

Social marketing theory measurement precision: a theory of planned behaviour illustration

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Abstract

Purpose – In response to calls for theory use and a more reflexive turn in social marketing, this paper aims to draw on previously executed studies. In line with dominant social marketing downstream-focussed practice, the explanatory power of a commonly used theory, namely, the theory of planned behaviour (TPB), was empirically examined across three different contexts and critically assessed to guide future research practice.

Design/methodology/approach – TPB measures were drawn from prior studies, and inconsistent item use across contexts was observed. Quantitative studies involving from 876 to 3,191 respondents underpin this study. Each study focussed on a different behaviour, namely, walking to and from school, binge drinking and packing fruits and vegetables into lunchboxes. Hierarchical multiple linear regressions were used for data analysis.

Findings – Item use was mixed, construct reliability was not consistent and consequent findings indicated that TPB explained walking to and from school and binge drinking, but it did not explain packing fruits and vegetables into lunchboxes.

Originality/value – Theory use is recommended to enhance intervention outcomes. However, theory application remains scarce in social marketing. Moreover, when theory is used, consistent measures are not used; items are removed from constructs to obtain model fit and constructs used within the theory differ. The current study draws from three studies, all of which applied TPB to explain behaviours. Mixed outcomes were observed when the same analytical process was applied using the available measures and constructs. Close investigation of the measures used across the three studies highlights one explanation for mixed findings. In the absence of consistent application of the theory, drawing definitive conclusions about a theory's effectiveness is premature. Precise application of theoretical constructs is needed to deliver theoretically derived understanding.

Keywords Obesity, Theory of planned behaviour, Social marketing, Theory, Behaviour/attitudes

Paper type Research paper

Background

Prior research indicates that theory use can generate effective social marketing programmes (Eagle *et al.*, 2013). Theory provides a systematic way of explaining a phenomenon, by dividing a potentially complex process into constructs, concepts and steps (Eagle *et al.*, 2013). Advancing social marketing science requires a good understanding of how reported research outcomes are informed by theory. Michie and Prestwich (2010) offer a guiding framework, which can be used by researchers to understand the theoretical base of reported interventions and assess the extent to which that theory has been used by researchers using a scoring system. In time, theory use assessments could inform evidence syntheses within literature reviews and subsequent meta-analyses to determine effects of specific theories.



Use of theory in social marketing practice enables a process to be systematically replicated. Replication is an essential building block in any field of science delivering an understanding of what works (and what does not) trialled across a range of contexts, settings and timeframes. In the absence of repeated and consistent findings, we cannot draw definitive conclusions.

Given propositions that theory use can enhance effectiveness, it is surprising that application of theory in social marketing remains limited (Lefebvre, 2001; Luca and Suggs, 2013). We do acknowledge the possibility that the extent of theory use is not reported clearly (Truong, 2014) and, in moving forward, we encourage social marketing research to adopt the Michie and Prestwich (2010) framework to ensure that progress in the field can be made. The limited reporting of theory in social marketing research practice was recently summarised in Truong and Dang's (2017) review. A total of 143 social marketing studies published between 2000 and 2015 were analysed with findings demonstrating that 23 per cent explicitly mentioned theory (Truong and Dang, 2017). Similarly, Pang *et al.*'s (2017) review found that when theory was used, its reporting was limited, suggesting that theory may not be applied to its fullest extent.

Guiding principles and benchmarks for developing social marketing initiatives have been defined (Andreasen, 2002; The National Social Marketing Centre, 2011) and theory is included as one of the eight social marketing benchmarks (The National Social Marketing Centre, 2011). The extent of use of social marketing principles has been assessed (Almestahiri *et al.*, 2017; Fujihira *et al.*, 2015; Kubacki *et al.*, 2015), and research indicates that behaviour change is more likely when more of the social marketing benchmarks are applied (Carins and Rundle-Thiele, 2014; Xia *et al.*, 2016). Overall, the evidence base indicates that social marketing researchers should embed theory in their research.

Gordon and Gurrieri (2014) observed that social marketing research “lacked critical introspection” and called for more of a reflexive stance to be taken by social marketing researchers. Taken together, a review of the literature indicates a need for social marketing researchers to clearly state the purpose of a theory and most importantly to deliver clear and accurate reporting of constructs, measures and analytical processes to assist others to understand exactly how theory was used and determine whether patterns exist. Theories provide frameworks that when applied according to procedural guidelines can frame planning and decision-making in addition to teaching the next generation of practitioners. For theory to guide future efforts, it must be consistently applied which requires full measurement of all theoretical constructs using consistent measures, consistent scale formation practices and consistent analytical procedures ensuring that boundary conditions are identified. Incomplete theory application or inconsistent application of constructs (measures) and analytical techniques prevent a clear picture from emerging, given models cannot be directly compared.

Downstream social marketing focusses attention on individuals to understand how behaviours can be modified to deliver the desired change (Brennan *et al.*, 2014). Downstream (also termed micro in system views) efforts continue to dominate social marketing practice (Almestahiri *et al.*, 2017). Consistent with dominant practice, this study focusses on downstream applications. The theory of planned behaviour (TPB) focusses research attention on individuals, consistent with downstream social marketing practice and is one of the most frequently used theories in social marketing (Lefebvre, 2001). In Truong's (2014) review, TPB was the second most used theory in social marketing. Focussing on planned behaviours, TPB proposes that one's intention to perform a specific behaviour is the central determinant of that behaviour being performed in practice (Ajzen and Fishbein, 1980). Intention is determined by a combination of attitudes towards the behaviour, subjective

norms (SNs) and perceived behavioural control (PBC). According to [Ajzen and Fishbein \(1980\)](#), the more positive the attitude, the more favourable the social norms, and the greater the PBC, the stronger the intention to perform the behaviour under consideration. Higher intentions translate into more incidences of performing the behaviour.

