or discontinuity of habits.

Table 1. Sample demographic characteristics of participants in Study 1 Survey and Study 2 Interviews and Focus Groups.

Variable	Study 1: Survey	Study 2: Interviews and Focus Groups
Participants, *N*	158	25[a]
Sex (%)		
Male	19.60	33.30
Female	79.70	64.00
Other/non-disclosed	0.60	4.00
Age, *M* years (*SD*)	30.47 (13.90)	29.96 (11.70)
Education level (%)		
Junior/senior school	36.10	20.00
TAFE/Diploma	12.70	48.00
Undergraduate degree	22.80	16.00
Postgraduate degree	28.50	8.00
Non-disclosed/missing	0.00	8.00
Ethnicity (%)		
Caucasian	79.70	80.00
Other	19.00	20.00
Non-disclosed/not reported	1.30	0.00

[a]Two participants chose not to answer the demographic questionnaire.

Methods

Participants

Participants were a convenience sample of adults recruited online through social media, the University broadcast email system, and the School's research pool for the opportunity to receive course credit. Study 1 comprised 158 participants (79.7% female, aged between 17 and 75 years) and Study 2 comprised 10 participants interviewed individually, and 17 participants who were interviewed in seven focus groups (64.0% female, aged between 18 and 65 years). Partial credit was provided to participants from the research pool and no incentive or compensation for study involvement or completion was provided to other participants. None of those giving consent to participate in the study later dropped out. Sample demographic characteristics are presented in Table 1. Compared to national demographic data, the current samples had more female participants and higher education levels. Participants were assumed to be non-experts in habit theory and research given they had neither received formal training in psychology or been involved in prior research or studies on habit.

Design and procedure

The current investigation adopted an interpretivist approach to describing and interpreting lay (i.e. non-expert) individuals' representations of habit (Green & Thorogood, 2018). The Consolidated Criteria for Reporting Qualitative Research (COREQ) checklist (Tong et al., 2007) and the APA Journal Article Reporting Standards for qualitative research (JARS-Qual; American Psychological Association, 2019), guided the conduct and reporting of the research (see Appendix A, supplemental materials). Approval for study procedures was granted prior to data collection from the Institution Human Research Ethics Committee. Study 1 data were collected on a single occasion using online survey software (Qualtrics™). Participants were asked 'how would you describe

a habit' and were provided an open, multi-line, text entry box with the stem 'a habit is…'. One, broad, open-ended question was used to elicit participants' initial, most salient responses which was expected to identify the components of habit participants deemed most salient (Reja et al., 2003).

For Study 2, a semi-structured interview guide was developed using open-ended questions to explore participants' representations of habit with accompanying probing questions (Table 2). It was expected that this approach would produce data that most accurately presented participants' lay perspectives. The interview guide was reviewed by all authors and pilot tested on three participants. Pilot participants' responses were subsequently used to adapt the interview guide with respect to question clarity and appropriateness. Interviews and focus groups lasted between 20 and 60 min (average duration between 30 and 40 min). We anticipated that we would require between 15 and 25 participants to extract common themes on habit definition, development, and understanding based on recent research providing guidance on sample size for qualitative research (Hennink & Kaiser, 2022). This was reviewed in a preliminary analysis once data on the lower threshold of participants were collected to ensure an appropriate breadth of lay representations was identified from the responses. Participants had the option of a telephone or face-to-face interview modality, and could be interviewed individually or in small groups. Face-to-face interviews or focus groups were conducted in a dedicated research space at the host institution, telephone interviews were exclusively individual, while face-to-face modality were either individual or and focus group interviews. Author DB, a male doctoral candidate and clinically trained psychologist, conducted all interview and focus groups. All participants were notified that the study was a component of DB's doctoral research at the time of the interview. All authors have previously conducted research or written commentaries regarding the role of habit as an automatic process in health behaviours that likely shaped their interpretation of the data generated in the current study.

Participants provided informed consent for their interview to be audio-recorded and later transcribed for research purposes only. Notes were taken by interviewer DB during each interview or focus group to aid further exploration of relevant ideas

Table 2. Summary of interview guide for Study 2.

