

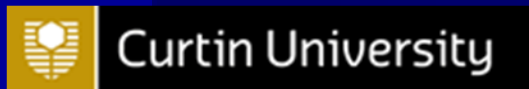
# Are psychological theories used to predict physical activity and guide physical activity behaviour change interventions any good?

Martin S. Hagger

John Curtin Distinguished Professor, Curtin University,  
Perth, Australia

Finland Distinguished Professor (FiDiPro), University of  
Jyväskylä, Finland

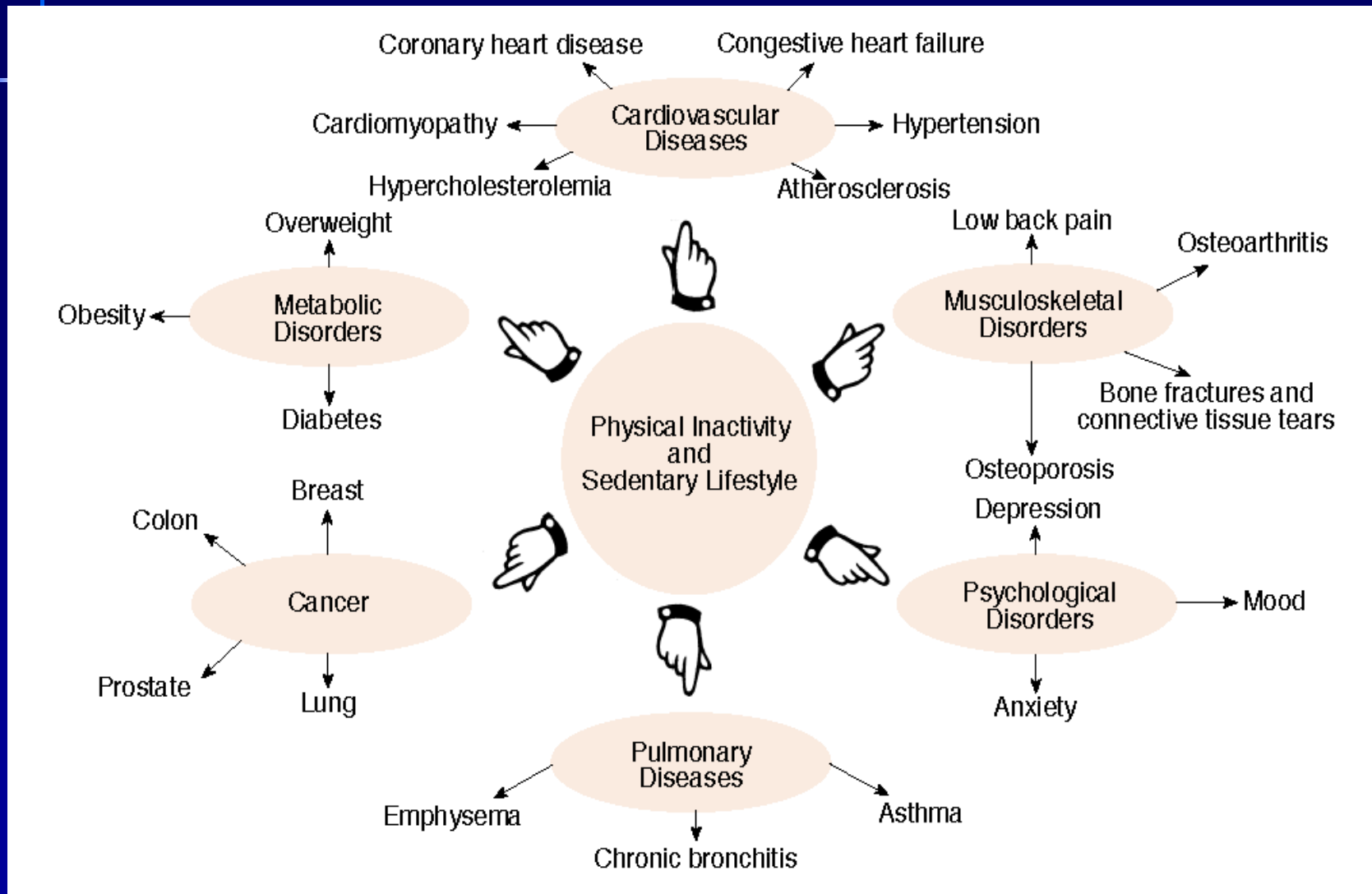
Kennedy Y. H. Wong Distinguished Visiting Professor, Hong  
Kong Baptist University, Hong Kong SAR



# Overview

- Why is theory important for physical activity interventions?
- Successes
  - Evidence base of predictors
  - Mechanisms and processes
  - Behaviour change methods
  - Effective interventions
- Does theory make interventions better?
- Limitations
  - Redundancy, weak effects
  - Intention-behaviour gap
- Solutions and practical applications

# Benefits of physical activity are well established....



**Why is theory important?**

# Why is theory important?

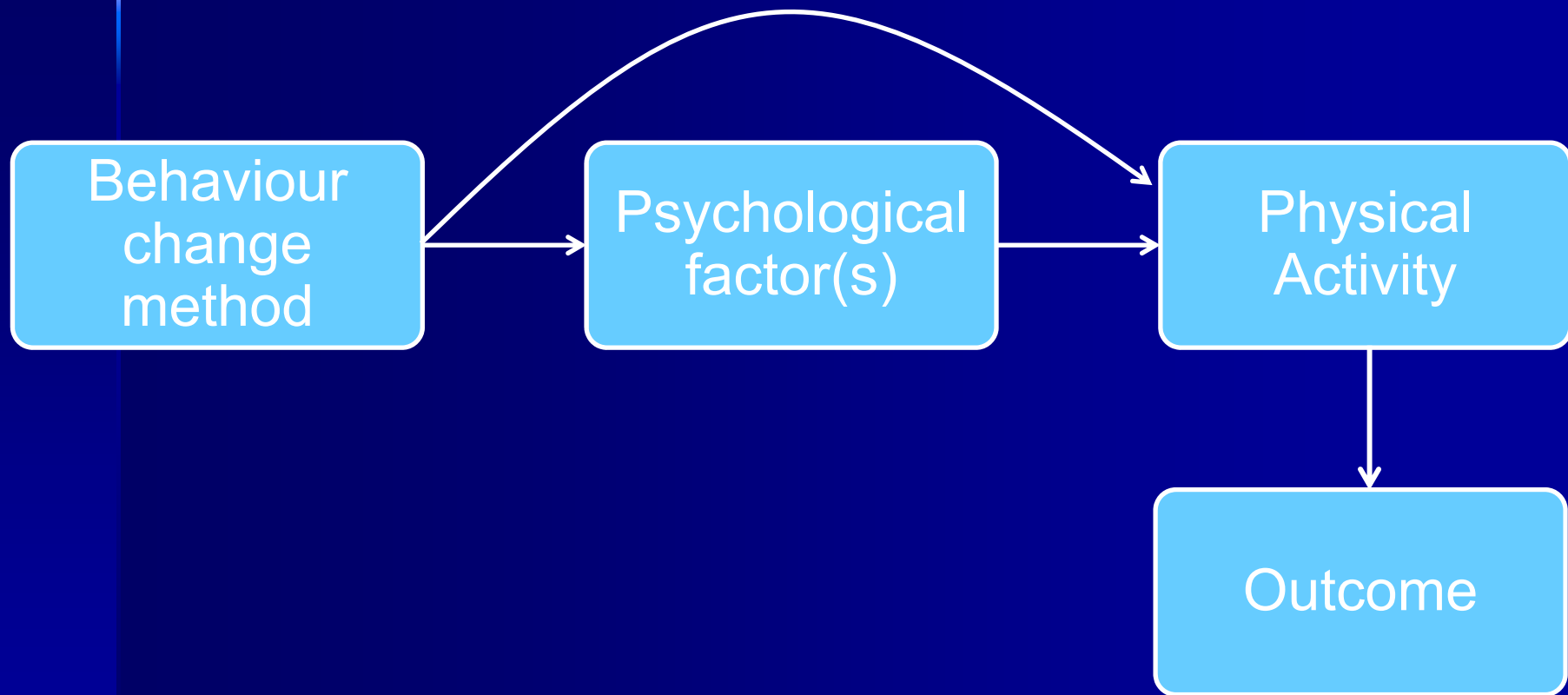
Answering the 'what' and 'how' questions

- Explanatory systems
  - Personal and social factors ('what')
  - Mechanisms responsible ('how')
  - Targets for intervention
- Pose questions/hypotheses
- Permits confirmation, rejection
- Facilitates understanding, modification, replication and practice

# Applying psychological theory to physical activity promotion

- Applied social psychology
- Motivational and social cognitive related to PA behaviour – evidence base
- Assume the factors are changeable
- Strategies or methods for change
- Content for interventions
- Evaluate and translate

