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COMMENTARY

The theory of planned behaviour is alive and well, and not ready to retire: a commentary on Sniehotta, Presseau, and Araújo-Soares

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In their call to lay the theory of planned behaviour (TPB) to rest, Sniehotta, Presseau, and Araújo-Soares (2014) contend that the theory has been thoroughly discredited, at least as a guide to predicting and changing health-related behaviour. Some of their arguments are misguided, resting on a poor understanding of the TPB and of the nature of psychological research, while others are illogical or patently wrong. Take, as an example of the latter, the assertion that the theory is static in nature, not taking into account the effects of behaviour on cognitions and future behaviour. This misconception may occur when a diagram of the TPB is inspected without reading the accompanying text. The usual graphic representation of the theory is an oversimplification which, among other things, omits feedback loops from behaviour to cognitions. That we did not disregard such feedback loops can be seen in the following statement:

> When a behavior is carried out, it can result in unanticipated positive or negative consequences, it can elicit favorable or unfavorable reactions from others, and it can reveal unanticipated difficulties or facilitating factors. This feedback is likely to change the person's behavioral, normative, and control beliefs and thus affect future intentions and actions. (Fishbein & Ajzen, 2010, p. 218)

Indeed, in an early representation of the theory of reasoned action (Fishbein & Ajzen, 1975, p. 16), the feedback loops are explicitly shown in the diagram. Sniehotta et al. acknowledge that the TPB has been shown to afford consistent prediction of behaviour from intention and perceived behavioural control and that a large change in intentions is found to also produce changes in behaviour. If that is the case, one wonders in what sense the theory has been discredited. In any event, Sniehotta et al. qualify their favourable observation by the assertion that the theory's common-sense propositions are not open to empirical falsification. However, in an inherent contradiction, their editorial is fundamentally a claim that the theory has indeed been falsified.

Sniehotta et al. point to the ostensibly limited predictive validity of the TPB as another, though secondary problem. Here they fail to realise that the theory is expected to afford good prediction of intentions from attitudes, subjective norms and perceived

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behavioural control – which is indeed confirmed in most applications; but that the prediction of behaviour from intentions is fraught with potential problems (for a detailed discussion, see Fishbein & Ajzen, 2010, pp. 53–63). Events occurring between assessment of intentions and observation of behaviour can produce changes in intentions and unanticipated obstacles can prevent people from carrying out their intentions. What is more, the beliefs that are accessible in the real situation in which a behaviour is performed can differ from the beliefs that are accessible in the hypothetical situation in which the TPB constructs are typically assessed (Ajzen, 2012; Ajzen & Sexton, 1999). Interestingly, this could account for failure to act on previously expressed intentions if, for example, favourable beliefs about exercising after work are readily accessible in the morning, but unfavourable beliefs are accessible after a long day's work.

It is true, however, that the theory also does not fully account for the variance in intentions. This can in part be attributed to the fact that measures of the theory's constructs are fallible both with respect to reliability and with respect to construct validity. Even when the measures are carefully constructed, reliabilities rarely exceed .80, suggesting that predictive validity for intentions may be getting close to the theoretical limit. This problem can be alleviated by correcting for attenuation due to unreliability, as is sometimes done in meta-analytic syntheses of TPB research and as occurs routinely in structural equation modelling. In contrast, the problem of imperfect validity is not so easily solved. In a typical application of the TPB, a small number of items, perhaps three or four, is used to directly assess each of the major TPB constructs. Because such a small number of items is usually incapable of completely capturing the underlying construct, the measure's validity is impaired. This state of affairs can not only help to account for imperfect predictive validity, but it can also help to explain the frequent finding that adding more variables to the model can improve prediction of intentions. Findings of this kind are usually interpreted as undermining the theory's sufficiency assumption and they have led Sniehotta et al. to another critique, namely that 'some of the theory's propositions are patently false' (p. 3).