Four key constructs are outlined in TPB. First, *attitude(s)* towards the behaviour refers to personal favourable or unfavourable perceptions of the behaviour ([Ajzen, 2011](#)). Second, SNs correspond to the social pressure from significant others to engage (or not) in a behaviour. Third, PBC is attributed to the perception of existence or absence of resources and opportunities to execute a behaviour, and how easy or difficult the behaviour is to perform. Finally, *intentions* are an indication on how much effort and dedication people have towards performing (more of the) desired behaviour.

Critiques of TPB can be found in the literature, and its validity has been questioned. Some authors have argued that TPB can account for only a small amount of variance explained, having a very limited predictive capability ([Sniehotta et al., 2014](#)), acknowledging wider social and built environment constraints, which may prevent intentions turning into action. Others have questioned the generalisability of the attitude scale ([French and Hankins, 2003](#)).

While TPB has its critics, other researchers have noted that TPB has been successfully applied to a range of behaviours ([Armitage and Conner, 2001](#); [Downs and Hausenblas, 2005](#); [McEachan et al., 2011](#)). For example, [Armitage and Conner's \(2001\)](#) meta-analysis investigated TPB's efficacy, by drawing on 185 studies. Findings in their meta-analytic review showed that TPB accounted for 39 per cent of variance explained in behavioural intention and 27 per cent of variance in behaviour. These reviews did not, however, report on construct and measurement differences.

In the present study, a narrative literature search identified research that had used TPB to explain behaviour in the contexts of physical activity, alcohol consumption and healthy eating. These narrative reviews are illustrated next.

Physical activity

A considerable amount of literature has been published on the use of TPB to explain or predict physical activity. Within the physical activity context, a review of the literature indicated that the variance explained by TPB in physical activity behaviour ranged from as little as 2 per cent to as much as 46 per cent. However, it is important to note that different constructs were assessed by different authors, making direct comparisons problematic. Detailed examination of the reported explanatory and predictive potential of TPB in physical activity behaviour revealed inconsistency in the predictor variables tested. Intention alone was included as a predictor variable in some studies, while others used both intention and PBC, and others tested the behaviour on all four key predictors constructs of TPB.

Studies that tested intentions as the sole predictor of behaviour accounted for different variances explained: 2 per cent ([Gardner and Hausenblas, 2006](#)), 28 per cent ([Lee, 2011](#)) and 37 per cent ([Estabrooks and Carron, 1998](#)). When intention and PBC were tested as independent variables, the average variance explained was 29 per cent. The full TPB model was also assessed in six studies, with attitude, SNs, PBC and intention being the independent variables and behaviour being the dependent variable. The average explained variance of these studies was 21 per cent ([Table I](#)). Variance explained average 46.7 per cent in behavioural intention and 25 per cent on actual behaviour for the reviewed studies on physical activity.

Studies TPB and physical activity	Year	N	Composition of Sample	Age category, young (under 18) adult (19 to 59) elderly (60 and older)	Specific behaviour	Variance in behavioural Intention explained by:			Variance in actual behaviour explained by:		
						Attitude, SN and PBC (%)	Other variables	Intention (%)	Attitude, SN, PBC and Intention (%)	Intention (%)	Other variables
Armitage	2005	94	Recruitment from private gymnasium	Young, adult and elderly	Exercise habits	49.0	-	-	22.0	-	-
Courneya and McAuley	1995	62	Volunteers recruited from an aerobics programme of a large university	Adult	Exercise class adherence	24.0	-	-	-	25.0	-
Estabrooks and Carron	1998	157	Volunteers from elderly exercise classes	Elderly	Exercise attendance	4.3	-	36.7	-	37.8	-
Gardner and Hausenblas	2006	117	Young Men's Christian Association members	Adult and elderly	Exercise class adherence	47.0	-	2.0	2.0	5.0	-
Hamilton and White	2008	423	Ninth-grade students	Young	Moderate-to-vigorous physical activity	58.0	-	-	37.0	-	-
Lee	2011	198	Respondents recruited via Korean American-related websites	Adult	Exercise behaviour	43.0	-	28.0	-	31.0	-
MacCann, Todd and Mullan and Roberts	2015	1,017	University students	Adult	Exercise behaviour	45.0	-	-	39.0	-	-
Plotnikoff, Lubans, Trinh and Craig	2012	1,427	Randomly selected adults	Adult	Physical activity behaviour	T1: 29.0 T2: 21.0	-	-	-	T1: 9.0 T2: 22.0	-
Ryn, Lytle and Kirscht	1996	185	Telephone company employees	Adult	Exercise behaviour	24.0	Measured Self-efficacy as PBC	-	-	20.0	Measured Self-efficacy as PBC
Theodorakis	1992	98	Young swimmers	Young	Participation in team's training (swimming)	50.0	-	-	46.0	-	-

Table I. Summary of selected studies using TPB in physical activity context

Alcohol consumption

A second review of the literature was undertaken in the context of alcohol consumption. [Table II](#) shows selected papers. All used TPB to explain or predict alcohol consumption behaviour, with variance explained by TPB in behaviour ranging from 12 to 77 per cent.