Question	Suggested Prompt
Why don't we start by you telling me what type of habits you have?	
Can you tell me any habits related to health behaviours?	For example, brushing your teeth or exercising?
What aspects of that behaviour makes you think it is habitual or a habit?	So you've said X and Y make this behaviour a habit. Can you think of any other characteristics of habits?
So you've described all these things which make a habit. Can you tell me the difference between behaviours that aren't or can't become habits?	For example – can giving blood/immunisations/ screening behaviours become a habit? What is the difference between these and the behaviours you said can/are habits?
You described all these characteristics of what a habit is. Can you tell me what, if anything, is then the difference between a habit and a routine? What are the different characteristics?	Can you provide me some examples of routines (which aren't habits)?

Note: Participants were provided with the following instructions prior to data collection: 'Thank you so much for participating today. I'm going to ask you a range of questions about what your understanding of habits are. I'm trying to understand what Australian's know about habits so I'm not expecting any particular "correct" answers'.

expressed. The notes were neither used in data analysis nor were they provided to participants (Ortlipp, 2008).

Analytic strategy

For both Study 1 and Study 2, data were analysed using thematic content analysis (Braun & Clarke, 2006, 2013; Joffe & Yardley, 2004) aided by the Nvivo 12 qualitative analysis software. Prior to analysis, complete transcripts of the individual interviews and focus group interviews were imported into the software and checked for accuracy and completeness against the original audio. Data from each study were analysed separately, with the analysis for Study 1 completed prior to the completion of data collection for Study 2. As a consequence, results of Study 1 were neither affected by, nor directly informed, data collection for Study 2. This method was selected as it is guided by existing theory as well as the perspective and disciplinary knowledge of the researchers. Specifically, for both studies, our data were analysed in accordance with the six phases set out by Braun and Clarke (2006, 2013).

The theoretical concepts informing the interpretation of the coding were based on the authors' prior knowledge of habit theory, structure, and the extant research and from a descriptive analysis of the multiple habit definitions identified in a prior review of habit applied to health behaviour (Gardner, 2015). Specifically, the analysis identified three main components of habit as a psychological construct: the content (e.g. a mental representation of links between actions and contextual or situational cues), salient associated features (e.g. the automaticity of the impulse or act, stimulated by a stable cue/context, which may be goal independent), and formation process (e.g. *via* repetition over time and reinforced through rewards) of habit. These themes were used to inform identification and organisation of the themes identified in the analyses of each study in the current research. Author DB conducted initial coding of the data using specific words or phrases stated by participants for relevant chunks of data. These initial codes were then allocated to relevant themes relevant to the components of habit identified in our initial analysis of Gardner's (2015) review, and to additional unique themes that were not covered by those identified from our analysis. Codes and themes were reviewed independently by author KH and inconsistencies resolved *via* discussion with codes adjusted and reallocated according to the consensus arising from the discussion. Participants were not provided the opportunity to review or comment on themes.

Results

Study 1

Participants described habits in terms of its operational definition (e.g. an explicit pattern of behaviour or outcome or as an internal mechanism), its components and defining features (e.g. it is enacted automatically and repeated), and their evaluative judgments on habit function (e.g. as either 'good' or 'bad' with respect to their outcomes, or both), as shown in Figure 1. Participants' answers provided an important first step in characterising lay people's representations of habit and what they perceive as its most salient features and defining characteristics.

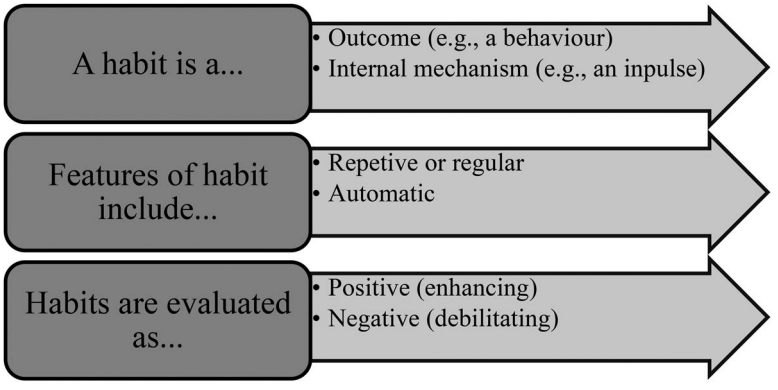

Figure 1. Overview of themes identified in Study 1.

What is a habit?

The open-ended question began with the stem 'a habit is…'. A majority of participants ($n = 74$) specifically identified a habit as *an outcome*, that is a behaviour or an action (e.g. a pattern of behaviours, an activity, a thought, a task, a conduct, an emotional reaction). A smaller number of participants ($n = 14$) identified that habit is *an internal mechanism* using terms or phrases such as habit is '…a tendency', '…a practice', or '… an impulse'.