# Basic Process Model for Health Behavioural Interventions



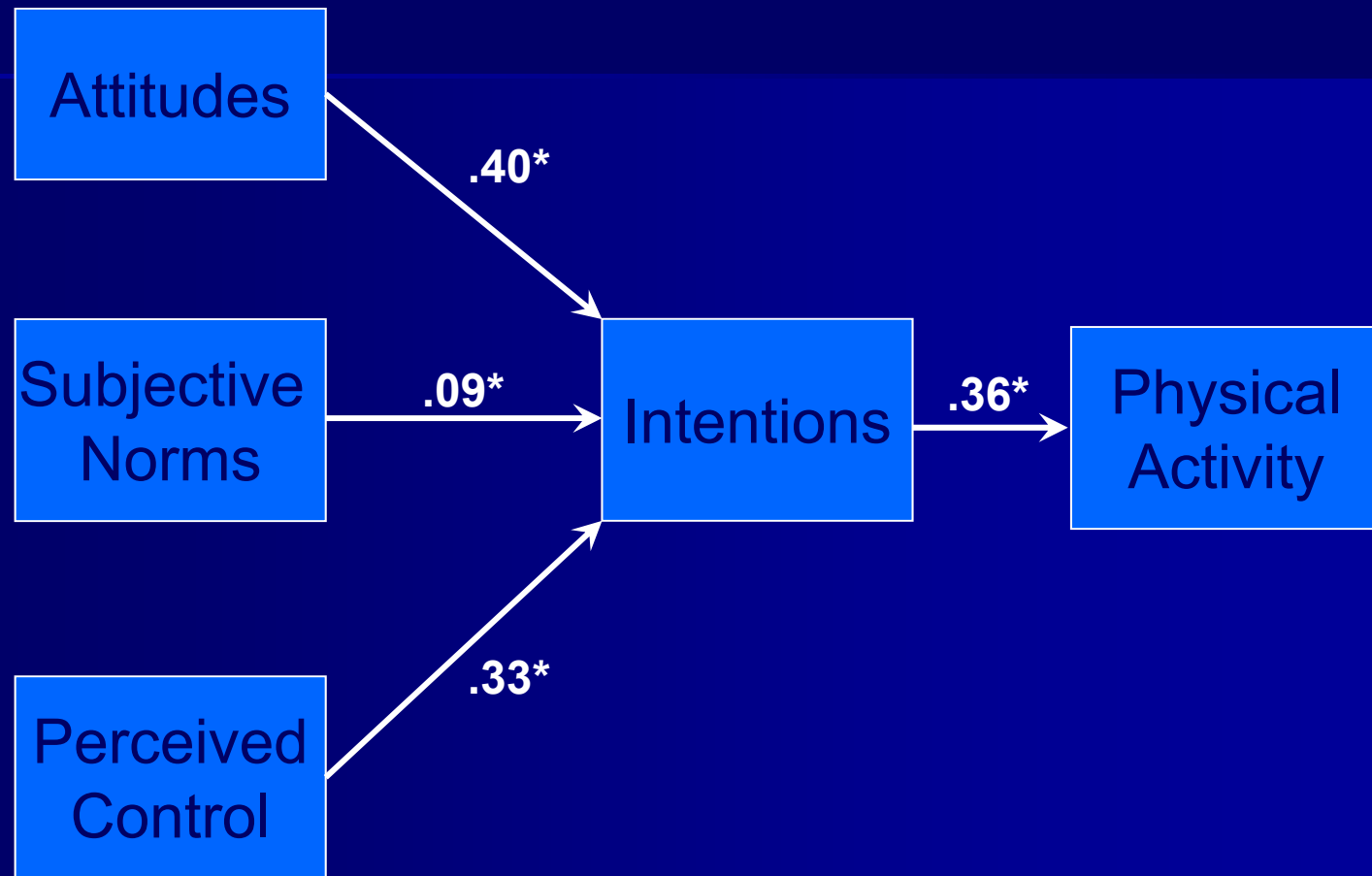
# What is a *behavioural* intervention?

- Interventions in the domain of public health
- Prevent chronic disease in long term
- Promote health outcomes & QoL
- Interventions
  - Campaigns in existing networks
    - School
    - Workplace
    - Social clubs
    - Clinical
  - Media and social media
  - One-on-one, practitioner→client
- Content: instruction, information, demonstration, prompts, exercises



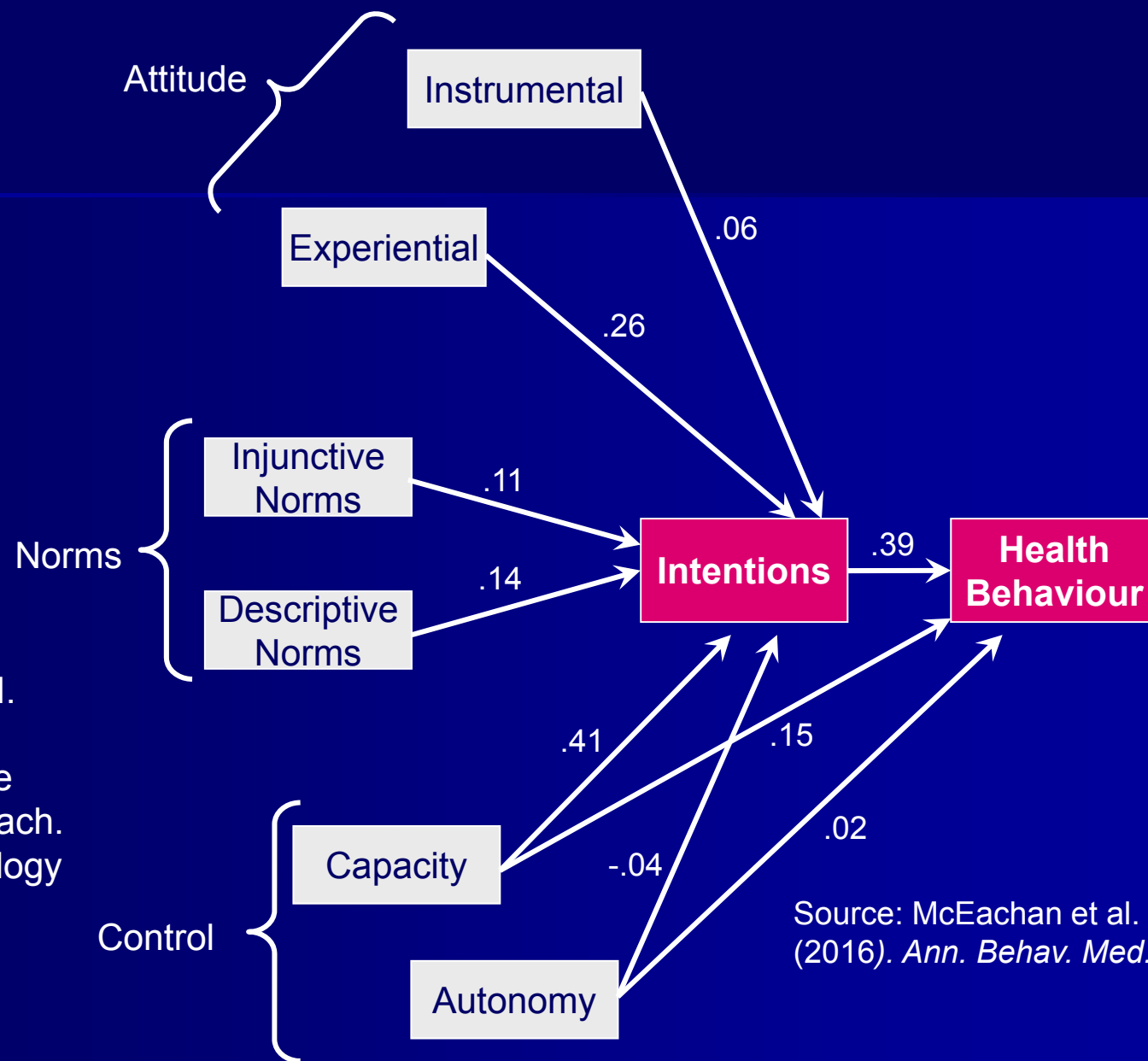
# Successful applications of theory

# Evidence Base: Syntheses of Research



Source: Hagger, Chatzisarantis and Biddle (2002). *J. Sport Exerc. Psychol.*;  
Rich, Brandes, Mullan, & Hagger (2015). *J. Behav. Med.*

