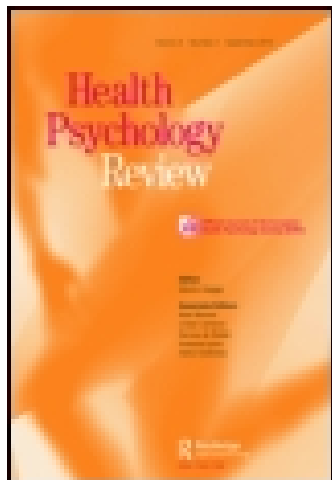


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The Strength of Habit

Sheina Orbell^a & Bas Verplanken^b

^a Department of Psychology, University of Essex, Wivenhoe Park, Colchester, Essex, CO64SQ, UK

^b University of Bath, UK

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Sheina Orbell

University of Essex, UK

and

Bas Verplanken

University of Bath, UK

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Correspondence should be addressed to Sheina Orbell, Department of Psychology, University of Essex, Wivenhoe Park, Colchester, Essex, CO64SQ, UK. sorbell@essex.ac.uk.

The Strength of Habit

Despite its presence in the psychological literature for more than one hundred years the habit concept, the means by which habit serves to control human behaviour in daily life, and the means by which psychologists might promote or change strong habits remain active research topics. Although habit and past behaviour have been acknowledged determinants of human social behaviour in various theoretical models (e.g. Ouellette & Wood, 1998; Triandis, 1977; Bagozzi & Warshaw, 1990), research that might have explored the relative roles of motivational (reflective) and habitual (automatic) processes in human action was hindered by the lack of an adequate measure of habit (Eagly & Chaiken, 1993). Gardner's (2015) engaging discussion of the literature is a welcome reminder of how research in this field has progressed. Psychologists are now somewhat closer to realising empirical evidence to justify James's (1891) recommendation to the young to make habitual, as many useful actions as possible. Habitual behaviours proceed without effortful cognitive mediation and are performed even under conditions of ego-depletion, when self-control and motivational energy are directed elsewhere (Hagger, Wood, Stiff & Chatzisarantis, 2010; Neal, Wood & Drolet, 2013).

Different accounts of habit converge upon three elements: a habit has a history of repetition (e.g. Lally, van Jaarsveld, Potts & Wardle, 2010; Mullan, Allom, Fayn & Johnson, 2014; Aarts, Verplanken & van Knippenberg, 1998; Verplanken & Aarts, 1999), a high degree of automaticity (e.g. Aarts & Dijksterhuis, 2000; Verplanken & Orbell, 2003; Orbell & Verplanken, 2010), and is cued in stable contexts (e.g. Wood & Neal, 2007; Neal, Wood, Labrecque & Lally, 2012; Orbell & Verplanken, 2010). Our contention, however, is that habit should not be equated with the concept of an *impulse* (Gardner, 2015) or with the trait characteristic of *impulsivity* (e.g. Patton, Stanford & Barratt, 1995; Stanford, Mathias,

Dougherty, Lake, Anderson & Patton, 2009, see also Strack & Deutsch, 2004 for an alternative use of the term), which amongst other things may be equated with capriciousness (the antonym of a habitual response). It is true that a habitual response may take many forms: it may be an overt act, or a sequence of acts, a mental response (e.g. Verplanken, Friborg, Wang, Trafimow, & Woolf, 2007), or even an emotional reaction (e.g., Verplanken & Fisher, 2014; Verplanken & Roy, 2013), but a habit does not necessitate an affective component. To define habit as an impulse also risks confusion with related concepts such as *temptation* and *addiction* (Reddish, Jensen & Johnson 2008) that attempt ultimately to trace failures in self-control to pharmacological effects (Neal & Wood, 2008). Certainly, habits may develop in conditions where reward is initially present ('hot'; Wood & Neal, 2007), but they also persist when there is no reward (e.g. eating stale popcorn, not really wanting or liking yet consuming another chocolate or sweet or alcoholic drink or cigarette all the same) and importantly, habits are typically pre-potent; they trump intentions (motives) be they 'hot' or 'cold'. Orbell and Verpanken (2010) showed that detection of smoking cues in a modified Stroop colour-naming task was significantly correlated with SRHI habit strength, but not with measures of smoking dependency or smoking urge. Their study also showed that habit strength predicted non-intentional cigarette lighting action slips in an environment previously associated with smoking. From a practical perspective lack of conceptual clarity may even lead to misdirected attempts at behaviour change (Quinn, Pascoe, Wood & Neal, 2010; van't Riet, Sijtsma, Dagevos & de Bruin, 2011). Impulse may 'appear' to be related to habit as a consequence of the role of impulsivity in failure to exert self control over habit (e.g. Papachristou, Nederkoorn, Havermans, van der Horst & Jansen, 2011) but it is not a part of the stimulus response association that is habit.