Only 2 of the 10 studies reviewed demonstrated a variance in behaviour explained by the TPB lower than 30 per cent. Most of the studies found that TPB could explain in the range of 30 to 40 per cent variance in alcohol consumption behaviour. Two other studies explained behaviour by more than 55 per cent, demonstrating an extremely high explanatory potential for TPB to explain alcohol-drinking behaviour. Inconsistencies in construct and item use were once again noted in the alcohol context.

Healthy eating

TPB use in the healthy eating context was finally considered. Healthy eating is a complex issue, as it can be conceptualised, and thus measured, in different ways ([Bisogni et al., 2012](#); [Falk et al., 2001](#)). The present narrative search included studies that had framed their research within a wider healthy eating context and used TPB to either explain or predict behaviour and/or behavioural intention. Only four of the studies reviewed used TPB to test actual behaviour. The others tested behavioural intention alone. Given the inherent complexity of healthy eating, comparisons between studies and their measures were particularly problematic. The papers selected in the review reported that TPB explained variance ranged from 17 to 58 per cent in the healthy eating behaviour context. Once again, there were inconsistencies in the constructs used to test the explanatory and predictive potential of the theory in this behaviour. [Table III](#) outlines the results of the review.

Taken together, these reviews of social marketing literature indicated dominant downstream social marketing practice, limited theory use and, in the cases where theory is evident, variability in theory application. A reflexive turn calls for a critical stance to be taken ([Gordon and Gurreri, 2014](#)). Examination of downstream applications that focus attention on individual planned behaviours indicates a lack of consistent application of TPB, with different constructs and items (wording and number of items) evident across studies.

The current study contributes to understanding in two ways. First, it contributes to social marketing research practice by offering a detailed explanation of TPB use in three studies that is consistent with current dominant social marketing practice. A consistent analytical approach is taken to assess TPB in three contexts, and all constructs ($n = 4$) and items are reported in full delivering an example of clear and accurate reporting to assist others to understand exactly how TPB was used in the three social marketing studies forming the basis for this critical appraisal. Second, this study contributes to social marketing science by offering a critical stance to advance understanding and research practice in social marketing and social sciences more broadly.

Method

Existing data were accessed permitting a reflexive stance to be taken. Three studies selected from one social marketing research centre were used in the current study. Each study focussed on one behaviour; walking to and from school (Study A), binge drinking (Study B) and fruits and vegetables packed into lunchboxes (Study C). All studies were undertaken in a population aged 16 years and under. The three studies were used to examine the explanatory potential of TPB using the constructs and measures included in the studies, which reflects current social marketing research practice.

Studies (TPB and alcohol consumption)	Year	N	Composition of Sample	Age category: young (under 18) adult (19 to 59) elderly (60 and older)	Specific behaviour	Variance in behavioural Intention explained by:			Variance in actual behaviour explained by:		
						Attitude, SN and PBC (%)	Other variables	Intention (%)	Attitude, SN, PBC and Intention (%)	Other variables	
Comer, Warren, Close and Sparks	1999	Study 1: 115 Study 2: 111 Study 3: 159	University students	Adult	Units of alcohol consumed	Study 1: 33.8 Study 2: 28.0 Study 3: 39.9	-	-	Study 1: 39.8 Study 2: 37.7 Study 3: 12.0	-	-
Duncan, Forbes-McKay and Henderson	2012	130	Pregnant Women	Adult	Alcohol consumption	59.3	-	-	-	57.1 to 77.1	-
French and Cooke	2012	181	Students attending the union bar	Adult	Number of alcoholic drinks consumed	55.0	-	-	32.0	-	-
Gardner, De Bruijn and Lally	2012	128	Full-time university students	Adult	Binge-drinking behaviour	56.0	Gender was controlled	-	35.0	-	-
Hagger, Lonsdale, Hein, Koka, Lintunen, Pasi, <i>et al.</i>	2012	486	Company employees	Adult	Binge drinking occasions	69.0	-	31.0	-	-	-
Huchting, Lac and LaBrie	2008	247	Female sorority members at a university	Adult	Maximum number of standard drinks consumed on one occasion	44.7	-	-	-	73.4	-
Mullan, Wong, Allom and Pack	2011	153	University students	Adult	Maximum number of drinks consumed on one occasion	-	-	37.6	-	-	-
Norman, Armitage and Quigley	2007	79	Undergraduate university students	Adult	Binge-drinking behaviour	58.0	Self-efficacy was also assessed	-	22.0	-	Self-efficacy was also assessed

(continued)

Table II. Summary of selected studies using TPB in alcohol consumption context

Studies TPB and alcohol consumption	Year	N	Composition of Sample	Age category: young (under 18) adult (19 to 59) elderly (60 and older)	Specific behaviour	Variance in behavioural Intention explained by:		Variance in actual behaviour explained by:	
						Attitude, SN and PBC (%)	Other variables	Attitude, SN, PBC and Intention (%)	Other variables
Schlegel, Davernias, Zanna, DeCourville	1992	1,325	12-year longitudinal study	Young and Adult	Frequency of getting drunk	57.0	Drinker group was also assessed	38.0	Drinker group was also assessed
Manske Manske Todd and Mullan	2011	122	Female undergraduate university students	Young and adult	Binge-drinking behaviour	55.2	-	40.4	-