Now, there is nothing in the TPB to preclude addition of new predictors. Indeed, the TPB was developed by adding perceived behavioural control to the original theory of reasoned action. Some of these additions are well justified and make intuitive sense, but other are more questionable (see Head & Noar, 2014, for a general discussion). Note first that even simply adding a second, different measure of one of the theory's constructs, say attitude, can improve prediction of intention because the second measure can contain meaningful variance in attitudes not accounted for by the (incomplete) original measure. Consistent with this argument, it has been shown that including a measure of attitudes towards not performing a behaviour, in addition to attitudes towards performing the behaviour, can significantly improve prediction of intentions (Ajzen & Sheikh, 2013; Gardner & Abraham, 2010). The Ajzen and Sheikh study also served to explain the frequent finding that addition of anticipated affect can greatly improve prediction of intentions (see Sandberg & Conner, 2008). In virtually all studies that have shown this effect, attitude was assessed in relation to performing a given behaviour (e.g., exercising) whereas anticipated affect (guilt, regret, etc.) was assessed in relation to not performing the behaviour (e.g., not exercising). The improved predictive validity was shown to be due to this difference in behavioural focus and it had nothing to do with affect as such. Indeed, when a measure of attitude towards not performing the behaviour was included in the prediction equation, adding anticipated affect no longer accounted for unique variance. The imperfection of our measures may also be responsible for the failure of

the TPB's constructs to completely mediate the effects of other variables on intentions and behaviour. A detailed discussion of challenges to the theory's sufficiency assumption can be found in Fishbein and Ajzen (2010, pp. 281–300).

Some of Sniehotta et al.'s denunciations rely on citing the criticisms of other investigators without discussing the merits of their arguments. For example, Sniehotta et al. approvingly cite others who fault the TPB 'for its exclusive focus on rational reasoning, excluding unconscious influences on behaviour' (p. 2). Nothing could be further from the truth. As I have repeatedly emphasised (e.g., Ajzen, 2004, 2008, p. 2804, 2011a, see also Ajzen, 2011b, 2012; Ajzen & Fishbein, 2000, 2005), the TPB does *not* propose that people are rational or that they behave in a rational manner. To be sure, more often than not, our beliefs correspond reasonably well to reality (Jussim, 2012). This could hardly be otherwise for if they did not, we would not have survived as a species. However, the TPB makes no assumptions about the objectivity or veridicality of behavioural, normative and control beliefs. These beliefs may rely on invalid or selective information; they may be irrational, reflecting unconscious biases, paranoid tendencies, wishful thinking or other self-serving motives; and they may fail to correspond to reality in many other ways. All the theory stipulates is that people's attitudes, subjective norms and perceptions of control follow reasonably and consistently from their beliefs, no matter how the beliefs were formed, and that in this way they influence intentions and behaviour. Authors who continue to perpetuate the gross misrepresentation that the TPB is a model of rational behaviour must never have read any of my recent conceptual articles, chapters or books dealing with the theory.

Sniehotta et al. reserve their most severe criticism of the TPB for its ostensible failure to provide an adequate basis for behaviour change interventions. They argue that the TPB fails to specify how cognitions change, making it difficult to devise effective interventions to modify attitudes, subjective norms and perceptions of behavioural control; and that where empirical tests of behaviour change interventions have been tried, observations have not been in line with the theory.

Regarding the first point, note that the TPB is in fact not a theory of behaviour change. Instead, it is meant to help explain and predict people's intentions and behaviour. Nevertheless, the theory can serve as a useful framework for designing effective behaviour change interventions (Ajzen, 2011a). To begin with, it draws a distinction between motivating people who are not inclined to perform a behaviour of interest versus enabling people who already have positive intentions to act on those intentions. With respect to the former, the theory and its attendant methodology can help us identify the beliefs that have to be modified in order to produce change in intentions, even if it does not and was not meant to provide guidance on the means, strategies or techniques that can effectively produce changes in these beliefs (see Ajzen, 2011a; Fishbein & Ajzen, 2010, pp. 336–352). The theory suggests that to the extent that we are successful in changing accessible behavioural, normative and control beliefs we should observe corresponding changes in attitudes, subjective norms and perceptions of control; and that these changes in the theory's predictors should influence intentions. In the case of existing favourable intentions, or favourable intentions produced by an intervention, the intentions are likely to be enacted to the extent that the behaviour is under volitional control (and subject to the other contingencies discussed earlier). Generally speaking, because of the imperfect correlations among the theory's constructs, large changes in beliefs will tend to produce smaller changes in attitudes, subjective norms, and perceptions of control; even less change in intentions; and least in actual behaviour. For an intervention to have an