Features of habit

Two prominent features of habit were identified in the open-ended survey responses. The first was that a habit is *repetitive* ($n = 122$). Participants described habit as an action or behaviour that is 'repeated', engaged in with some degree of 'regularity', and is 'routinely' enacted, or done 'frequently' ('an action regularly repeated'; 'something you do consistently [either daily, weekly])'. Some participants ($n = 13$) also indicated that habits are 'developed over time', which suggests a belief in the necessity for repeated action is required to develop. For example, one participant wrote that a habit is 'an unconsciously enacted behaviour…learned through repetition, over time', while another wrote a habit is 'something someone does often after a long period of time doing it…'

Another common feature identified by participants was that habits are defined by their automaticity and the absence of the need for conscious or deliberate thought. Many participants ($n = 85$) defined habits in terms of being 'thoughtless', 'unconscious', or 'automatic' as well as 'compulsive', 'instinctively done', 'uncontrolled', and enacted 'without knowing'. For example, one participant wrote, a habit is… 'an action or thought that is repeated 'automatically'; that is, with little conscious thought/attention to it'. Automaticity was also inferred when participants described habits as 'difficult to stop' ($n = 19$).

Evaluation of habit

A small number of the participants ($n = 9$) specifically provided a subjective evaluation of the function or consequence of habit (i.e. whether habits have positive or negative functions or outcomes). All but one of the participants who provided an evaluation

specifically described how habits can be both positive or negative. For example, one participant wrote, 'habits can be good (like taking the stairs instead of the lift) or bad (like chewing your fingernails)', while another wrote, 'something that you do or practice regularly, which may or may not be beneficial to your health'.

Study 2

In Study 2, participants across 10 interviews and seven focus groups were asked to reflect on their own habitual behaviours. In their descriptions they offered three broad characterizations of habit: by the characteristics of behaviours they identified as habits (e.g. simple, discrete behaviours; repetitive behavioural patterns synonymous with routines; self-identity characteristics), by its defining components or features (e.g. automatic; frequent; stable cue/context; and emotionally rewarding), and by their evaluations (e.g. habits as 'good' and consistent with goals or 'bad' and inconsistent with goals). These themes are summarized in Figure 2. Participant responses are summarised below and provide an in-depth description of how lay people characterise habit. Details of identified themes and associated representative interview or focus group quotes for participants' characterisations of habit outlined above; namely, habitual behaviours, features of habit, and evaluations of habit, are outlined in Table 3.

Habitual behaviours

When reflecting on habitual behaviours, participants described habits as either a discrete behaviour; that is, repetitive patterns of behaviour, synonymous with routines (Clark, 2000; Ersche et al., 2017); or to represent a characteristic of their identity. When participants were asked to reflect on the behaviours they would describe as habits, they tended to indicate that habits were primarily discrete, single-step, behaviours such as 'biting my nails' or 'having my morning coffee'. Participants also described repetitive patterns of behaviour and used the word 'routine' interchangeably such as 'sleeping habits - the things I do before I go to bed', and 'my morning routine'. Participant descriptions of these behavioural patterns often had an implied goal, purpose, or function (e.g. getting ready in the morning or going to sleep at night), but indicated that these were made up of multiple coordinated sets of actions. Third, some participants used the word habit to described personal behavioural characteristics that reflected an important aspect of their identity, similar to what is found in

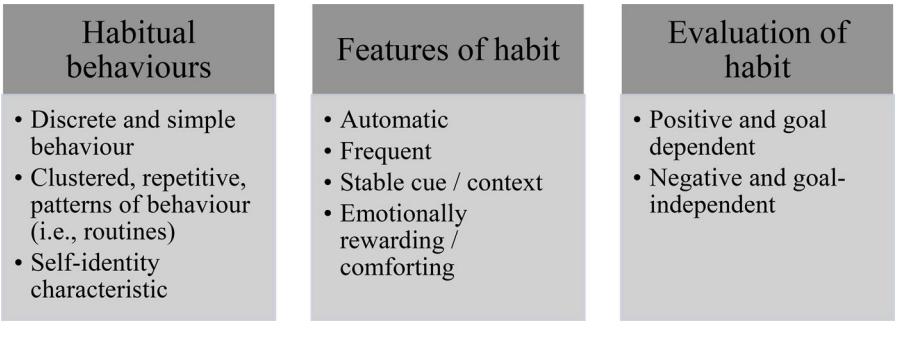

Figure 2. Overview of themes identified in Study 2.