The observation that, in certain circumstances, people are able to block or suppress an automatically cued habitual response (Adriaanse et al., 2010; Quinn et al., 2010) does not

constitute a reasonable argument for rejecting the automaticity of the habitual response. A blocked habitual response is simply what it is... a blocked response. There are many automatic processes that can be overridden by a deliberate response (e.g., Devine, 1989). Is the concept of intention invalidated because people may fail to act upon their intentions (Orbell & Sheeran, 1998; Orbell, 2003; Orbell, 2004)? The mental association derived from past stimulus response association is the defining mechanism by which a habit response occurs.

The Self-Report Habit Index

Since its inception, the SRHI (Verplanken & Orbell, 2003) has been employed in more than 300 empirical studies across many contexts. Whilst a great deal of research has concentrated upon diet, exercise and transport behaviours, and largely employed student samples (e.g. Gardner, de Bruin & Lally, 2011), the scale has also facilitated research and intervention in behaviours with fundamental impacts on human health worldwide. For example, the index has been used in an investigation of hand washing with soap in the context of toilet use, food preparation, child feeding and cleaning, that are of central importance to prevention of infant mortality in Kenya (Aunger, Schmidt, Rampura, Coombes, Maina, Matuko & Curtis, 2010), and in Inauen, Tobias and Moiser's (2013) study of water consumption from arsenic free sources (which may be less convenient to collect) in Bangladesh.

Dimensionality

The clear utility of the SRHI may best be understood by considering its content in relation to the definition of habit. While frequent repetition of behaviour in a stable context acts as an available *indicator* of the strong cognitive association between context and behaviour, the SRHI assesses the experience of habit and the underlying cognitive association. The SRHI assesses several different facets of a repetitive response and thus relies

not simply on behavioural frequency, but also assesses the strength of the cognitive association by including items derived from Bargh's (1994) four horsemen of automaticity (lack of awareness and conscious intent, lack of control and mental efficiency). Similarly, Wood, Quinn and Kashy's (2002) signal-contingent diary study showed that people were more likely to label their own actions as habitual if they did not require much thought to perform. The SRHI comprises a number of facets, including repetition and lack of awareness and so on, yet has consistently been shown to be one-dimensional and to possess very high internal reliability, indicating the likelihood that it taps into a single construct. For example if we sought to answer the empirical question "is it a particularly hot day?" a single thermometer measure might be supplemented by additional thermometer measures that, apart from providing a more reliable measure, would obtain redundant information (i.e. a test using the same questions). A higher degree of validity might be obtained if a measure of temperature were combined with other indices such as levels of perspiration, sales of ice cream or numbers of people on the beach. Each of these facets, though very different in nature, together capture the essence of the construct of interest i.e. its defining characteristics.. The twelve SRHI items, including the experience of repetition (e.g. the behaviour is something I do frequently; the behaviour is typical of me) make up a very reliable scale. The item "typical of me" captures the repetitive experience of "something I do"). This is not equivalent to the construct of identity, and was perhaps mislabelled in the original 2003 article. Identity is a separate construct that may sometimes be correlated with habit in predicting behaviour. SRHI Cronbach alphas for the 12 items are usually found to be greater than 0.90 (e.g., Gardner et al., 2011). The SRHI was designed as a short quick to administer scale, but it is possible to reduce the number of items if the need for a shorter scale is strong. The "price" to pay is a somewhat reduced reliability. However, to exclude the

element of repetition is to reduce the scale to a measure of self-reported automaticity. While habit implies automaticity, automaticity does not imply habit.

Automaticity

It may seem counterintuitive to ask people to reflect on automaticity. Indeed, Nisbett and Wilson (1977) raised important questions of the validity of verbal reports on mental processes. People cannot be expected to provide accurate reports of higher order mental processes such as how they arrive at an attribution, solve a multi-attribute choice task, or form a first impression of a person. However, *the SRHI does not ask people to engage in such tasks*. Reporting on automaticity is not the same as asking an individual to provide insight into how an automatic process works. It is a self-report measure, and is thus subject to the limitations shared with all self-report measures. However, we contend that people are able to provide valid information on their habits using the items of the SRHI. For example, it is not unreasonable to expect an individual with a strong habit to make valid reports about whether something is experienced as weird if it is not done, or difficult to avoid doing, and it is entirely reasonable that an individual who does not have a habit will reject these experiences and respond in the negative.