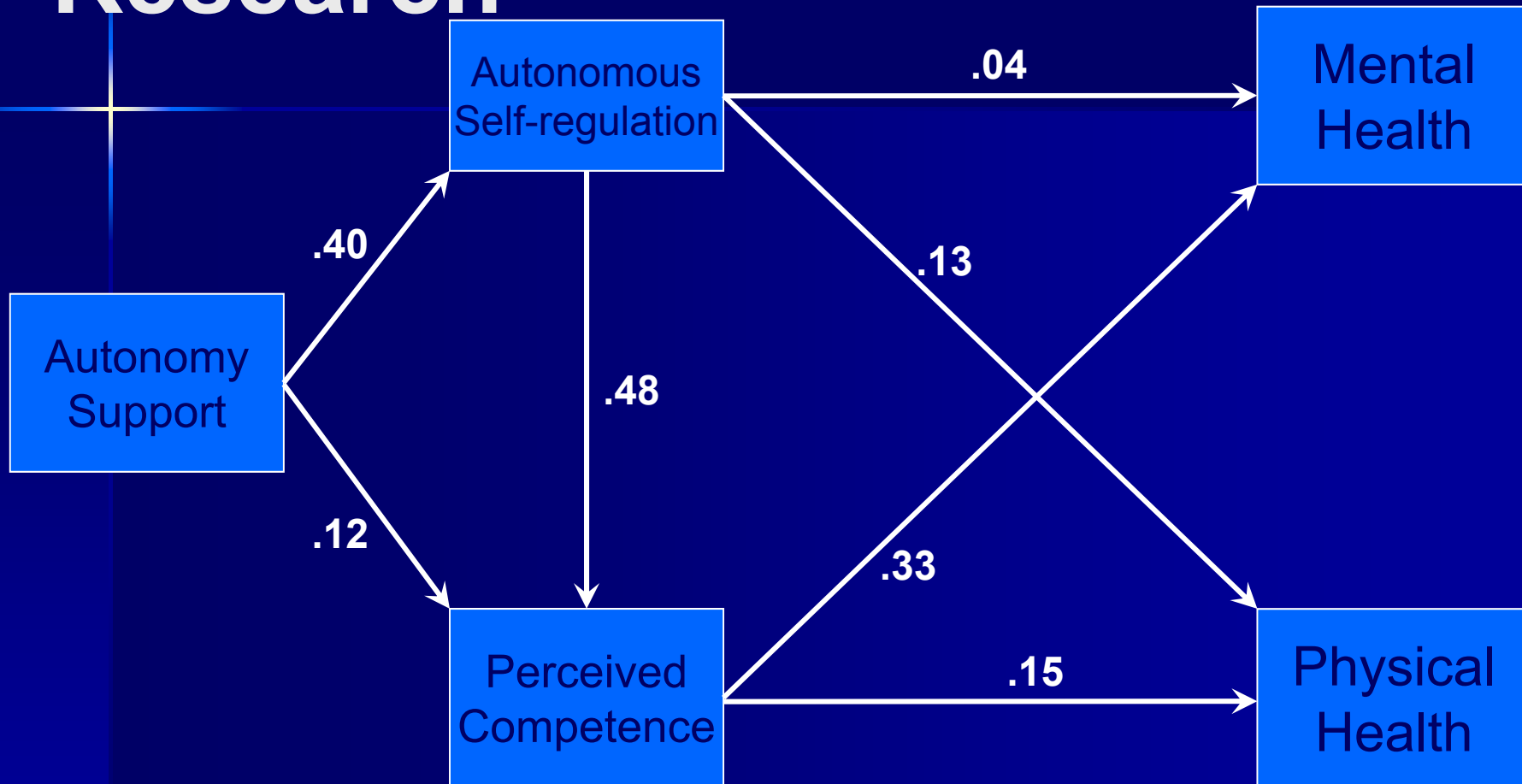
# The Reasoned Action Approach



Fishbein, M., & Ajzen, I. (2009). Predicting and changing behavior: The reasoned action approach. New York, NY: Psychology Press.

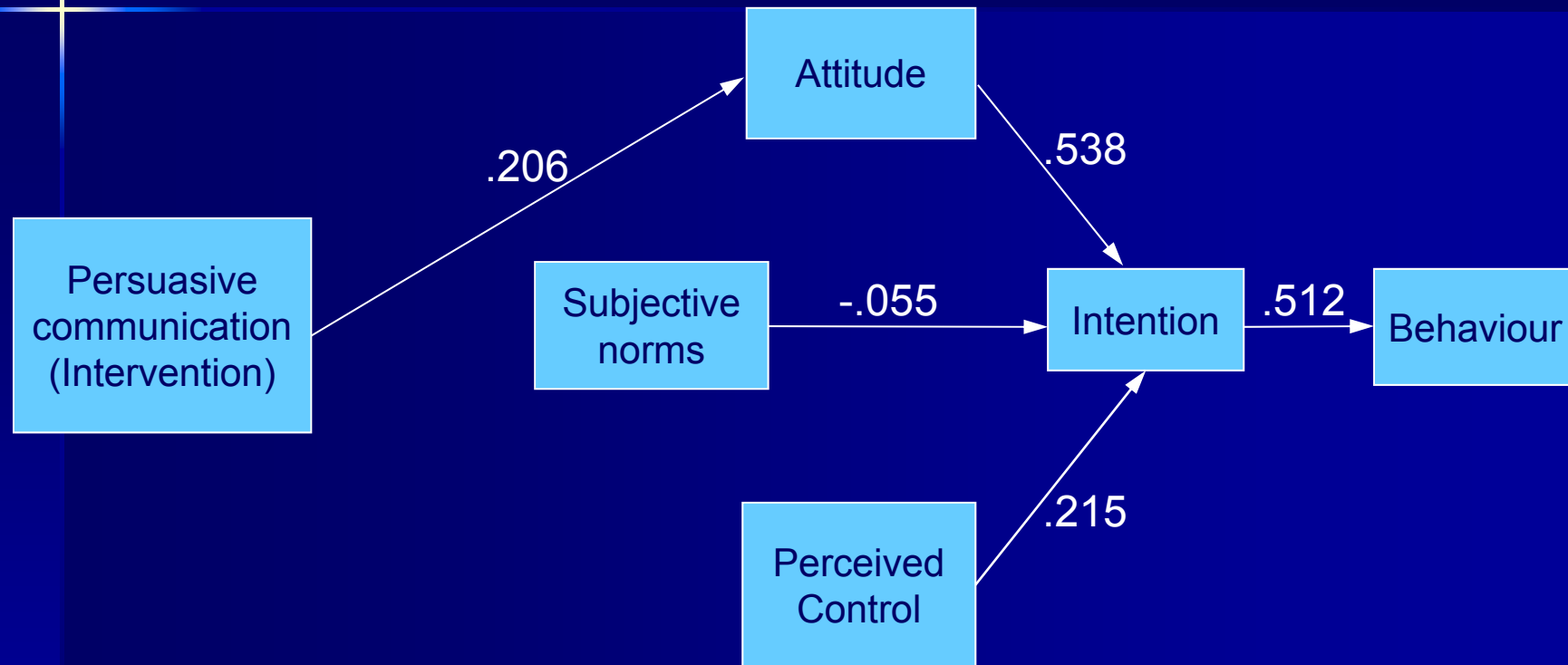
Source: McEachan et al. (2016). *Ann. Behav. Med.*

# Evidence Base: Syntheses of Research



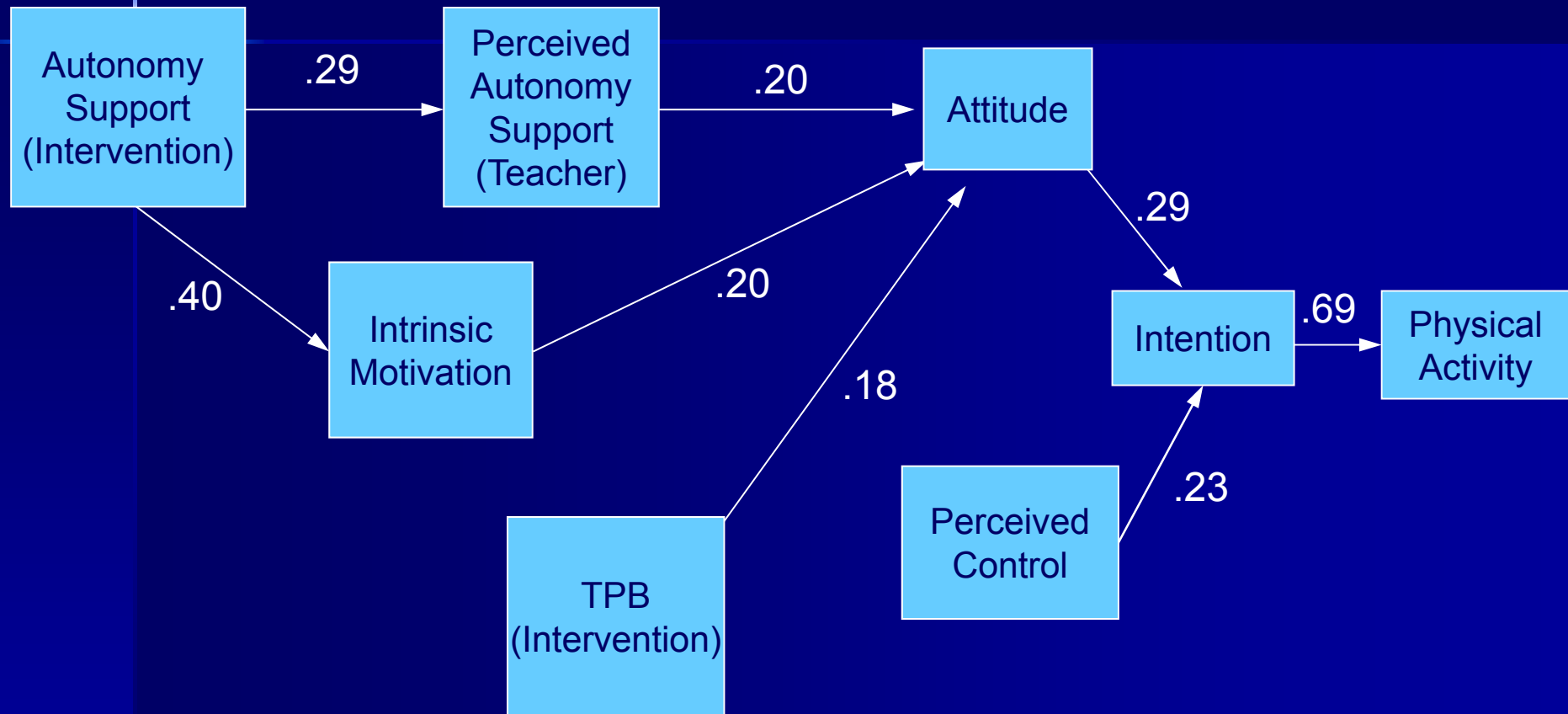
Source: Ng et al. (2012). *Perspectives on Psychological Science*.