Table 3. Representative participant quotes from Study 2 Interviews and Focus Groups.

Quote number	Participant quote	Interview (I) or focus group (FG) number
Q1	I think habit would be some sort of behaviour that you do without thinking	I8
Q2	Well I think that if you have to actively remember to do it, and remind yourself to do it, or have someone remind you to do it or you have to think about doing it, that's not really a habit	FG3
Q3	because a habit to me is really like the continuity of action, of doing something over time	I6
Q4	…a habit is something I would classify I do on a regular basis	FG1
Q5	The things that I do constantly every day, every week, every month, whatever, those sorts of things [are habitual]	FG4
Q6	If I come home [I] game at a particular hour. I pretty much do it roughly around the same time for roughly around the same amount of time that I'm playing	FG5
Q7	I'll always brush it after breakfast, in the morning. I always brush it last thing before I go to bed, so I don't eat anything before going to bed.	I8
Q8	…it's like a behaviour that's usually triggered by an emotional response, but sometimes it's a hidden emotion	FG3
Q9	I say it's a habit… because it stems from a stimulus… so it's like, for example, with the nail biting over a stressful situation, the habit is to bite my nails because it's what I always do	I7
Q10	[there are] habits of just brushing your teeth, eating breakfast, having a coffee, I think that's just something that's related to routine that you just do it automatically every day	I5
Q11	habits…are soothing or comforting or reassuring, things that you go to without thinking to… put you in a better state maybe	I1
Q12	…let's say studying for example…you're going to study from 5:00 to 6:00 pm, you're not going to enjoy it, but you know it is a necessity. It's still a habit	FG5
Q13	…if you persist long enough you start to feel that the day that you don't exercise you'll feel, 'oh, something isn't right'…your body only feels satisfied once you've engaged in the exercise…When you don't do it something is missing	I4
Q14	…we weren't eating very good, so we've tried to make it a habit of blending vegetables in a drink [in the morning], and I think now whenever I don't have that in the morning it feels wrong	FG7
Q15	I think there's two different types of habits. First there's the emotional response ones, but there's also the ones that you work towards becoming an automatic thing that you just do at that point in time, or after something. It just becomes something that you work towards not thinking needing to do about it	FG3
Q16	I think the difference between habits and routines is that habits are singular, whereas routines are multiple things strung together	I7
Q17	[my] morning routine is my habit of meditating and getting up and making my child's bottle and then brushing my teeth. Those are daily habits that I have that are in my routine	I8
Q18	My bedtime routine would be I do my physio and then I have a shower and go to bed. But, some nights I might not have a shower because I'm too tired or I had a shower in the morning or whatever	FG9
Q19	There is more flexibility with routines when event though most people don't think about them, you could, whereas habit is more automatic than that	I8
Q20	A habit like I bite my nails or whatever, it's very…you get some gratification out of it or something like that. It's a stronger feeling	FG4
Q21	[a routine] is based on necessity like, you've to take your kids to school, you've got to go to work. Whereas habits are more…it's the behaviour you fall back into	FG7

the SRHI (Verplanken & Orbell, 2003). For example, one participant described how they 'habitually' used poor grammar while another one identified as a 'dog-walker'. While walking a dog could be a habit by both a scientific and lay definition of habit, the participant did not refer to walking a dog in this way (i.e. a triggered response) but as a characteristic of their identity.

Features of habit

Consistent with Study 1, participants in eight of the interviews and all seven of the focus groups described habitual behaviour as being enacted automatically, that is 'without thought', or 'unconsciously'. Automaticity was seen as a defining difference between habitual behaviours and other non-habitual behaviours when participants were probed to describe when they believed a behaviour had moved into being habitual.

In all but one of the interviews and focus groups, participants described habitual behaviour as being repetitive over time. When describing the concept of repetitiveness, participants would describe this as being synonymous with frequency or regularity. The idea of repetitiveness meaning any behaviour that is performed in a patterned way was also identified as one that was habitual. Participants elaborating that these behaviours are those performed repeatedly at set times and days every day, week, or month.