Studies TPB and healthy eating	Year	N	Composition of Sample	Age category, young (under-18) adult (19 to 59) elderly (60 and older)	Specific behaviour	Variance in behavioural Intention explained by:		Variance in actual behaviour explained by:	
						Attitude, SN and PBC (%)	Other variables	Attitude, SN, PBC and Intention (%)	Intention and PBC (%)
Beale and Manstead	1991	162	Mothers of 5- to 7-month-old babies	Young	Prevention of infants' sugar consumption	T1: 15.6 T2: 27.1	-	-	-
Dunn, Mohr, Wilson and Wittert	2011	404	Random adults	Adult	Fast-food consumption	50.0	-	50.0	-
Grønhoj, Bech-Larsen, Chan and Tsang	2012	410	Students studying in Grade 6 to Grade 10	Young	Healthy eating	37.0	Controlled for age, sex and BMI	-	-
Hewitt and Stephens	2007	261	Children who volunteered to participate	Young	Dietary behaviour	51.0	Healthy eating belief was also assessed	39.0	44.0
Kothe, Mullan and Butow	2006	194	Undergraduate students from a wide range of disciplines who were undertaking a 1st year psychology course	Young and Adult	Fruit and vegetable consumption	T1: 44.5 T2: 55.1	-	T1: 16.8 T2: 24.3	-
Mullan, Wong and Kothe	2013	605	Secondary school aged adolescents	Young	Breakfast consumption	42.2	Controlled for gender and country	-	57.8

(continued)

Table III. Summary of selected studies using TPB in healthy eating context

Table III.

Studies TPB and healthy eating	Year	N	Composition of Sample	Age category: young (under 18) adult (19 to 59) elderly (60 and older)	Specific behaviour	Variance in behavioural Intention explained by:		Variance in actual behaviour explained by:		
						Attitude and PBC (%)	SN and other variables	Intention and PBC (%)	Attitude, SN, PBC and Intention (%)	Other variables
Muzaffar, Chapman-Novakofski, Castelli and Scherer	2014	127	Active online learning group of a web-based intervention	Young	Healthy eating	58.6	-	-	-	-
Oygaard and Rise	1996	527	Follow-up of longitudinal study	Adult	Eat healthier	32.0	-	-	-	-
Pawlak and Malinauskas	2008	157	Ninth-grade students	Young	Fruits consumption	77.2	-	-	-	-
Pawlak, Malinauskas and Rivera	2009	108	University baseball players	Adult	Healthy eating	70.0	-	-	-	-

Study A – walking to and from school

A total of 2,001 carers of children aged 5-12 years participated in this study. Study A focussed on children's physical activity (specifically walking to and from school behaviour) in Victoria, Australia. Data were collected in September 2015. The survey was completed by the carers of children aged 5-13 years due of the fact that they were the decision makers of the target behaviour (Schuster *et al.*, 2016). Children's behaviour was measured by the number of times that a child walked to and from school in the previous week, as reported by parents or carers. Intentions were measured using seven-point unipolar scales, where 1 indicated negative intentions and 7 positive intentions to perform the behaviour (Rundle-Thiele *et al.*, 2013). Attitudes were measured using a semantic differential scale, with a total of eight bipolar items measuring attitudes towards walking to and from school, where -3 indicated negative attitude and +3 positive attitude (Scott *et al.*, 2007). SNs and PBC items consisted of unipolar scales, in which -3 was "Strongly disagree" and +3 was "Strongly agree". Items were sourced from Rhodes and Courneya (2003). All items are reported in Table IV.

Study B – binge drinking

A total of 3,191 students aged 14-16 years participated in Study B, which aimed to understand adolescent binge drinking. Data collection was undertaken in Queensland, Australia, in 2015. Binge-drinking behaviour was measured using the alcohol use disorders identification test (AUDIT) (Babor *et al.*, 2001). Binge drinking in this study was defined as more than six standard drinks in any one day (Dietrich *et al.*, 2015). Intentions to perform the behaviour were measured using unipolar scales from 1 to 7 (Fishbein and Ajzen, 2011; Norman and Conner, 2006). Attitudes were measured with seven-point bipolar scales, where the respondents had to choose from bipolar adjectives such as "harmful-beneficial" (Fishbein and Ajzen, 2011; Norman and Conner, 2006; Ravis and Sheeran, 2013). SNs and PBC were measured using seven-point unipolar scales (Fishbein and Ajzen, 2011; Norman and Conner, 2006). For items details, see Table IV.

Study C – packing fruits and vegetables into lunchboxes

A total of 876 caregivers participated in this study. Study C focussed on healthy eating (specifically, packing fruits and vegetables in lunchboxes for children). Once again, the survey was undertaken by the carers of the children, as they were the decision makers of the target behaviour (Casado and Rundle-Thiele, 2015). Behaviour was measured using two food checklist items (Sanigorski *et al.*, 2008) capturing the serves of fruits and vegetables packed into the child's lunchbox, as reported by the parent. Intentions were assessed with bipolar scales, ranging from -3 to +3 (Ajzen and Fishbein, 1980). Attitudes were investigated using seven-point scales with bipolar adjectives such as "unhealthy-healthy" (Scott *et al.*, 2007). SNs' measures included seven-point unipolar scales, depicting whether the respondent agreed with statements (Sharifrad *et al.*, 2013; Drummond and Sheppard, 2011). PBC was assessed using statements of control, in which the respondents had to choose on a seven-point scale, whether they agreed with each statement (Bathgate and Begley, 2011; Dunn *et al.*, 2011). PBC measures were adapted from two studies, one about packing lunchboxes and the other focussed on fast food consumption. Table IV outlines all items used in this study.

Lastly, hierarchical multiple regression was undertaken to test the model shown in Figure 1.