# Promoting Physical Activity Behaviour Utilizing 'existing networks'



Source: Chatzisarantis & Hagger (2005). *J Sport Exerc Psychol*.

# Promoting Physical Activity Behaviour Utilizing 'existing networks'



Source: Chatzisarantis & Hagger (2009). *Psychology and Health*.

See also Hagger & Chatzisarantis (2016). *Review of Educational Research*.

# Behaviour Change Method

- What is a behaviour change method?
- 'Active ingredients' of behaviour change interventions
- They 'do the work' in changing behaviour
- They are irreducible and unique
- Could be seen as the 'tools' in a behaviour change 'toolbox'
- Can be used independently or in conjunction with others

# Behaviour Change 'Taxonomy'

ann. behav. med. (2013) 46:81–95  
DOI 10.1007/s12160-013-9486-6

ORIGINAL ARTICLE

## The Behavior Change Technique Taxonomy (v1) of 93 Hierarchically Clustered Techniques: Building an International Consensus for Reporting of Behavior Change Interventions

Susan Michie, DPhil, CPsychol · Michelle Richardson, CPsychol · Charles Abraham, DPhil, CPsychol · Jill I. Kinnersley, PhD · Wendy Hardeman, PhD · Martin P. Eccles, MD · Janine E. C. Wood, PhD

Published online: 20 March 2013  
© The Society of Behavioral Medicine 2013

### Abstract

**Background** CONSORT guidelines call for precise reporting of behavior change interventions: we need rigorous methods of characterizing active content of interventions with precision and specificity.

**Objectives** The objective of this study is to develop an extensive, consensually agreed hierarchically structured taxonomy of techniques [behavior change techniques (BCTs)] used in behavior change interventions.

**Methods** In a Delphi-type exercise, 14 experts rated beliefs and definitions of 124 BCTs from six published classification systems. Another 18 experts grouped BCTs

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VOL. 10, NO. 3, 297–312  
<http://dx.doi.org/10.1080/17437199.2015.1077155>

 **Routledge**  
Taylor & Francis Group

 OPEN ACCESS

## A taxonomy of behaviour change methods: an Intervention Mapping approach

Gerjo Kok<sup>a</sup>, Nell H. Gottlieb<sup>b</sup>, Gjalte-Jorn Y. Peters<sup>a,c</sup>, Patricia Dolan Mullen<sup>b</sup>, Guy S. Parcel<sup>b</sup>, Robert A.C. Ruiter<sup>a</sup>, María E. Fernández<sup>b</sup>, Christine Markham<sup>b</sup> and L. Kay Bartholomew<sup>b</sup>

<sup>a</sup>School of Psychology & Neuroscience, Maastricht University, Maastricht, MD, The Netherlands; <sup>b</sup>School of Public Health, University of Texas, Houston, TX, USA; <sup>c</sup>School of Psychology, Open University, Heerlen, DL, The Netherlands

### ABSTRACT

In this paper, we introduce the Intervention Mapping (IM) taxonomy of behaviour change methods and its potential to be developed into a coding taxonomy. That is, although IM and its taxonomy of behaviour change methods are not in fact new, because IM was originally developed as a tool for intervention development, this potential was not immediately apparent. Second, in explaining the IM taxonomy and defining the relevant constructs, we call attention to the existence of parameters for effectiveness of methods, and explicate the related distinction between theory-based methods and practical applications and the probability that poor translation of methods may lead to erroneous conclusions as to method-effectiveness. Third, we recommend a minimal set of intervention characteristics that may be reported when intervention descriptions and evaluations are published. Specifying these characteristics can greatly enhance the quality of our meta-analyses and other literature syntheses. In conclusion, the dynamics of behaviour change are such that any taxonomy of methods of behaviour change needs to acknowledge the importance of, and provide instruments for dealing with, three conditions for effectiveness for behaviour change methods. For a behaviour change method to be effective: (1) it must target a determinant that predicts behaviour; (2) it

### ARTICLE HISTORY

Received 24 July 2014  
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### KEYWORDS

Taxonomy; behaviour change; meta-analysis; meta-analyses; review; interventions

Sources: Michie et al. (2013). *Annals of Behavioral Medicine*.  
Kok et al. (2016). *Health Psychology Review*.

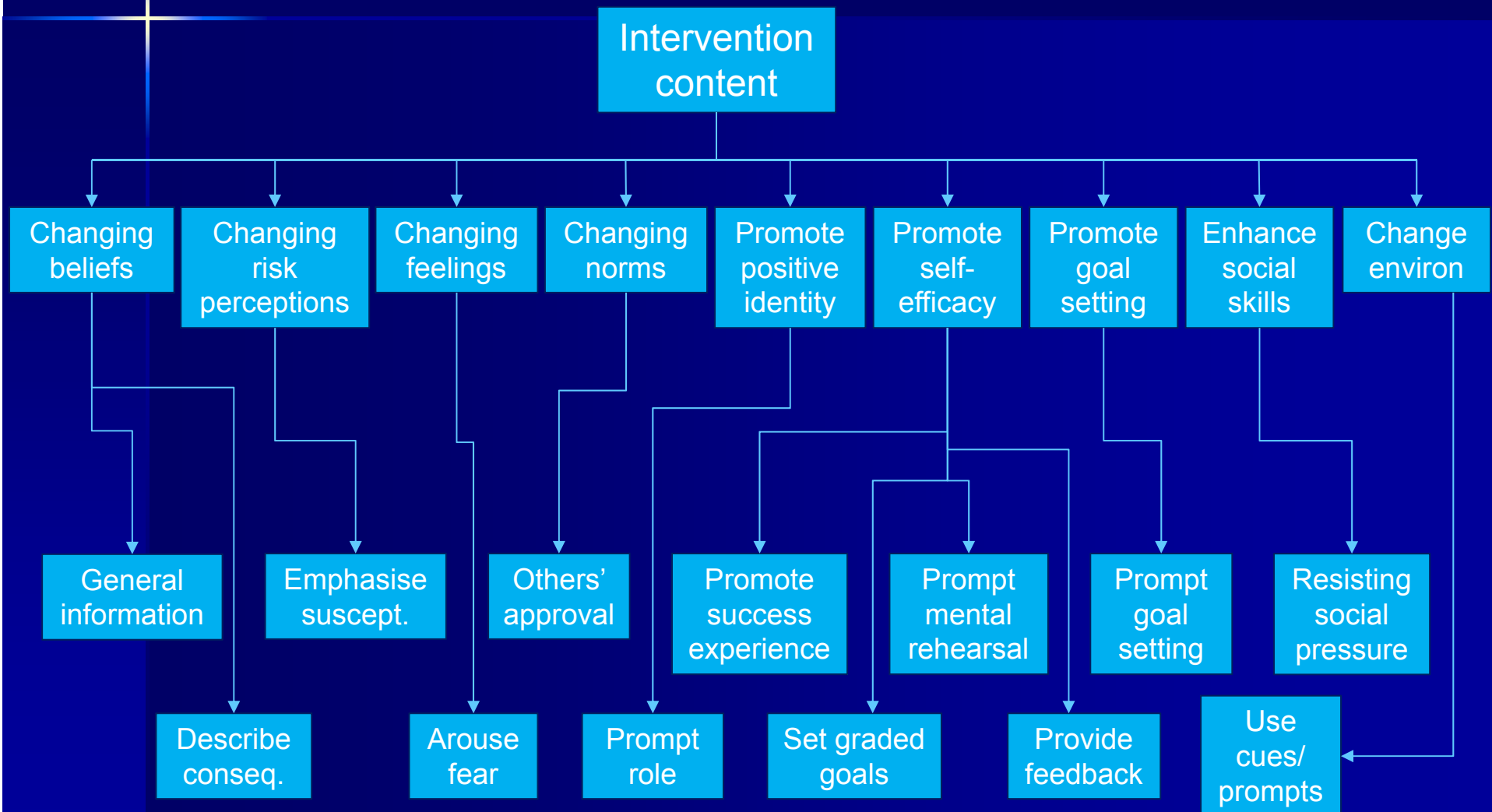


# Behaviour Change 'Taxonomy'

- Structured organisation of unique methods that make up behavioural interventions
- “The need for a common vocabulary in terms of which content components of behaviour change interventions can be defined and described”

(Abraham & Michie, 2008, p. 380)
- Analogy: “Mapping the genome” of behaviour change interventions