In four of the interviews and six of the focus groups, participants indicated the presence of a stable cue or context as an important feature of habit. For example, when describing their habitual computer-gaming, one participant described the consistency of the context by stating they gamed both at the same time and for the same amount of time each day. Similarly, another participant reflected on the consistent times they habitually brush their teeth, each morning and evening. Some participants described how particular cues prompted a habitual response. Other participants described the cue-response or prompted feature of habits by describing how habitual behaviours can be performed within a routine (i.e. one behaviour is the prompt for the next behaviour in the sequence).

Habits were described as emotionally rewarding or comforting by participants in four of the interviews and five of the focus groups. These participants suggested that habits may be formed because it provides instant gratification or because it serves a function such as an emotion regulation strategy (e.g. biting nails when feeling anxious or drinking soda when feeling tired). However, some participants did not believe this was a necessary condition of habits. Interestingly, another participant similarly described how some behaviours, such as strenuous physical activity, can initially feel unpleasant when trying to form the habit yet must feel satisfying because if they did not do it, they would feel something is missing.

Evaluation of habit

As with Study 1, some participants described both positive and negative evaluations to habitual behaviours. Some of the participants in the interviews and focus groups went further and described how the 'positive' habits were typically consistent with goals, while the 'negative' habits were inconsistent with goals. For example, one

participant reflected specifically on forming a nutrition-based habit to promote the health of their family. Another participant reflected how they believed that it is often the emotionally cued habits that are 'bad' and therefore counter to their goals.

Discussion

Scientific models and theories of habit include features that impact on the way the construct is conceptualised, operationalised, and measured, and the extent to which habits impact behaviour, as opposed to more consciously-controlled, reasoned processes, and can be changed, broken, or modified through intervention. However, scientific approaches have tended to neglect individuals' lay representations of habit. In the current research, we aimed to fill this evidence gap by exploring non-expert individuals' lay representations of habit in two studies adopting qualitative research methods. The research follows prior research examining lay representations of psychological constructs and 'think aloud' research purposed to identify the mental processes that guide individuals' responses to self-report measures of constructs. As a rationale for the current research, we propose that identifying and describing individuals' lay representations may contribute to further informing habit conceptualisation and theory, and improve habit measurement and habit-based interventions. Prior research has shown that individuals do not have full insight into the causes of their behaviour and may tend to overestimate the role of intrapersonal causes such as motives and intentions (Mazar & Wood, 2022; Wood, 2024). Exploring lay beliefs of habit may provide further insight into the extent to which individuals are aware of, or have access to, their habitual behaviours, which can inform habit measurement. In particular, this can inform commonly used self-report habit measures, for example, and whether individuals can access and precisely report the controlling factors that inform their habitual behaviours and whether their lay beliefs about habits may bias their perspectives. For example, providing vignettes with a self-report habit measure may help study participants focus and reflect on the causes of their behaviour when responding. Similarly, identifying beliefs that are not aligned with scientific approaches to habit may help clinicians efficiently educate their clients or research participants on the purpose and design of their interventions.

Current findings revealed a number of similarities between participants' lay representations of habit and scientific perspectives. Specifically, some participants tended to describe habit as a psychological process or impulse, while others described habit as an outcome, such as a behaviour or response itself. The latter suggests that some individuals equate habits with the behaviour itself, rather than as a construct. This may, therefore, mean individuals have gaps in their knowledge as to the psychological causes and processes that line up their habitual behaviour, which may mean that individuals may not fully understand the rationale behind interventions designed to change or break 'bad' habits by, for example, changing or interfering with the cue-response link integral to habit formation or maintenance. For example, studies have indicated that participants in a weight-loss intervention program struggled to identify effective cues or contingent contexts that line up their weight-loss behaviours across multiple contexts and failed to repeat their behaviours in alternative contexts such as on weekends or on holiday as they did not identify candidate cues or

contexts for those alternative occasions (Lally et al., 2011). This misunderstanding is consistent with other research that demonstrates that individuals tend to have difficulty in identifying the causes of their habitual behaviours (Mazar & Wood, 2022; Wood et al., 2022), and highlights the value of having insight into individuals' conceptualisations of habit and how they are formed, maintained, and broken.