Cues, Context and Frequency

From a practical point of view is it likely that a respondent to the SRHI might report a strong habit as infrequent (a repetition item in the SRHI) because the context in which it occurs is encountered infrequently? Clearly the internal consistency of the scale across many studies speaks against this likelihood. An example of an infrequent act that might nonetheless be a habit is taking an annual skiing holiday (at least for a person living in a snowless country). Such an individual who takes a skiing holiday every year is very likely to report that he or she takes a skiing holiday frequently, while a person who never takes a skiing holiday or has done so only once or twice is unlikely to report that he or she does so

frequently. However, the respondent may be even more likely to do so if the stem used to operationalize the SRHI specifies the behaviour in question as ‘taking a ski holiday every year is something I do...’. Such a holiday is likely to be cued by such things as month of the year, or prompts from usual holiday companions, and may be disrupted by the lack of availability of such companions, for example.

Many early studies employing the SRHI were formulated in the context of the theory of planned behaviour (Ajzen, 1991) and the possible dual influences of intention and habit upon future behaviour so that the action, context and timeframe for action was specified as required by that theory (cf. Trafimow, 2014; Head & Noar, 2014). Clear and specific operationalization of the *action* comprising the habit response will be important in any SRHI study (cf. Gardner & Tang, 2014). It is timely to consider the question of how and when context and cues should be specified in the stem when administering the SRHI. The SRHI has been constructed to be a generic instrument. All references to specific contexts, which include the specification of habit cues, can easily be accommodated in the instruction or the ‘stem’ of the measure and with reference to the specific research question. This makes the SRHI a flexible instrument. A behaviour that is only performed in one context, such as wearing a seatbelt, may be reliably assessed without reference to that context. However, if one wanted to know the strength of habit to wear a seatbelt when in the backseat of a car (as opposed to the front seat) it may be important to specify “wearing a seatbelt (behaviour X) when seated in the back seat of a car (context Y) is something I do....”. A habit that occurs in many contexts or in response to many different cues may be investigated by constraining the stem to a particular context or cue or by multiple administrations. In one study comparing the use of a single ‘generalized’ SRHI with the mean habit strength derived from multiple administrations of the index (one for each cue) (Orbell & Verplanken, 2010, footnote 1) the generalized index performed almost as well as the specific index in predicting cue detection.

The multiplication of a behaviour (e.g. “I jog” never-everyday) X context stability (e.g. “I do this” always in the same place-never in the same place) advocated by the BFCS (Neal, Wood, Labrecque & Lally, 2012) will produce a score indicative of a strong habit only when frequent jogging occurs in the same place. A person who jogs every day but varies his or her context for jogging will be assumed to possess a moderate but equivalent habit to a person who jogs occasionally but always in the same place. This difficulty may be overcome by the use of the SRHI and the specification of a particular context in the stem (e.g. “Jogging in the forest is something I do....”). The SRHI can thus be utilized to investigate the initiation and development of habit (Lally & Gardner, 2013), the strength of existing habits and the effect of interventions, and to compare habit across contexts.

The distinction between context and cue is also important to consider. People may not be aware of the specific cues to their habits that occur in a particular context so it may often be preferable to specify a context (Orbell & Verplanken, Study 2). Also, people may misattribute their habits. For example, an individual may *believe* that he or she eats chocolate, or smokes, or even jogs, to relieve (in response to) feelings of stress. However, he or she may equally be reporting upon a *habit fact* (albeit without conscious awareness of the fact); stressful circumstances may in fact give rise to increased habitual responding in *usual* contexts (more jogging, smoking or chocolate eating) because they are ego-depleting (Hagger et al, 2010), a circumstance in which efforts to control habitual responding are likely to fail. If ‘stress’ were employed as a cue or context in the stem to the SRHI in this example the data might provide valuable information about habitual responding in conditions of self-control failure but it may not provide a good indication of habit strength per se. The actual cue to action is more likely to be located within a context such as ‘when watching television’ or ‘in the evening as soon as I return from work’ or ‘during my morning coffee break’ that has been repeatedly paired with the behaviour in the past. The use of monitoring or tracking diary

studies rather than reliance upon free recall of circumstances in the preliminary stages of research will help to identify cues and contexts where behaviour occurs so that they can be operationalized in subsequent studies.

Employment of implicit approaches to the assessment or cross validation of habit will not avoid the difficulty of identifying habit cues. Pilot work will need to be conducted with similar or even the same samples to establish the cues that are likely to be detected rapidly as a consequence of habit strength (e.g. Orbell & Verplanken, 2010) or prime responses that are a consequence of habit strength (e.g. Neal, Wood, Labrecqu & Lally, 2012). Measures that merely tap automaticity without reference to the stimulus response associations characterized by repeated responding in the past cannot be said to be useful measures of habit (e.g. IAT) but they may detect other processes that also contribute to behaviour explanation by other processes such as affective and motivational forces, or familiarity.