Consistent with theoretical underpinnings outlined by TPB, Step 1 tested the influence that behavioural intention had on actual behaviour. Step 2 included PBC in the model and

Table IV.
Items measured in
each study

Constructs	Study A	Study B	Study C
Intentions	<p>I intend to increase the number of times the child walks to/from school during the next week. [Extremely unlikely Extremely likely]</p> <p>I will increase the number of times the child walks to/from school during the next week. [Extremely unlikely Extremely likely]</p> <p>I plan to increase the number of times the child walks to/from school during the next week. [Extremely unlikely Extremely likely]</p> <p>Walking to/from school is: [Unhealthy Healthy]</p> <p>Walking to/from school is: [Unimportant Important]</p> <p>Walking to/from school is: [Boring Exciting]</p> <p>Walking to/from school is: [Unpleasant Pleasant]</p> <p>Walking to/from school is: [Unenjoyable Enjoyable]</p> <p>Walking to/from school is: [Harmful Beneficial]</p> <p>Walking to/from school is: [Bad Good]</p>	<p>Do you intend to binge drink over the next 2 weeks? [Strongly disagree Strongly agree]</p> <p>I will binge drink over the next 2 weeks. [Definitely false] Definitely true]</p> <p>How likely is it that you will binge drink over the next 2 weeks? [Extremely unlikely Extremely likely]</p> <p>Binge drinking over the next 2 weeks would be: [Bad Good]</p> <p>Binge drinking over the next 2 weeks would be: [Foolish Wise]</p> <p>Binge drinking over the next 2 weeks would be: [Harmful Beneficial]</p> <p>Binge drinking over the next 2 weeks would be: [Unpleasant Pleasant]</p> <p>Binge drinking over the next 2 weeks would be: [Unenjoyable Enjoyable]</p>	<p>I intend to provide more healthy lunches for my child [Extremely unlikely Extremely likely]</p> <p>I will increase the number of times my child has a healthy lunch [Extremely unlikely Extremely likely]</p> <p>I plan to increase the number of times my child has a healthy lunch [Strongly disagree Strongly agree]</p> <p>To me, lunchbox food packed at home is: [Unhealthy Healthy]</p> <p>To me, lunchbox food packed at home is: [Unimportant Important]</p> <p>To me, lunchbox food packed at home is: [Boring Interesting]</p> <p>To me, lunchbox food packed at home is: [Unpleasant Pleasant]</p> <p>To me, lunchbox food packed at home is: [Unenjoyable Enjoyable]</p> <p>To me, lunchbox food packed at home is: [Harmful Beneficial]</p> <p>To me, lunchbox food packed at home is: [Bad Good]</p> <p>To me, lunchbox food packed at home is: [Expensive Inexpensive]</p> <p>Most people who are important to me think that I should provide a healthy lunch for my child [Strongly disagree Strongly agree]</p> <p>My community expects parents to actively contribute to a healthy school community [Strongly disagree Strongly agree]</p>
Attitudes	<p>Walking to/from school is: [Unimportant Important]</p> <p>Walking to/from school is: [Boring Exciting]</p> <p>Walking to/from school is: [Unpleasant Pleasant]</p> <p>Walking to/from school is: [Unenjoyable Enjoyable]</p> <p>Walking to/from school is: [Harmful Beneficial]</p> <p>Walking to/from school is: [Bad Good]</p>	<p>Binge drinking over the next 2 weeks would be: [Bad Good]</p> <p>Binge drinking over the next 2 weeks would be: [Foolish Wise]</p> <p>Binge drinking over the next 2 weeks would be: [Harmful Beneficial]</p> <p>Binge drinking over the next 2 weeks would be: [Unpleasant Pleasant]</p> <p>Binge drinking over the next 2 weeks would be: [Unenjoyable Enjoyable]</p>	<p>To me, lunchbox food packed at home is: [Unhealthy Healthy]</p> <p>To me, lunchbox food packed at home is: [Unimportant Important]</p> <p>To me, lunchbox food packed at home is: [Boring Interesting]</p> <p>To me, lunchbox food packed at home is: [Unpleasant Pleasant]</p> <p>To me, lunchbox food packed at home is: [Unenjoyable Enjoyable]</p> <p>To me, lunchbox food packed at home is: [Harmful Beneficial]</p> <p>To me, lunchbox food packed at home is: [Bad Good]</p> <p>To me, lunchbox food packed at home is: [Expensive Inexpensive]</p> <p>Most people who are important to me think that I should provide a healthy lunch for my child [Strongly disagree Strongly agree]</p> <p>My community expects parents to actively contribute to a healthy school community [Strongly disagree Strongly agree]</p>
Injunctive norms	<p>Walking to/from school is: [Worthless Valuable]</p> <p>People who are important to me think the child should/should not walk to/from school. [Should not Should]</p> <p>People who are important to me would disapprove/approve of the child walking to/from school. [Disapprove Approve]</p> <p>People who are important to me want the child to walk to/from school. [Strongly disagree Strongly agree]</p>	<p>Most people who are important to me think I _____ binge drink in the next 2 weeks. [Should not Should]</p> <p>Most people who are important to me want me to binge drink in the next 2 weeks. [Disagree Agree]</p> <p>Most people whose opinions I value think that it is _____ for me to binge drink in</p>	<p>To me, lunchbox food packed at home is: [Expensive Inexpensive]</p> <p>Most people who are important to me think that I should provide a healthy lunch for my child [Strongly disagree Strongly agree]</p> <p>My community expects parents to actively contribute to a healthy school community [Strongly disagree Strongly agree]</p>

(continued)