When asked to nominate the kinds of behaviours that could be formed as habits, participants described a broad array of behaviours. For example, participants identified discrete behaviours (e.g. biting nails) but also more complex repetitive patterns of behaviour that they indicated were synonymous with routines (e.g. a 'morning routine' comprising having a coffee, brushing teeth, and showering). Engagement in these patterns of behaviour are likely governed by both automatic and reflective processes, consistent with dual process perspective on behaviour (Brown et al., 2018; 2020; Deutsch & Strack, 2020; Phipps et al., 2024; Strack & Deutsch, 2004). This is because these sets of behaviours comprise multiple sub-actions with a higher level of complexity (Hagger et al., 2023; McCloskey & Johnson, 2019). For example, an individual might habitually start the shower after they have brushed their teeth, but likely need to have some conscious reflection to ensure the water is at the right temperature and they wash their body and hair thoroughly (Gardner et al., 2016; Phillips, 2020).

Some participants used the word habit to denote personal characteristics relating to their self-identity such as identifying themselves as 'a dog-walker'. Self-identity was identified as an important component of habits references in the SRHI (Verplanken & Orbell, 2003), probably the most widely used self-report measure of habit (Hagger et al., 2023). Verplanken and Orbell (2003) indicated that a key defining characteristic of a behaviour that had been formed as a habit is whether individuals viewed that behaviour as an integral part of the sets of personally-endorsed behaviours that they routinely perform. However, it must be emphasised that the current data is not informative on whether individuals make the distinction between behaviours that they regularly perform, and with which they self-identify, that are and are not under habitual control. The self-identity aspect of the SRHI was designed as a single item that captured this key aspect of habit, and the measure is designed to capture the full essence of the habit construct in conjunction with other items that reflect habit components such as automaticity, lack of awareness and cognition, and context stability. Thus, the current data seem to indicate individuals' awareness of this key aspect of habit, but it would need corroboration by data that also indicated that explicit links were made between this component and the others to enable us to draw a definitive judgment on whether individuals truly make links between multiple components of habit simultaneously and, therefore, have a full, multidimensional perspective on habit.

This research also elicited how lay people characterise habits by, in part, exploring the features of habit. Across both studies, we observed some consistent descriptions of the features of habit. Specifically, lay people characterise habitual behaviours as automatically controlled and performed with high frequency and regularity, two key expert-determined habit characteristics. Specifically, the feature of automaticity was identified through participants describing habits as being outside of conscious awareness and enacted without thought. This is consistent with scientific definitions of habit that define habit as something which is elicited automatically. Further,

participants also identified behavioural frequency or regularity of performance as a key feature of habit. Both frequency; that is, how often the behaviour is performed, and regularity; that is, performance at equal spaced intervals, are both key features of habitual behaviour. Individuals cited both, and may conflate the two. However, this is consistent with the notion that while across individuals' knowledge of habits is collectively consistent with expert conceptualisations and defining features, it is important to note that such representations are likely incomplete and 'patchy', varying from individual to individual, such that individuals exhibit differing 'gaps' in their knowledge of habit defining features. This will likely present problems for interventionists interested in administering interventions aimed at promoting or breaking habits in health contexts. Such interventions may need to fill key knowledge gaps in order to provide a rationale for the intervention that makes clear of the potential mechanisms that are targeted and the potential for the intervention to make meaningful changes. This may have utility in getting the target audience of habit-based interventions 'on board', and sufficiently invested in the intervention approach.

Finally, some participants described habit-related phenomena as emotionally rewarding or comforting. There appeared to be a distinction between participants describing emotional responses as a possible cue for certain habitual behaviours (e.g. 'when anxious I bite my nails'), and an emotional response that is an outcome of performing the habitual behaviour that serves to further reinforce it, although both are effectively emotion-based reinforcing contingencies. Interestingly, participants also indicated habitual behaviours characterised as 'bad' or 'unhealthy' were, in part, difficult to inhibit due to the gratification, comfort, or emotion experienced on its performance. Similarly, however, participants described this as a positive experience for habitual behaviours described as 'good' or 'healthy'. This identification of emotion-related cues indicates another defining feature of habit of which lay individuals are tacitly or explicitly aware. This is consistent with generalised conceptualisations of habit, insofar as rewarding or emotion-related contingencies are reinforcing and are integral to the formation or 'learning' of habits, consistent with learning or reinforcement theories (Wood, 2017). However, it is important to note that despite these contingencies featuring in many definitions of habit, this has generally not been the case for self-report measures of habit such as the SRHI. An item of measure makes reference to feeling 'weird' if the habitual behaviour as not performed, it does not fully capture the emotional component described as a feature of habit by the current sample. As a consequence, beyond indicating that the collective knowledge of habit features is broad and complete, albeit incomplete and highly variable across individuals, the current evidence may signal the need to further develop such measures so as to encompass a fuller breadth of defining features.