# 'Mapping the Genome' of Behavioural Interventions



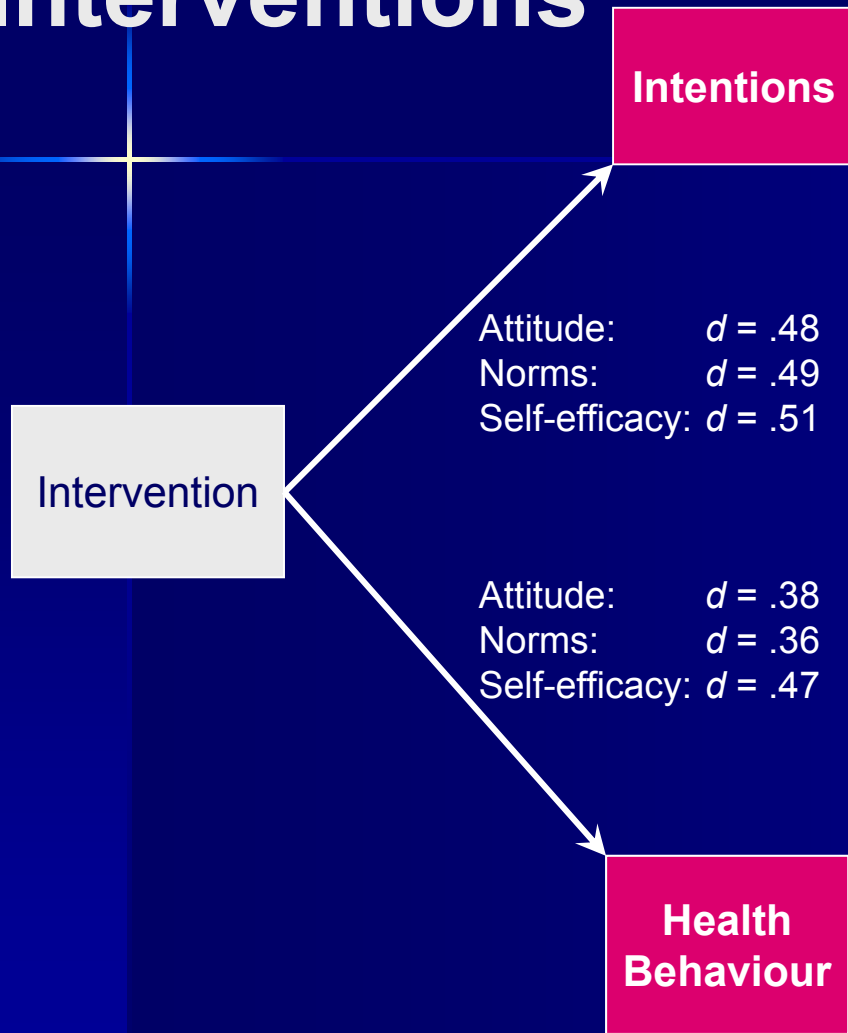
**Does using theory make an  
intervention better?**

**It depends who you ask!**

# Theory and Behavioural Interventions

- Good practice to use theory (Glanz & Rimer, 1995; Glanz & Bishop, 2010)
- Some interventions *refer* to theory... (Michie & Abraham, 2004; Noar et al., 2009)
- ...but many do not! (Albarracín et al., 2005; Davies et al., 2010)
- Some evidence that theory-based intervention are more effective... (Fisher & Fisher, 2000; Taylor et al., 2010; Webb et al., 2010)
- ...But others have indicated no difference in effectiveness or even less effectiveness! (Albarracín et al., 2005; Gardner et al., 2011; Stephenson et al., 2000)

# Theory of Planned Behaviour Interventions



Health Psychology © 2016 American Psychological Association  
0278-6133/16/\$12.00 http://dx.doi.org/10.1037/hea0000387

## The Impact of Changing Attitudes, Norms, and Self-Efficacy on Health-Related Intentions and Behavior: A Meta-Analysis

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University of North Carolina at Chapel Hill

Alexander Maki  
University of Minnesota

Erika Montanaro  
University of Colorado Boulder

Aya Avishai-Yitshak  
University of North Carolina at Chapel Hill

Angela Bryan  
University of Colorado Boulder

William M. P. Klein  
National Cancer Institute

Eleanor Miles  
University of Sussex

Alexander J. Rothman  
University of Minnesota

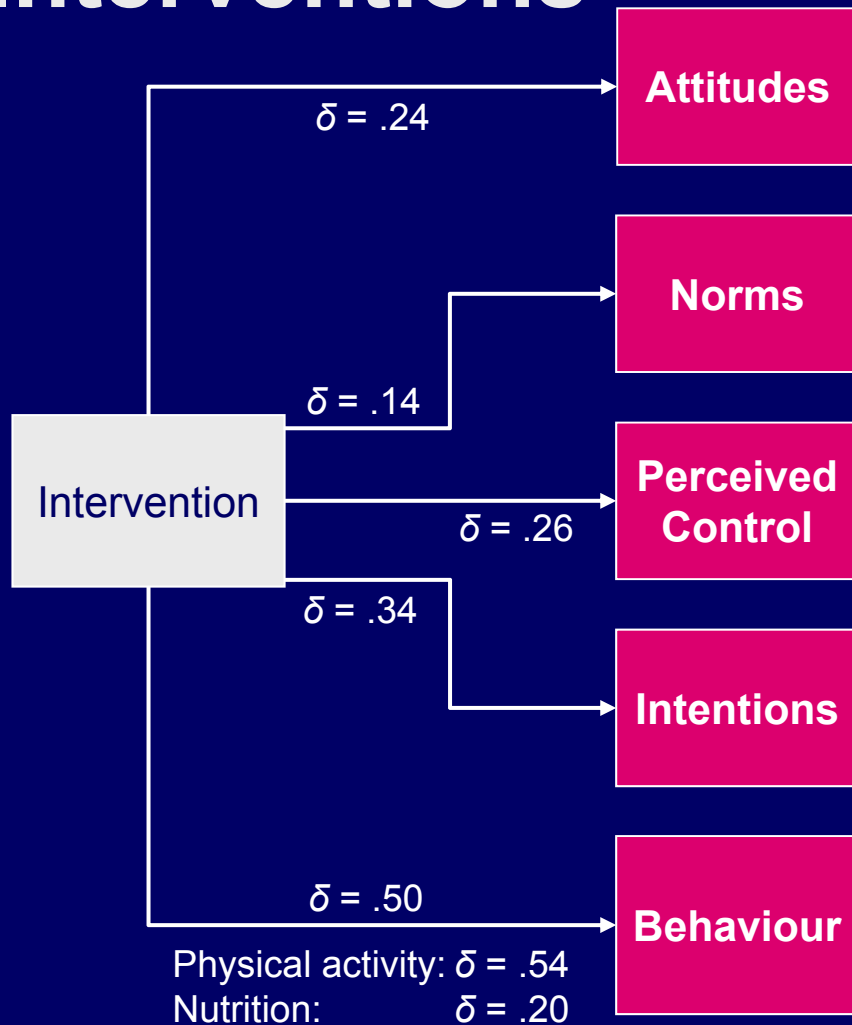
**Objective:** Several health behavior theories converge on the hypothesis that attitudes, norms, and self-efficacy are important determinants of intentions and behavior. However, inferences regarding the relation between these cognitions and intention or behavior rest largely on correlational data that preclude causal inferences. To determine whether changing attitudes, norms, or self-efficacy leads to changes in intentions and behavior, investigators need to randomly assign participants to a treatment that significantly increases the respective cognition relative to a control condition, and test for differences in subsequent intentions or behavior. The present review analyzed findings from 204 experimental tests that met these criteria. **Method:** Studies were located using computerized searches and informal sources and meta-analyzed using STATA Version 11. **Results:** Experimentally induced changes in attitudes, norms, and self-efficacy all led to medium-sized changes in intention ( $d_s = .48, .49, \text{ and } .51$ , respectively), and engendered small to medium-sized changes in behavior (attitudes- $d_s = .38$ , norms- $d_s = .36$ , self-efficacy- $d_s = .47$ ). These effect sizes generally were not qualified by the moderator variables examined (e.g., study quality, theoretical basis of the intervention, methodological characteristics, and features of the targeted behavior), although effects were larger for interventions designed to increase (vs. decrease) behavioral performance. **Conclusion:** The present review lends novel, *experimental* support for key predictions from health behavior theories, and demonstrates that interventions that modify attitudes, norms, and self-efficacy are effective in promoting health behavior change.

**Keywords:** health behavior, interventions, attitude, norm, self-efficacy

**Supplemental materials:** <http://dx.doi.org/10.1037/hea0000387.supp>

Source: Sheeran et al. (2016) *Health Psychology*, 35, 1178-1188

# Theory of Planned Behaviour Interventions



Review Article



## How Effective are Behavior Change Interventions Based on the Theory of Planned Behavior?

A Three-Level Meta-Analysis

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**Abstract:** The theory of planned behavior (TPB) is a prominent framework for predicting and explaining behavior in a variety of domains. The theory is also increasingly being used as a framework for conducting behavior change interventions. In this meta-analysis, we identified 82 papers reporting results of 123 interventions in a variety of disciplines. Our analysis confirmed the effectiveness of TPB-based interventions, with a mean effect size of .50 for changes in behavior and effect sizes ranging from .14 to .68 for changes in antecedent variables (behavioral, normative, and control beliefs, attitude, subjective norm, perceived behavioral control, and intention). Further analyses revealed that the interventions' effectiveness varied for the diverse behavior change methods. In addition, interventions conducted in public and with groups were more successful than interventions in private locations or focusing on individuals. Finally, we identified gender and education as well as behavioral domain as moderators of the interventions' effectiveness.