Constructs	Study A	Study B	Study C
Descriptive norms	<p>Many of my friends' children walk to/from school. [Strongly disagree Strongly agree]</p> <p>Many of my family members' children walk to/from school. [Strongly disagree Strongly agree]</p> <p>Many of the children in the neighbourhood walk to/from school. [Strongly disagree Strongly agree]</p> <p>Many children at the child's school walk to/from school. [Strongly disagree Strongly agree]</p>	<p>the next 2 weeks. [Inappropriate Appropriate]</p> <p>Most people whom I respect and admire would _____ me binge drinking in the next 2 weeks. [Oppose Support]</p> <p>Most people who are important to me _____ binge drink. [Do not Do]</p> <p>How many of the people whom you respect and admire binge drink? [Very few Virtually all]</p>	<p>I want my child to eat the same food his/her friends eat [Strongly disagree Strongly agree]</p> <p>My child's friends belittle him/her for eating healthy food such as fruit and vegetables [Strongly disagree Strongly agree]</p> <p>My child's school/class actively promotes healthy eating [Strongly disagree Strongly agree]</p>
PBC	<p>Whether the child walks to/from school in the next week is entirely up to me. [Strongly disagree Strongly agree]</p> <p>How much personal control do you feel you have over the child walking to/from school in the next week? [Very little control Complete control]</p> <p>How much do you feel that the child walking to/from school next week is beyond your control? [Very much Not at all]</p>	<p>How much control do you have over whether you binge drink? [No control Fully in control]</p> <p>You feel in complete control over whether you binge drink. [Strongly disagree Strongly agree]</p> <p>How much do you feel that whether you binge drink is beyond your control? [Strongly disagree Strongly agree]</p> <p>How much will factors outside your control influence whether you binge drink? [Strongly disagree Strongly agree]</p>	<p>Ensuring that my child eats a healthy lunch at school is a simple task [Strongly disagree Strongly agree]</p> <p>There are many health lunch options available from the school canteen/tuckshop that I can purchase for my child [Strongly disagree Strongly agree]</p> <p>There are many healthy options available from the supermarket I can purchase for packing in my child's lunchbox [Strongly disagree Strongly agree]</p>

Table IV.

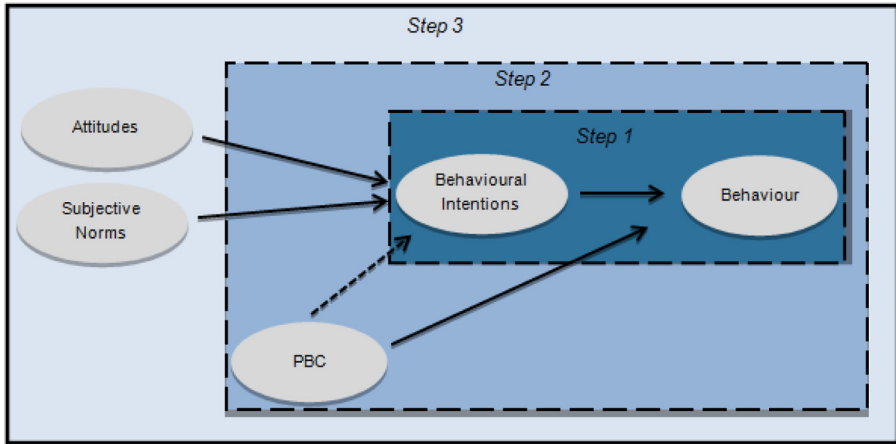


Figure 1.
Model testing the
TPB's effectiveness

Source: TPB model sourced from Ajzen (1991). Relationship from PBC to intentions in dashed arrow was not tested in hierarchical regression

tested the explanatory potential of intention and PBC in behaviour. Finally, Step 3 tested all constructs of TPB, to ascertain whether the variance in behaviour explained was increased by including all TPB constructs into the explanatory model. A hierarchical approach permitted the additive contribution of each construct to be partitioned and considered separately.

Results

Prior to statistical analyses, reliability was estimated for all TPB constructs in all three contexts. All Cronbach's alpha coefficients exceeded 0.7 (Table V) with the exception of SNs and PBC in Study C for which reliability scores were 0.66 and 0.58, respectively.

Results of hierarchical regressions in which the analytical approach was replicated across all three studies are presented in Table VI.

Study A – walking to and from school

Only intention was entered in the first step, explaining 10.1 per cent of the variance in walking behaviour. Step 2 accounted for 13 per cent of variance, with the addition of PBC. After entry of all TPB constructs in the Step 3 of the hierarchical regression, the total variance explained by the model was 28.7 per cent, $F(4, 1752) = 175.911, p < 0.05$. The inclusion of attitude and SNs explained an additional 15.6 per cent of the variance in walking to and from school behaviour, after controlling for intention and PBC

Cronbach's alpha	Study A	Study B	Study C
Intention	0.99	0.95	0.91
Attitude	0.95	0.87	0.83
SNs	0.85	0.91	0.66
PBC	0.80	0.83	0.58