These findings suggest that, as a collective, lay participants are able to identify scientifically consistent features of habit. However, this research also highlights that no one participant was able to fully identify the breadth of habit features. This suggests the existence of intra-individual differences in lay beliefs on habit comprising some, but rarely all, features of habit that may lead to inter-individual biases, particularly when responding to items from self-report measures of habits. Current common measures of habit have converging and overlapping components (Hagger et al., 2023), but, similarly exclude content that may be in keeping with theory-influenced

definitions of habit. The interplay between an individual's incomplete representation of habit with a measure that may not effectively capture all aspects of habit may lead to systematic biases in the current literature. To overcome these biases, future research may focus on utilizing measures to identify individuals' lay beliefs on habit. Responses could then be used to account for individual-level biases in subsequent research. Alternatively, participants could be provided a vignette or scenario to prompt reflection on the features of habit before responding to items of a self-report habit measure.

Strengths, limitations, and future directions

Strengths of the current research include the application of received qualitative investigative methods to deliver rich, detailed perspectives on the key research topic; namely, individuals' lay representations of habit as a construct, which allowed for both top-down expert and scientific perspectives on habit to inform the research but also for bottom-up data and, therefore, participant driven perspectives to construct knowledge and inform perspectives on habit. Exploring lay representations on habit may provide insight on the extent to which lay representations are consistent with expert and scientific characterisations of habit. This is important for development of measures and interventions given concerns regarding individuals' capacity to identify the causes of their behaviour. The current investigation is among the first to explore lay representations of habit, and the adoption of two complementary studies provides rich data on individuals' beliefs regarding the features of habit and its effects.

Current findings should be interpreted in light of some notable limitations. First, the current samples were highly homogenous with a majority of participants identifying as female and White, and indicating high educational attainment, which contrasts with general population demographics. Further, participants were primarily recruited through a university. The homogeneity in the demographics characteristics of the current sample preclude broader generalisability of the findings, and current findings should be considered, at best, a signal of lay beliefs on habit that warrant further confirmatory investigation in more diverse samples and those representative of the general population. Second, the current research methods are inherently subjective and reflective, consistent with qualitative methods. As a consequence, the beliefs identified here are directly informed by the perspective and background of those conducting the research. This inherent subjectivity is a feature of these kinds of research, and possible alternative responses and interpretations of the readings of the interview transcripts would be expected. This is an important caveat that should be taken into account when evaluating the current findings, and it should be acknowledged that multiple readings and analyses may yield alternative meanings.

Conclusion

In the current investigation, we conducted two studies aimed at investigating individuals' lay representations of habit as a psychological construct. Consistent with similar approaches focused on identifying individuals lay beliefs and 'think aloud'

approaches to responding to psychometric measures of psychological constructs, the current research is expected to have implications for development of theory on habit, particularly the distinction between lay and expert representations of habit, habit measurement, such as the extent to which individuals' lay representations impact their responses to self-report habit measures, and interventions aimed at promoting or breaking habits, such as how individuals may view the rationale for habit interventions and their perceived effectiveness, both of which may be important for participant 'buy in' to participate in habit interventions. Findings indicated that participants held many beliefs with respect to habit that are largely consistent with scientific conceptualisations (e.g. nominating the types of behaviours that are habitual, identifying key features of habit including the need for frequent performance and cues or specific contexts to prompt the response, and the consistency of the response with self-identity). However, current results also indicated that while collective knowledge converged on expert perspectives, this knowledge was distributed across the participants from the current sample, such that individuals' beliefs may be incomplete or 'patchy' resulting in errors or gaps in knowledge on the defining features and mechanisms of habit. The research also indicated that individuals also identified emotions and rewarding contingencies as key aspects of habit. These components of habit are consistent with some scientific definitions of habit, but have tended not to be explicitly referred to, or at the forefront of, self-report measures of habit. To our knowledge, the studies reported here are among the first to explore lay representations of habit. However, as the current research is exploratory, further confirmatory studies are needed to formally test some of hypotheses that emerge from the key findings, such as the extent to which individuals' lay representations affect their responses to self-report habit measures.

Authors' contributions

Author DJB contributed to the conception, design, data-collection, analysis, and writing of the manuscript; author MSH contributed to the conception, design, writing, and revisions of the manuscript; author KH contributed to the conception, design, analysis, and writing of the manuscript.

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