appreciable effect on intentions, therefore, it has to produce large changes in beliefs; and for the intention to lead to the desired behaviour, people must have the requisite resources and potential barriers to behavioural performance must be removed.

Now to Sniehotta et al.'s second point that the results of interventions based on the TPB have shown it to be unsuitable as a theory of behaviour change. We should immediately acknowledge that changing intentions and behaviour is not an easy task. To design an effective behaviour change intervention requires a great deal of preparation and formative research. When the TPB is used as the conceptual framework for designing an intervention, it is first necessary to establish whether the problem is one of insufficient motivation or of a failure to carry out existing favourable intentions. An intervention designed to create more favourable intentions requires pilot work that involves (i) eliciting readily accessible behavioural, normative and control beliefs in a representative sample of the target population, (ii) selecting specific existing accessible beliefs or, often better, novel beliefs not emitted in the elicitation stage to target in the intervention, (iii) designing an intervention (e.g., persuasive message, group discussion, modelling, etc.) that attacks the selected beliefs, (iv) making sure that the intervention produces large changes in the targeted beliefs and that it does not have countervailing impact effects on unmentioned beliefs and (v) demonstrating that the intervention had an appreciable impact on the aggregates of behavioural, normative, and/or control beliefs such that the post-intervention aggregates of readily accessible beliefs are significantly more favourable towards performance of the desired behaviour than were the preintervention aggregates. In addition, (vi) investigators must also use the formative research to develop measures of attitude, subjective norm, perceived behavioural control, intention and behaviour that have satisfactory psychometric properties, including sufficient variance as well as reliability and discriminant validity.

A second very different type of intervention is needed if it is established that many people have positive intentions but fail to act on them. In this case, investigators must (i) try to make sure that the beliefs accessible in the behavioural context do not differ substantially from the accessible beliefs that were identified in the elicitation phase; (ii) that participants have the means, skills and other resources to perform the behaviour of interest; (iii) that all potential barriers to its performance have been removed; and (iv) that no unanticipated events or new information have led to revised intentions after the intervention has taken place. Only when all of the above preconditions are met can we confidently expect that changes in beliefs will result in more favourable attitudes, subjective norms and/or perceptions of control; that these changes will be reflected in intentions; and that people will be likely to act on their favourable intentions.

Unfortunately, few investigators expend sufficient effort in formative research to ensure an effective TPB-based intervention. Instead, they often take a rather cavalier approach, relying on intuition without much attention to the issues outlined above. A good case in point is the intervention study reported by Sniehotta (2009) which was designed to increase college students' attendance at university sports facilities. Apparently, the only formative research conducted was to elicit accessible beliefs in a pilot study. Had measures of the TPB components been obtained in pilot research, it would have become apparent that the problem in this population was not primarily a lack of motivation: even without any intervention, attitudes, subjective norms and intentions with respect to participating in the university's sports and recreation programme were generally favourable. Although an intervention to further strengthen motivation could have been of some value, the major emphasis should have been placed on making sure

that participants were able to carry out their intentions. Indeed, of the TPB variables, perceived behavioural control, although positive, had the lowest value.