Conclusion

In 1993 Eagly and Chaiken wrote “(...) the role of habit per se remains indeterminate (...) because of the difficulty of designing adequate measures of habit” (p.181). Since the introduction of the SRHI, the subsequent development of other habit measures by others, as well as theorising about the measurement of habit, we are now in a much better place than we were two decades ago, and, hopefully, in a good position to further pursue and extend habit research and theory.

References

- Aarts, H., Verplanken, B., & van Knippenberg, A. (1998). Predicting behavior from actions in the past: repeated decision-making or a matter of habit? *Journal of Applied Social Psychology, 28*, 1355–1374.
- Aarts, H. and Dijksterhuis, A. (2000). Habits as knowledge structures: Automaticity in goal-directed behavior. *Journal of Personality and Social Psychology, 78*, 53-63.
- Adiaanse, M., Oettingen, B., Gollwitzer, P., Hennes, E., de Ridder, D. and de Wit, J., (2010). When planning is not enough: Fighting unhealthy snacking habits by mental contrasting with implementation intentions (MCII). *European Journal of Social Psychology, 40*, 1277-1293.
- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes, 50*, 179-211.
- Aunger, R., Schmidt, W. P., Ranpura, A., Coombes, Y., Maina, P. M., Matiko, C. N., & Curtis, V. (2010). Three kinds of psychological determinants for hand-washing behaviour in Kenya. *Social Science & Medicine, 70*(3), 383-391.
- Bagozzi, R. P., & Warshaw, P. R. (1990). Trying to consume. *Journal of Consumer Research, 17*, 127-140.
- Bargh, J. A. (1994). The four horsemen of automaticity: awareness, intention, efficiency, and control in social cognition. In: R. S. Wyer & T. K. Srull (Eds.), *Handbook of Social Cognition, vol. 1* (pp.1–40). Hillsdale, NJ: Erlbaum.
- Devine, P.G. (1989). Stereotypes and prejudice: Their automatic and controlled components. *Journal of Personality and Social Psychology, 56*, 5-18.
- Eagly, A.H., & Chaiken, S. (1993). *The psychology of attitudes*. Fort Worth: Harcourt Brace Jovanovich College Publishers.

- Gardner, B. (2015) A review and analysis of the use of 'habit' in understanding, predicting and influencing health-related behavior. *Health Psychology Review*. Advance online publication. doi: 10.1080/17437199.2013.876238
- Gardner, B., de Bruin, G.J., and Lally, P. (2011). A systematic review and meta-analysis of applications of the self-report habit index to nutrition and physical activity behaviours. *Annals of Behavioral Medicine*, 42, 174-187. Doi: 10.1007/s12160-011-9282-0.
- Hagger, M., Wood, W., Stiff, C., and Chatzisarantis, N. (2010). Ego-depletion and the strength model of self-control: A meta-analysis. *Psychological Bulletin*, 136, 496-525.
- Head, K. J., & Noar, S. M. (2014). Facilitating progress in health behaviour theory development and modification: the reasoned action approach as a case study. *Health Psychology Review*, 8(1), 34-52. doi: 10.1080/17437199.2013.778165
- Inauen, J., Tobias, R., & Molser, H. J. (2013). Predicting water consumption habits for seven arsenic-safe water options in Bangladesh. *BMC public health*, 13(1), 417.
- Lally, P., & Gardner, B. (2013). Promoting habit formation. *Health Psychology Review*, 7, S137-S158. doi: 10.1080/17437199.2011.603640
- Lally, P., van Jaarsfeld, C.H.M., Potts, H.W.W., and Wardle, J. (2010). How habits re formed: Modelling habit formation in the real world. *European Journal of Social Psychology*, 40, 998-1009. doi: 10.1002/ejsp.674.
- Mullan, B., Allom, V., Fayn, K., & Johnson, I. (2014). Building habit strength: An intervention designed to improve food-safety behavior. *Food Research International*, 66, 274-278.
- Neal, D. and Wood, W. (2008). Linking addictions to everyday habits and plans. *Behavioral and Brain Sciences*, 31, 455.
- Neal, D.T., Wood, W., and Drolet, A. (2013). How do people adhere to goals when willpower is low? The profits (and pitfalls) of strong habits. *Journal of Personality and Social Psychology*, 104, 959-975.
- Neal, D., Wood, W., Labrecque, J., and Lally, P. (2012). How do habits guide behavior? Perceived and actual triggers of habits in daily life. *Journal of Experimental Social Psychology*, 48, 492-498.