**Keywords:** intervention, theory of planned behavior, meta-analysis, multilevel, three-level meta-analysis

Source: Steinmetz et al. (2016). How effective are behavior change interventions based on the Theory of Planned Behavior? *Zeitschrift Fur Psychologie*.

# Methods Used to Change Behaviour in Theory-Based Interventions

Behaviour change method	Frequency
Information	47
Increasing skills	43
Persuasion	38
Planning	33
Social encouragement	20
Goal setting	19
Motivation	18
Self-monitoring	12

Source: Steinmetz et al. (2016). How effective are behavior change interventions based on the Theory of Planned Behavior? *Zeitschrift Fur Psychologie*.

# Theory and Behavioural Interventions

Health Psychology  
2014, Vol. 33, No. 5, 465–474

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0278-6133/14/\$12.00 <http://dx.doi.org/10.1037/a0032853>

## Does Theory Influence the Effectiveness of Health Behavior Interventions? Meta-Analysis

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*Objective:* To systematically investigate the extent and type of theory use in physical activity and dietary interventions, as well as associations between extent and type of theory use with intervention effectiveness.

*Methods:* An in-depth analysis of studies included in two systematic reviews of physical activity and healthy eating interventions ( $k = 190$ ). Extent and type of theory use was assessed using the Theory Coding Scheme (TCS) and intervention effectiveness was calculated using Hedges's  $g$ . Metaregressions assessed the relationships between these measures. *Results:* Fifty-six percent of interventions reported a theory base. Of these, 90% did not report links between all of their behavior change techniques (BCTs) with specific theoretical constructs and 91% did not report links between all the specified constructs with BCTs. The associations between a composite score or specific items on the TCS and intervention effectiveness were inconsistent. Interventions based on Social Cognitive Theory or the Transtheoretical Model were similarly effective and no more effective than interventions not reporting a theory base. *Conclusions:* The coding of theory in these studies suggested that theory was not often used extensively in the development of interventions. Moreover, the relationships between type of theory used and the extent of theory use with effectiveness were generally weak. The findings suggest that attempts to apply the two theories commonly used in this review more extensively are unlikely to increase intervention effectiveness.

Prestwich et al. (2014). Does theory influence the effectiveness of health behavior interventions? Meta-analysis. *Health Psychology*



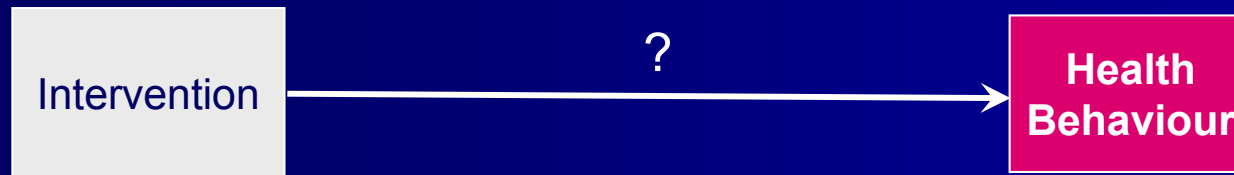
# Theory and Behavioural Interventions

- Meta-analysis of health behaviour interventions (Prestwich et al., 2014)
- Theoretical basis reported: 56%
- Reported clear links between theoretical constructs and content: 10%
- Interventions based on two prominent theories:
  - Social cognitive theory (Bandura, 1986)
  - Transtheoretical model (Prochaska & Diclemente, 1982)
- Were no more effective than those that were not based on theory
- No overall association between theory use and intervention effectiveness

# Methods Used to Change Behaviour in Theory-Based Interventions

N = 37 BCMs, no effect, PA & health eating (McDermott et al., 2016, *Br. J. Health Psychol.*)

N = 5 BCMs, no effect, CHD patients (Goodwin et al., 2016, *PLoS ONE*)



N = 7 BCMs (meta-review), +ive effect for use skills, negotiation skills, and cognitive behavioural skills, HIV-prevention (Protogerou & Johnson, 2014, *AIDS & Behav.*)

N = 7.64 unique BCMs, +effect for no. of unique BCMs, PA for musculoskeletal pain (Bishop et al., 2015, *Psychol. Health*)

N = Interventions using more BCMs had stronger effects, internet-based interventions (Webb, 2012, *JMIR*)

# Accumulating Evidence for Behaviour Change Interventions

*Health Psychology Review*, 2015  
Vol. 9, No. 1, 1–14, <http://dx.doi.org/10.1080/17437199.2013.848409>



## **Everything should be as simple as possible, but no simpler: towards a protocol for accumulating evidence regarding the active content of health behaviour change interventions**

Gjalt-Jorn Ygram Peters<sup>a,b\*</sup>, Marijn de Bruin<sup>c,1</sup> and Rik Crutzen<sup>d</sup>

<sup>a</sup>*Department of Methodology & Statistics, Faculty of Psychology, Open University, Heerlen, The Netherlands;* <sup>b</sup>*Department of Work & Social Psychology, Faculty of Psychology, Maastricht University, Maastricht, The Netherlands;* <sup>c</sup>*Amsterdam School of Communication Research, Faculty of Society and Behavioural Sciences, University of Amsterdam, Amsterdam, The Netherlands;* <sup>d</sup>*Department of Health Promotion, CAPHRI, Maastricht University, Maastricht, The Netherlands*

*(Received 2 May 2013; final version received 22 September 2013)*

There is a need to consolidate the evidence base underlying our toolbox of methods of behaviour change. Recent efforts to this effect have conducted meta-regressions on evaluations of behaviour change interventions, deriving each method's effectiveness from its association to intervention effect size. However, there are a range of issues that raise concern about whether this approach is actually furthering or instead obstructing the advancement of health psychology theories and the quality of health behaviour change interventions. Using examples from theory, the literature and data from previous meta-analyses, these concerns and their implications are explained and illustrated. An iterative protocol for evidence base accumulation is proposed that integrates evidence derived from both experimental and applied behaviour change research, and combines theory development in experimental settings with theory testing in applied real-life settings. As evidence gathered in this manner accumulates, a cumulative science of behaviour change can develop.

**Keywords:** behaviour change; interventions; methods; techniques; taxonomy; evidence base

Source: Peters, de Bruin & Crutzen. (2015). *Health Psychology Review*.

# Theory and Behavioural Interventions

- Meta-analyses of research BCMs are problematic
- Most interventions use multiple BCMs
- Poor reporting present challenges in coding
- Coding typically reflects 'presence' vs. 'absence'
- Interactions and confounds
- Number of 'parameters for effectiveness' not accounted for
- Need for more accurate reporting and coding
- Need for more experimental evidence using factorial designs

# Limitations

# Examples of Theories

- Self-efficacy/social cognitive theory (Bandura, 1963)
- Health belief model (Becker, 1974)
- Protection motivation theory (Rogers, 1975)
- Theory of interpersonal behaviour (1977)
- Theory of reasoned action (Fishbein & Ajzen, 1980)
- Self-determination theory (Deci, 1980)
- Transtheoretical model (Prochaska & DiClemente, 1982)
- Personality systems interaction theory (Kuhl, 1984)
- Theory of planned behaviour (Ajzen, 1985)
- Self-regulation theory (Bagozzi, 1990)
- Health action process approach (Schwarzer, 1992)
- The I-change model (De Vries et al., 1998)
- Reasoned action approach (Fishbein & Azjen, 2009)

# Considerable Redundancy

Psychological Bulletin  
1995, Vol. 117, No. 2, 187-215

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0033-2909/95/\$3.00

## A Contrarian View of the Five-Factor Approach to Personality Description

Jack Block  
University of California, Berkeley

The 5-factor approach (FFA) to personality description has been represented as a comprehensive and compelling rubric for assessment and analysis. The algorithmic method of factor discovery of the five factors may be flawed. Lexical analyses are based on special merits and sufficiencies of the 5 factors and have achieved uncertain results. The special merits and sufficiencies of the 5 factors regard to the claimed 5-factor structure of personality are drawn.

