



## Building better boxes for theories of health behavior: a comment on Williams and Rhodes (2016)

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COMMENTARY

## Building better boxes for theories of health behavior: a comment on Williams and Rhodes (2016)

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Health psychology has a long history of dusting off the boxes drawn to represent variables in theories of health behaviour. Researchers have rearranged the boxes (e.g., protection motivation theory), added a few new boxes (e.g., the prototype willingness model), explored the space between the boxes (e.g., the intention-behaviour gap), and gotten really fussy about measuring the boxes (e.g., theory of planned behaviour). My commentary focuses on this last issue, building better boxes.

### Fixing survey item wording

Various measurement problems and associated errors may add up to being a bigger impediment to testing theories of health behaviour than previously appreciated. [Table 1](#) summarises some potential and demonstrated problems. First, with respect to self-efficacy, Williams and Rhodes (2016) identified a serious problem with measures confounding motivation/intention to engage in health behaviours and self-efficacy. One of several necessary and practical actions they offered is to add 'if I wanted to' to self-efficacy items, until researchers find a better solution.

Second, low-quality risk perception questions are a widespread problem. Some dozen years ago, my then graduate advisor Neil Weinstein and I offered a list of criteria that risk perception measures should address: (1) be about the person, (2) name a health consequence, (3) specify a time frame, and (4) specify whether the person does or does not engage in the health behaviour (Brewer, Weinstein, Cuite, & Herrington, 2004). Implicit but not stated was that measures should assess one and only one risk perception construct at a time. This advice came out of our concern that studies were underestimating the true association of risk perceptions and behaviour. Our later meta-analysis found that higher quality risk perception measures had higher correlations with health behaviour (vaccination) (Brewer et al., 2007). In the years in between, I have had a hard time convincing several collaborators and trainees that our criteria matter.

Third, low-quality anticipated regret questions are also widespread. Recently, two of my post-docs, Jessica DeFrank and Melissa Gilkey, and I offered advice on how to measure anticipated regret (Brewer, DeFrank, & Gilkey, in press). Measures of anticipated regret should (1) specify a negative consequence of the action or inaction; (2) assess regret of the action or inaction but not the health consequence; (3) examine only anticipated regret without also assessing other expected negative emotions; and (4) have separate subscales for action and inaction. The meta-analysis found that higher quality measures, for example, that assessed anticipated regret of inaction undiluted by other anticipated affects (like anger or fear), showed a stronger association with health behaviours.

Fourth, what if perceived barriers are routinely confounded with motivation/intention? In my own work, colleagues and I have used some sub-par homemade measures that we later regretted. One of

**Table 1.** Problems with wording of survey items assessing constructs in theories of health behaviour.

Construct	Problem	Proposed wording suggestions
Self-efficacy	Confounded with motivation/intention	Specify 'if I wanted to' or similar
Perceived risk	Imprecise measurement	Specify (1) Person (2) Health consequence (3) Time frame (4) Whether or not the person engages in the health behaviour
Anticipated regret	Imprecise measurement	Specify (1) Health consequence (2) Regret due to action or inaction but not due to the health consequence (3) Anticipated regret but not other expected negative emotions (4) Action and inaction in separate subscales
Perceived barriers	Confounded with intentions/motivation	Assess difficulty of addressing the barrier, without assessing inclination to engage in the target health behaviour.
Intentions	Confounded with perceived barriers	Specify level of key barrier (e.g., 'if it were free')

Note: Perceived risk includes perceived likelihood, perceived severity, and perceived susceptibility.

my studies assessed perceived barriers by asking, 'How much would the following things discourage or encourage you to get your adolescent daughter vaccinated against HPV?' followed by facilitators and barriers such as vaccine side effects (Fazekas, Brewer, & Smith, 2008). In retrospect, the item clearly confounded perceived barriers with motivation/intentions.

Fifth, what if the confounding goes the other way as well, with motivation/intention measures being confounded by barriers to action. Our national study of US parents found that 47% were willing to get HPV vaccine for their adolescent sons if it were free, but only 11% of parents were willing to vaccinate if the three dose series cost \$400 (Reiter, McRee, Gottlieb, & Brewer, 2010). The finding suggests that motivation/intentions measures with insufficient details on barriers may inadvertently overstate the level of interest by omitting key facts about the future world respondents will face. The problem may seem obvious, yet very few motivation/intentions measures specify potential barriers. Clarifying barriers may be one way to follow Fishbein and Ajzen's (2010) recommendation that motivation/intentions measures correspond closely to the target behaviours.

### Other fixes

Measurement errors are common and are not new or unique to behavioural science. Labs around the world studying cancer have had their samples contaminated by the immortal cervical cancer cells of Henrietta Lacks (Skloot, 2010). More recently, meta-analyses have summarised the association of HPV infection with lung cancer and breast cancer, two associations that are almost certainly bogus, caused by cross-contamination of samples within the labs (Koshiol et al., 2011).

My reasons for trotting out my two lists of criteria for measuring risk appraisals were a combination of dismay (health psychologists use a lot of terrible measures), optimism (lists are good, right?), and cynicism (if nothing else, maybe the lists will bully someone somewhere). The same mixed feelings followed me as I read the introduction to Williams and Rhodes' article (2016) which observes that most measures confound self-efficacy with motivation/intentions. It is worth pausing for a moment to note how *old* the basic observation is (Borkovec, 1978; Kazdin, 1978; Wolpe, 1978). At almost 40 years old, the idea is older than the discovery of AIDS, personal computers, or the Kardashian sisters. It started in some form well before dinosaurs roamed the earth in Jurassic Park, which surprised me as I first heard of the self-efficacy confound only last summer.

If the problem of measurement errors is longstanding and widespread, the question that next comes up is what a solution might look like beyond good advice on wording. Williams and Rhodes (2016) have offered several practical solutions to the problems with the self-efficacy measures: (1) reconceptualize most previous self-efficacy research as having addressed a type of motivation, (2) use the term perceived capability for the new untainted measure, and (3) study the messy space in between perceived capability and can-do motivation. These all sound right, but forgive me for being sceptical that this will have much impact.

In the spirit of optimism, let me offer a few other possible fixes. To start, the field needs to adopt a prescriptive solution. Researchers need agree on the basics of reasonable 'ought-to' approaches to item wording for the various constructs in theories of health behaviour. Table 1 offers an ad hoc collection of such advice, focused on Williams and Rhodes' and my own work. Synchronisation is always painful, but creating four decades of research using off-target self-efficacy measures has not been a better alternative.

Next, someone needs to better disseminate this prescriptive advice. Articles like Williams and Rhodes' are a good start, but if the field really is 40 years in to this error, it needs other fixes. The US National Cancer Institute tried to add capacity in this area with Grid Enabled Measurement. The descriptive approach they took allowed pretty much anything to get included, which makes the site a mix of high- and low-quality materials with respect to conceptual clarity. However, I vote for a more prescriptive, opinionated approach that calls out examples of good and bad measurement, offering guidelines or at the very least caveats about the consequences of different approaches. I am especially hopeful about shaping the practices of new scientists during their training. Graduate training could take the measurement of these constructs more seriously. Most training programmes touch on measurement, but this issue of wording problems is absent in many training programmes. Key texts on health behaviour theories, including my own contributed chapters, also largely miss this topic (Glanz, Rimer, & Viswanath, 2015). Charity begins at home, and the field is in need of a large charitable effort to build better boxes to test theories of health behaviour.

### Disclosure statement

No potential conflict of interest was reported by the author.

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