Even disregarding this issue, the intervention study left much to be desired. First, although the investigator used a previously validated questionnaire to assess the TPB constructs, no evidence was provided for the reliability and discriminant validity of the measures in the present context. More importantly, no attempt was made to ensure that the interventions actually changed the beliefs at which they were directed (see the related discussion by Michie & West, 2013). In fact, these beliefs were never assessed. The interventions seem to have been devised intuitively without any pilot testing. Casual inspection raises doubts regarding the likely effectiveness of the behavioural belief intervention which emphasised 'the positive effects of regular physical activity on health, fitness, mood, stress and ability' (p. 261). Not only do these beliefs deal with regular physical activity in general and not with the specific goal of getting students to participate in the university's sports and recreation programme, but it is also very likely that most students were already familiar with these benefits of regular exercise. Being exposed to the information contained in the intervention was therefore unlikely to produce much change in beliefs or attitudes. A better intervention designed to change the attitudes would have emphasised positive outcomes of participating in the university's programme and/or negative outcomes of not participating that were not part of already existing beliefs supporting the behaviour.

Given the offhand way in which the interventions were designed, it is hardly surprising that the results were disappointing and difficult to interpret. The interventions had only very small, albeit statistically significant effects on attitudes, subjective norms and perceptions of behavioural control; perceived behavioural control was unexpectedly influenced by the normative belief intervention but not by the control belief intervention; the small change in intentions was due solely to the normative belief intervention while the behavioural and control belief interventions had no significant effects on intentions; and the intention–behaviour relation was weak. In light of the study's many deficiencies, its disappointing findings should not have come as a surprise. Yet, manifesting his unfamiliarity with what is needed to provide an adequate test of the TPB in the context of a behaviour change intervention, Sniehotta concluded that his predictably negative findings provide an evidence to discredit the theory.

In their editorial, Sniehotta et al. (2014) point to the review by Hardeman et al. (2002) as showing lack of support for the effectiveness of behaviour change interventions based on the TPB. However, this review does not provide a good basis for drawing such a conclusion. A detailed discussion of the research reviewed by Hardeman et al. can be found in Fishbein and Ajzen (2010, pp. 369–371). To summarise briefly, of the 24 studies reviewed, 4 did not involve any intervention and hence are irrelevant for the issue at hand. Two other studies did include an intervention component, but the intervention was not based on the TPB. Other investigations used the TPB to evaluate the effects of an intervention, but the intervention itself was not guided by this theoretical framework. Finally, of the six studies that actually used the TPB to design and evaluate the effects of an intervention, two failed to maintain compatibility among its measures, an essential prerequisite in applications of the TPB. Indeed, Hardeman et al. cautioned readers not to draw strong inferences on the basis of the small number of studies that 'were often of poor design' (p. 149). However, when we consider only the four studies that reported interventions conforming to requirements of the TPB (Brubaker & Fowler, 1990; Jemmott, Jemmott, & Fong, 1998; Murphy & Brubaker, 1990; Sanderson & Jemmott,

1996), the results were quite encouraging. These interventions reported strong effects on the targeted theoretical components and on actual behaviour. Similarly, good support for the theory has been reported in other studies that were not included in Hardeman et al.'s review (see Rutter & Quine, 2002).

Sniehotta et al. propose to retire the TPB and replace it with a broader theoretical approach. While they offer no framework of their own, they do list a number of models and lines of research that, in their opinion, provide viable alternatives to the TPB. Of course, we should welcome other approaches if they are shown to be superior to the TPB or if they can augment the TPB's reasoned action approach. However, Sniehotta et al. offer no evidence that the models they listed can respond to any of the criticisms they level at the TPB. Do these models account for more variance in behaviour? Are they sufficient in the sense that other possible predictors do not account for additional variance in behaviour? Is there any evidence that interventions based on these models produce more behaviour change than (properly designed) interventions based on the TPB? Without evidence of this kind, listing possible replacements for the TPB amounts to little more than hand waving.

In conclusion, Sniehotta et al. have failed to make a case for retiring the TPB. They display a profound misunderstanding of the theory itself, they fail to appreciate the work needed to properly apply the theory in efforts to change behaviour and they misinterpret negative findings of poorly conducted studies as evidence against the theory. Contrary to their claims, the TPB is alive and well and gainfully employed in the pursuit of a better understanding of human behaviour.

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