During the last decade, the "Big-Five" approach has to loom large in the field of personality psychology. I said that "rapid progress has been made toward a common personality structure" (Costa & McCrae, 1992d, Goldberg (1992) has talked of "a quiet revolution in personality psychology. . . . An age-old scientific problem recently begun to look tractable. . . . Gradually, agreement has been growing about the number of orthogonal factors to account for the interrelations among English-language descriptors" (p. 26). The contention is that, via the method of factor analysis, the basic dimensions of personality description have been "discovered": "Their nature and their nature can be summarized by the broad categories: Surgency, Agreeableness, Conscientiousness, Emotionality versus Neuroticism, and Openness to Experiences"

frontiers in  
**PSYCHOLOGY**

GENERAL COMMENTARY

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## Avoiding the "déjà-variable" phenomenon: social psychology needs more guides to constructs

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\*Correspondence: martin.hagger@curtin.edu.au

Edited by:

John M. Zelenski, Carleton University, Canada

Keywords: constructs, integrative frameworks, research synthesis, social psychology

A commentary on

A guide to constructs of control  
by Skinner, E. A. (1996). *J. Pers. Soc. Psychol.* 71, 549-570. doi: 10.1037/0022-3514.71.3.549

As a journal editor, I am frequently asked what constitutes an exceptional research article (Hagger, 2012). I usually respond by recommending Skinner's (1996) seminal guide to constructs of control as a prototypical example. When I was a doctoral student Skinner's article was extremely influential to my work. It not only helped me make sense of the myriad of constructs and terms used to describe and define the control construct, but also how I approached other constructs in social

of things to compare many syntheses somewhat prematurely and systematically identified and diversity in (Hagger and Chaffin) that social psychology frameworks consistency in the content of social psychology. This will assist and integrate research involving social psychology. There have been many felt confronted of déjà-vu when reading the psychologists' description developed. I call the déjà-variable phenomenon; the

## PERSONALITY PROCESSES AND INDIVIDUAL DIFFERENCES

### A Guide to Constructs of Control

Ellen A. Skinner  
Portland State University

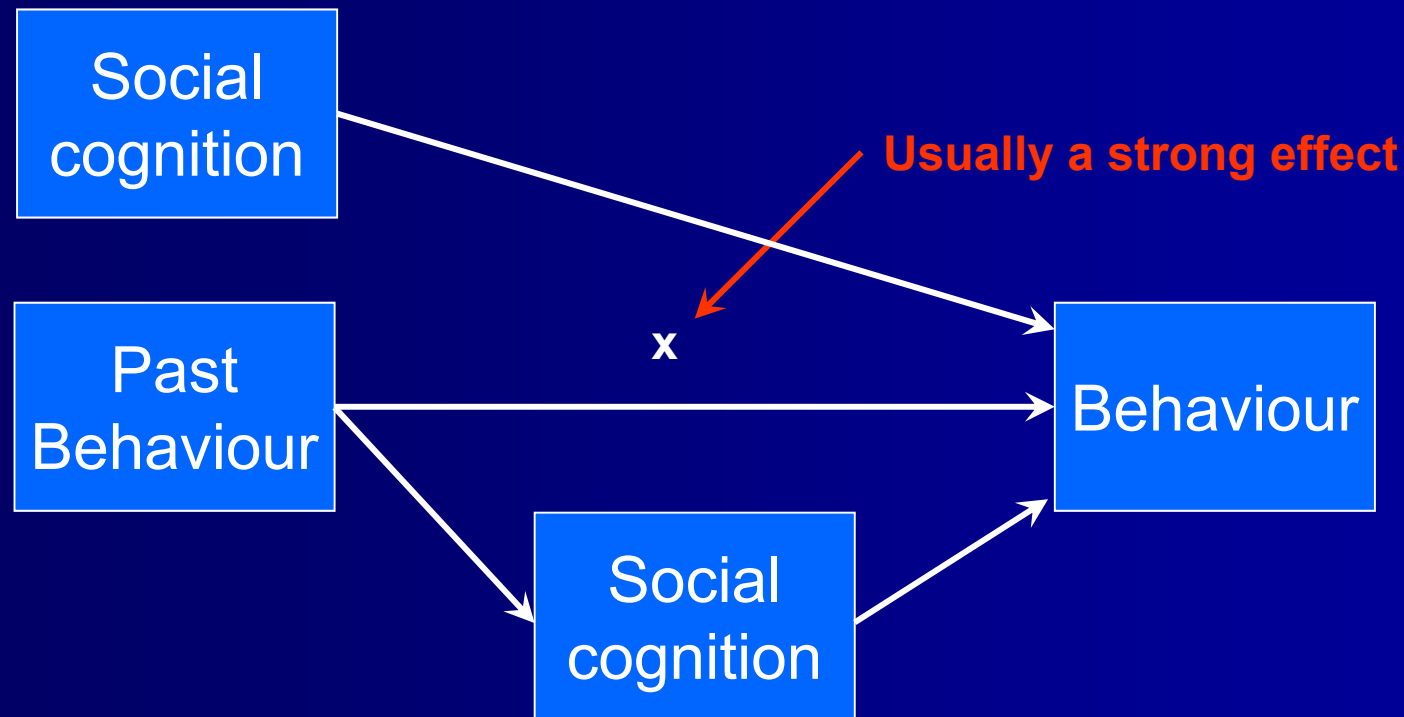
An integrative framework, designed to organize the heterogeneous constructs related to "control", is based on 2 fundamental distinctions: (a) objective, subjective, and experiences of control; and (b) agents, means, and ends of control. The framework is used to analyze more than 100 terms, such as *sense of control, proxy control, and primary control*. It is argued that although many terms reflect aspects of perceived control (both distinct and overlapping), some are more usefully considered aspects of objective control conditions (e.g., contingency), potential antecedents of perceived control (e.g., choice), potential consequences (e.g., secondary control), sources of motivation for control (e.g., mastery), or other sources of motivation (e.g., autonomy). Implications for theory, measurement, research, and intervention are explored.

Control is important to psychological functioning. Decades of research in sociology and psychology have demonstrated that a sense of control is a robust predictor of physical and mental well-being (M. M. Baltes & Baltes, 1986; Bandura, 1989; Brim, 1974; Fiske & Taylor, 1991; Gurin & Brim, 1984; Lachman & Burack, 1993; Lefcourt, 1981, 1982, 1983; Rodin, 1986; Strickland, 1989; Thompson & Spacapan, 1991) and perhaps even longevity (Langer & Rodin, 1976; Seligman, 1975). Both experimental and correlational studies have shown that across the life span, from earliest infancy to oldest age, individual differences in perceived control are related to a variety of posi-

Langer, 1980; Rodin, 1990; Thompson & Spacapan, 1991). One set of these constructs is based on the term control and includes, for example, *personal control, sense of control, locus of control, cognitive control, agenda control, vicarious control, illusory control, outcome control, primary control, secondary control, action control, decisional control, predictive control, informational control, and proxy control*. The other set of constructs does not explicitly use the word control but nevertheless seems closely related, if not identical, to the set that does; these include *helplessness, efficacy, agency, capacity, mastery,*

Sources: Block (1995) *Psychol. Bull.*  
Hagger (2014). *Front. Psychol.*  
Skinner (1996). *J. Pers. Soc. Psychol.*

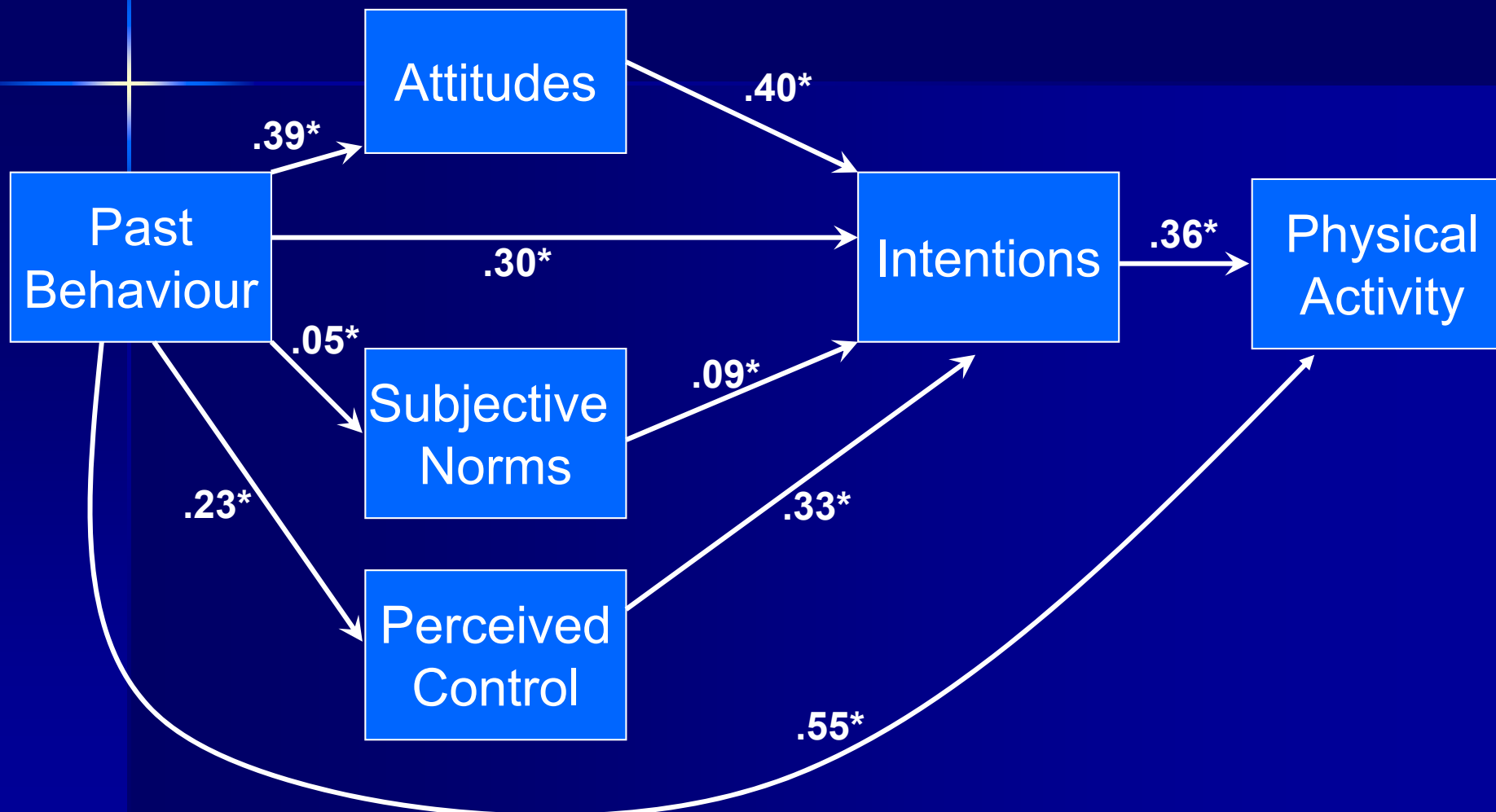
# Pervasive Effect of Past Behaviour



c.f. Oullette & Wood (1998)  
Verplanken & Orbell (2003)  
Gardner (2015)  
Hagger, Rebar, Mullan, Lipp & Chatzisarantis (2015)