Table V.
Cronbach's alpha

DV: behaviour	Step 1			Step 2			Step 3					
	B	β	sr ²	Significance	B	β	sr ²	Significance	B	β	sr ²	Significance
<i>Study A – Walking to and from school</i>												
(Constant)	0.940			0.000	-0.680			0.007	-4.664			0.000
Intentions	0.607	0.318	0.101	0.000	0.543	0.285	0.078	0.000	0.209	0.109	0.010	0.000
PBC					0.347	0.173	0.029	0.000	0.235	0.117	0.013	0.000
Attitudes									0.154	0.059	0.003	0.005
SNS									1.116	0.422	0.139	0.000
Sig	0.000				0.000				0.000			
R ²	0.101				0.130				0.287			
Adj. R ²	0.101				0.129				0.285			
F-value	197.628				131.205				175.911			
<i>Study B – Binge drinking</i>												
(Constant)	-1.363			0.000	-0.329			0.265	-1.828			0.000
Intentions	2.250	0.602	0.362	0.000	2.213	0.592	0.341	0.000	1.522	0.407	0.078	0.000
PBC					-0.169	-0.062	0.004	0.000	-0.111	-0.040	0.002	0.010
Attitudes									0.400	0.117	0.008	0.000
SNS									0.690	0.176	0.015	0.000
Sig	0.000				0.000				0.000			
R ²	0.362				0.366				0.398			
Adj. R ²	0.362				0.366				0.397			
F-value	1447.705				735.208				419.797			
<i>Study C – Packing healthy lunchboxes</i>												
(Constant)	1.205			0.000	1.204			0.000	1.284			0.000
Intentions	0.011	0.019	0.000	0.708	0.011	0.019	0.000	0.710	0.001	0.001	0.000	0.983
PBC					0.000	0.000	0.000	0.994	-0.013	-0.023	0.000	0.665
Attitudes									0.144	0.131	0.015	0.015
SNS									-0.044	-0.062	0.004	0.236
Sig	0.708				0.932				0.135			
R ²	0.000				0.000				0.018			
Adj. R ²	0.002				0.005				0.008			
F-value	0.140				0.070				1.767			

Table VI.
Hierarchical multiple regressions

$\Delta R^2 = 0.156$, $\Delta F(2, 1752) = 192.037$ and $p < 0.05$. In the final step, all four measures were statistically significant. Unstandardised (B) and standardised (β) regression coefficients and squared semi-partial (or “part”) correlations (sr^2) for each predictor on each step of the hierarchical multiple regression are reported in [Table V](#). SNs explained 13.9 per cent of the variance in walking to and from school.

The results of the adjusted R^2 show that TPB can explain 29 per cent of the variance in walking to and from school behaviour.

Study B – adolescent binge drinking

In Step 1, only intention was tested, which accounted for 36.2 per cent of the variance explained in this behaviour. When PBC was added to the regression, the model improved by 0.004 ($R^2 = 0.366$). In Step 3, the whole TPB was tested and explained 39.8 per cent of the variance in behaviour: $R^2 = 0.398$, $F(4, 2544) = 419.797$ and $p < 0.05$. The increase in R^2 from 0.366 to 0.398 was statistically significant: $\Delta R^2 = 0.032$, $\Delta F(2, 2544) = 66.536$ and $p < 0.05$. In the final model, all four measures were statistically significant. [Table V](#) presents further detail for each of the predictors. Intentions explained 7 per cent of the variance in binge-drinking behaviour.

Study C – packing fruit and vegetables into lunchboxes

Following the same steps applied in the previous two studies, statistical analyses were undertaken in Study C, using hierarchical multiple regression. Analysis of the results in each of the three hierarchical multiple regression steps in Study C show that the model is not statistically significant (Significance = 0.135, $R^2 = 0.018$ and adjusted $R^2 = 0.008$). Given that the TPB is mostly effective in explaining cognitive behaviours, such as packing fruits and vegetables into a child’s lunchbox, it is interesting that the model was not statistically significant. A reason associated with the insignificance of the model in Study C was the lack of measure precision.

Discussion

This study accessed existing data drawing from available TPB constructs and measures. Access to existing studies permitted a reflexive stance to be taken, as recommended by [Gordon and Gurrieri \(2014\)](#). Three studies that had applied TPB were analysed using a replicated hierarchical regression analytical technique to align data analysis to the theoretical underpinnings. This study contributes to social marketing research practice in two main ways. First, the current study offers a detailed explanation of TPB use in three studies. Second, this study contributes to social marketing science offering a critical stance to advance understanding to inform future research practice. Each contribution will now be detailed in turn.

TPB was tested using the same constructs, namely, attitudes, SNs, PBC, intentions and behaviour. Similarly, data collection and analysis techniques were constant and included online survey data collection and the use of hierarchical regression permitting the unique role of each TPB construct to be assessed in turn. Five TPB constructs (attitudes, SNs, PBC, intentions and behaviour) were defined and (varying) items were drawn from previous studies with sources in the literature acknowledged. In each study, items were reported in full, and scales for each construct were constructed. Models were estimated for three different contexts, namely, walking to and from school (Study A), binge drinking (Study B) and fruit and vegetables packed into lunchboxes (Study C). For a theory to guide future efforts, full measurement of all theoretical constructs must occur, and scale formation practices must be transparently reported. This paper contributes in offering a detailed

explanation of TPB use by showcasing current prevailing research practices. A further contribution of the current study stems from the replication procedures used to assess a theory. Application of a consistent method highlighted that no pattern was evident for TPB.

The reflexive stance taken in this paper identified inconsistent item use across the three studies, which is consistent with past TPB practices (Hardeman *et al.*, 2005). Table IV outlines all items used in each of the three studies, and highlights item differences. Although it is important that items should be adapted to the context of each study, it is essential that adaptations are minimal. We recommend that theories be applied in a consistent manner, with all theoretical constructs included and measured specifically, precisely and clearly through scales that are consistent in wording, length and timeframes. The only changes applied to constructs should be about the context or behaviour (Table VII).