Nisbett, R. A., & Wilson, T. D. (1977). Telling more than we can know: Verbal reports on mental processes. *Psychological Review*, 84, 231-259.

Ouellette, J. A., & Wood, W. (1998). Habit and intention in everyday life: The multiple processes by which past behavior predicts future behavior, *Psychological Bulletin*, 124, 54–74.

Orbell, S. (2004). *Intention-behaviour relations: A self-regulation perspective*. In Haddock, G., & Maio, G. R. O. (Eds.). *Contemporary perspectives on the psychology of attitudes*. London: Psychology Press.

Orbell, S. (2003). Personality systems interactions theory and the theory of planned behavior: Evidence that self-regulatory volitional components enhance enactment of studying behavior. *British Journal of Social Psychology*, 42, 95-112.

Orbell, S. and Sheeran, P. (1998) 'Inclined abstainers': A problem for predicting health behaviour. *British Journal of Social Psychology* 37, 151-166.

Orbell, S. & Verplanken, B. (2010). The automatic component of habit in health behavior: Habit as cue-contingent automaticity. *Health Psychology*, 29, 374-383.

Patton JM, Stanford MS, Barratt ES. Factor Structure of the Barratt Impulsiveness Scale. *Journal of Clinical Psychology*. 1995;51:768–774.

Papachristou, H., Nederkoorn, C., Havermans, R., van der Horst, M., Jansen, A. (2012). Can't stop the craving: the effect of impulsivity on cue-elicited craving for alcohol in heavy and light social drinkers. *Psychopharmacology*, 219 (2), 511-518. doi: 10.1007/s00213-011-2240-5. Epub 2011 Mar 8.

Quinn, J., Pascoe, A., Wood, W., and Neal, D. (2010). Can't control yourself? Monitor those bad habits. *Personality and Social Psychology Bulletin*, 36, 499-511.

Reid, A., Jensen, S., and Johnson, A. (2008). A unified framework for addiction: Vulnerabilities in the decision process. *Behavioral and Brain Sciences*, 31, 415-487.

Stanford M, Mathias C, Dougherty D, Lake S, Anderson N, Patton J. Fifty years of the Barratt Impulsiveness Scale: An update and review. *Personality and Individual Differences*. 2009;47:385–395.

Strack, F. and Deutsch, R. (2004). Reflective and impulsive determinants of social behavior. *Personality and Social Psychology Review*, 8, 220-247.

Trafimow, D. (2014). On retiring the TRA/TPB without retiring the lessons learned: a commentary on Sniehotta, Pesseau and Araujo-Soares. *Health Psychology Review*. doi: 10.1080/17437199.2014.884932.

Triandis, H.(1977). *Interpersonal Behavior*. Monterey, CA: Brooks-Cole.

van't Riet, J., Sijtsema, S., Dagevos, H., De Bruin, G. (2011) The importance of habits in eating behavior: An overview and recommendations for future research. *Appetite*, 57, 585-596. Verplanken, B., & Aarts, H. (1999). Habit, attitude, and planned behaviour: Is habit an empty construct or an interesting case of automaticity? *European Review of Social Psychology*, 10, 101-134.

Verplanken, B., Friberg, O., Wang, C. E., Trafimow, D., & Woolf, K. (2007). Mental habits: Metacognitive reflection on negative self-thinking. *Journal of Personality and Social Psychology*, 92, 526-541.

Verplanken, B. and Orbell, S. (2003). Reflections on past behavior: A self-report index of habit strength. *Journal of Applied Social Psychology*, 33, 1313-1330.

Verplanken, B., & Fisher, N. (2014). Habitual worrying and benefits of mindfulness. *Mindfulness*, 5, 566-573, DOI: 10.1007/s12671-013-0211-0.

Verplanken, B., & Roy, D. (2013). "My worries are rational, climate change is not": Habitual ecological worrying is an adaptive response. *PLoS ONE*, e74708, doi:10.1371/journal.pone.

Verplanken, B., & Sato, A. (2011). The psychology of impulse buying: An integrative self-regulation approach. *Journal of Consumer Policy*, 34, 197–210.

Wood, W., and Neal, D. (2007). A new look at habits and the habit-goal interface. *Psychological Review*, 114, 843-863.

Wood, W., Quinn, J., and Kashy, D. (2002). Habits in everyday life. Thought, emotion, and action. *Journal of Personality and Social Psychology*, 83, 1281-1297.