To advance social marketing's scientific understanding, consistent theory application (number of constructs) and measurement precision is needed. Different outcomes were observed in the current study, and findings presented in this study may highlight a key reason for mixed TPB conclusions drawn from the literature. In the absence of consistent construct use, equivalent wording, scale anchors and item numbers one cannot draw conclusions on the extent that TPB can (or cannot) explain behaviours. Social marketing science can improve by ensuring that constructs are consistently applied, a practice that has not occurred in the past (Tables I, II and III, where variable TPB construct use is reported across 30 studies). In the case of TPB, all four constructs, namely, attitudes, SNs, PBC and intentions, must be measured and reported in addition to behaviour. Moreover, common analytical approaches need to be applied to ensure that findings can be compared and contrasted over time. The hierarchical method used in the current study provides one possible means, permitting the unique role that each key construct plays in explaining the targeted behaviour to be uniquely considered. Taking a reflexive stance, the current study advances understanding pointing out the need for clear theoretical application and measurement precision in social marketing.

Theory use is important to inform the design and evaluation of social marketing campaigns (Andreasen, 2002). By understanding which factors explain behaviour, social marketers can focus their efforts on the variables that will have the highest impact on achieving the desired outcome. Before we can apply theory, research efforts need to firmly establish whether theories can be confidently applied. A review of the literature indicated inconsistent construct use in TPB studies. Drawing on three studies which had previously been conducted in a childhood obesity context this study assessed TPB drawing on available items, all of which had been sourced from previous studies in line with the prevailing social science practices. Mixed outcomes were observed with TPB explaining behaviour in two out of three studies. Construct reliability was not established for all four TPB constructs in the third and final study, and TPB did not explain behaviour in this study. As emphasised by Ajzen (2011), construct validity is extremely important. Although items can and should be adapted to different contexts, adaptations should be minimal and be based on previously validated items. Ajzen (2011) explains that in a typical application of TPB, three or four items are used to assess each theoretical construct. Table IV demonstrated that there were differences not only in the wording used in each construct across the three studies but also in the number of items. For example, injunctive norms were measured using three items in Study A, four items in Study B and two items in Study C, while the authors of TPB recommend minimum of three items. There were also reliability issues, indicative of poor validity for the constructs of PBC and SNs, causing a low correlation between constructs tested. The different item wording, anchors and numbers prevent definitive conclusions on TPB to be drawn, given that items are not equivalent.

Table VII.
Example of
consistently applied
measures

Constructs	Study A	Study B	Study C
PBC	<p>Whether the child walks to/from school in the next week is entirely up to me. [Strongly disagree Strongly agree]</p> <p>I feel in complete control over whether the child walks to/from school in the next week. [Strongly disagree Strongly agree]</p> <p>If I wanted to, it would be easy for me to walk the child to/from school in the next week. [Strongly disagree Strongly agree]</p>	<p>Whether I binge drink in the next week is entirely up to me. [Strongly disagree Strongly agree]</p> <p>I feel in complete control over whether I binge drink in the next week. [Strongly disagree Strongly agree]</p> <p>If I wanted to, it would be easy for me to binge drink in the next week. [Strongly disagree Strongly agree]</p>	<p>Whether the child eats a healthy lunch in the next week is entirely up to me. [Strongly disagree Strongly agree]</p> <p>I feel in complete control over whether the child eats a healthy lunch in the next week. [Strongly disagree Strongly agree]</p> <p>If I wanted to, it would be easy for me to ensure that the child eats a healthy lunch in the next week. [Strongly disagree Strongly agree]</p>

Implications, limitations and future research directions

While the importance of theory in social marketing is recognised (The National Social Marketing Centre, 2011; Eagle *et al.*, 2013), its application remains limited (Luca and Suggs, 2013; Pang *et al.*, 2017; Truong, 2014). The critical lens applied in the current study highlights the need to sharpen our measurement procedures. The practices observed in the current study can be likened to using rulers with different measurement widths. Can we really accept information if our base measurement is not standardised? More precision in measurement is needed to ensure that the perceptions being captured are equivalent. Items that are worded differently, anchored differently and scales that are constructed on varying item numbers are not equivalent measures that can be applied across contexts to comment on a theory's capacity to explain. This offers a rich avenue for future research enquiry needing urgent attention, given that current findings offer no base for replication as occurs in other scientific fields.

The results of the current study were limited to available studies, which displayed inconsistent item use. Future research extending the approach undertaken in this paper is recommended to advance understanding of TPB's explanatory potential. A future study conducted across multiple contexts that applies the same constructs, items (including wording, item anchors and equivalent item numbers) and data analysis, is recommended to permit more definitive conclusions to be drawn. Application of a precise measurement instrument across a diverse range of modifiable behaviours in different contexts will permit an understanding of which factors to focus programme design and development on and will provide an empirical base for the role that theory can play in explaining behaviours to be modified.

The current study solely focussed on TPB, even though there are many other theories in the social marketing and behaviour change literatures (e.g. social cognitive theory, hierarchy of effects model, self-determination theory, stages of change, health belief model and social identity theory). A critical approach should be applied to each theory to commence the process of assembling an evidence base that can guide future social marketing research and practice. In time, studies are needed to understand whether and which theories offer superior explanatory potential when compared to TPB to target individuals as commonly occurs in downstream social marketing practice. Additionally, studies are needed to compare and contrast the explanatory potential of downstream focussed theories such as TPB with upstream focussed theories to provide empirical evidence to support claims to move social marketing practice upstream.

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