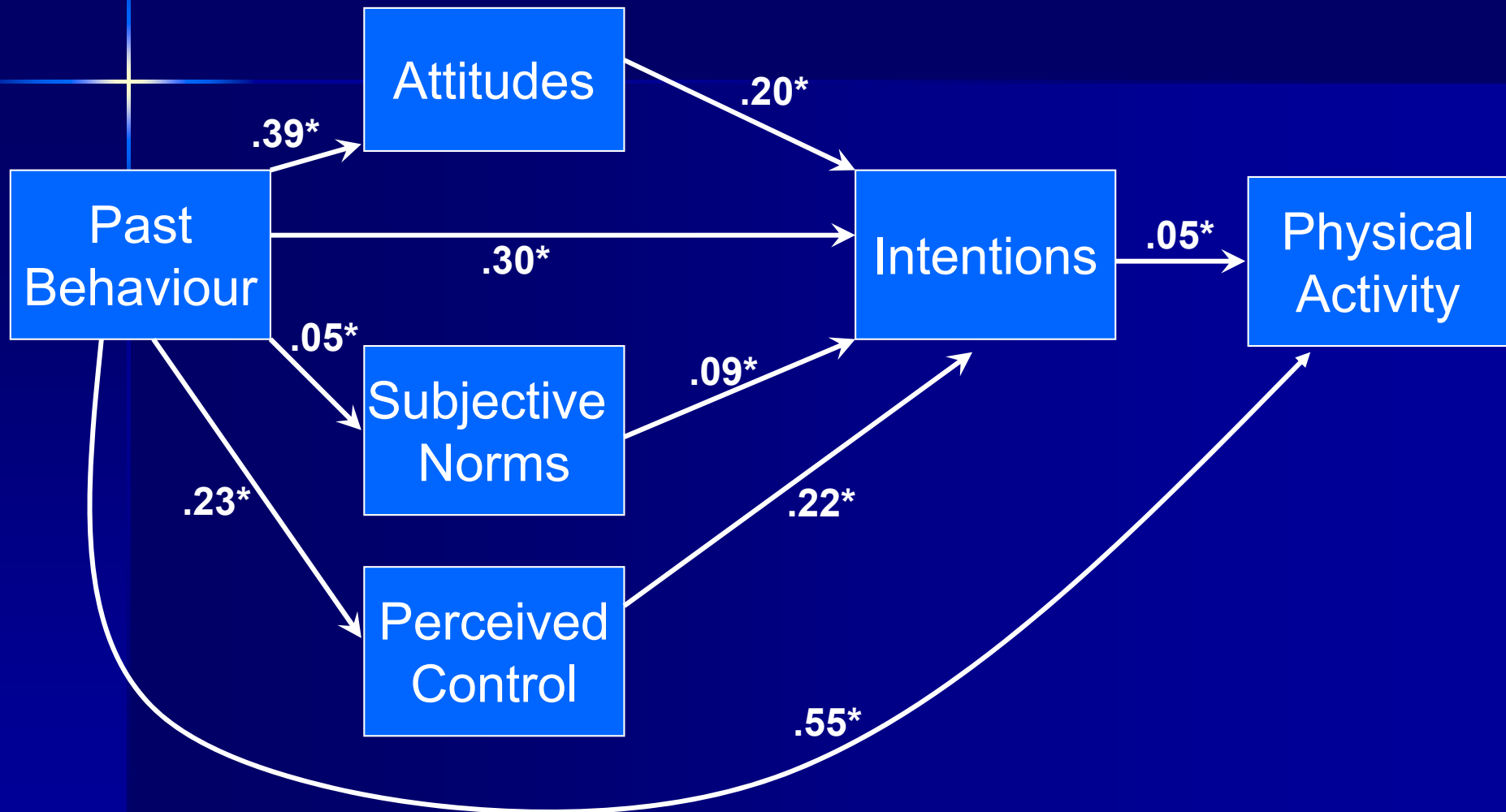


# Effects of Past Behaviour



Source: Hagger et al. (2002). *J. Sport Exerc. Psychol.*  
Hagger, Chan, Protogerou, & Chatzisarantis (2016). *Prev. Med.*

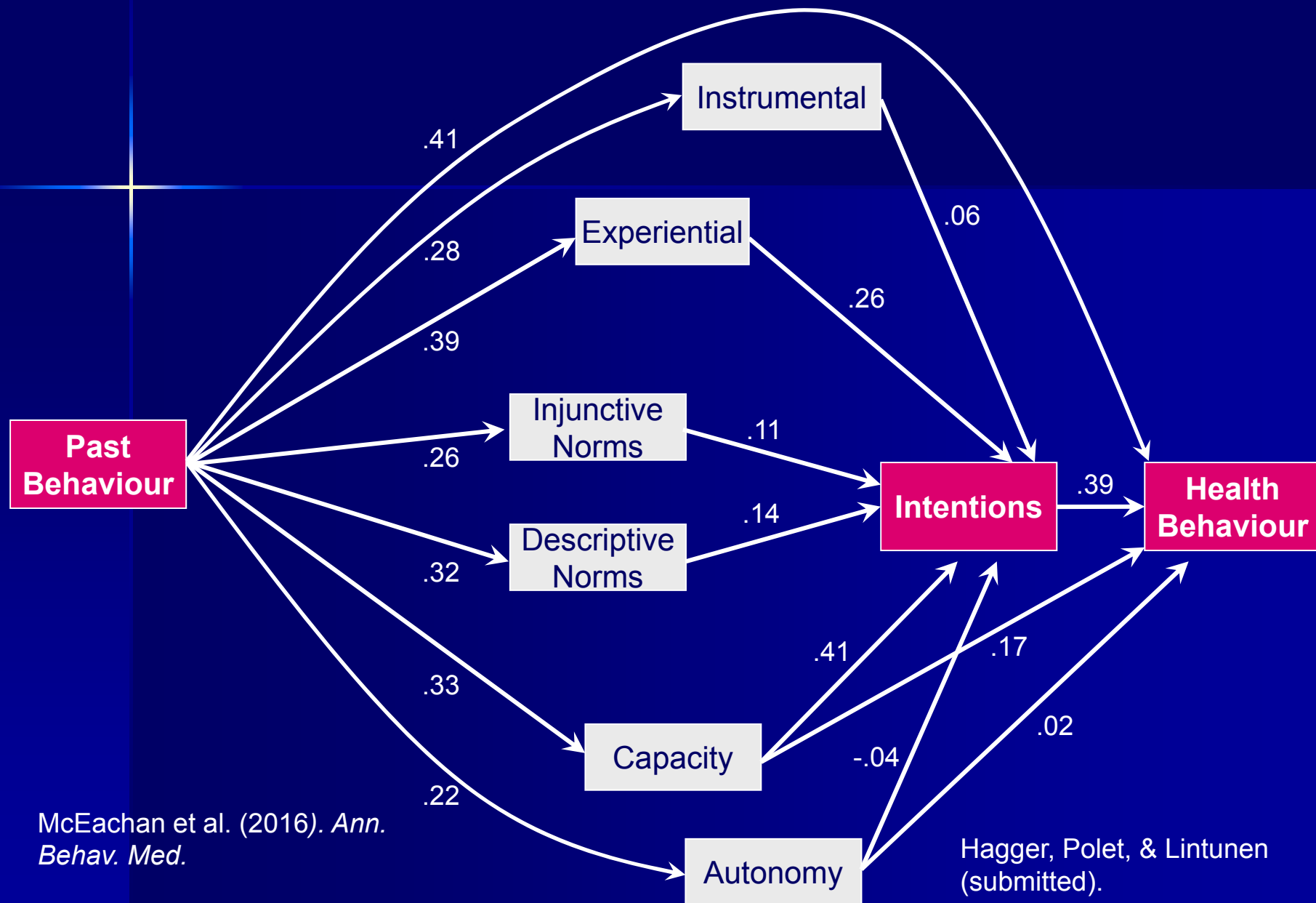
# Effects of Past Behaviour



Source: Hagger et al. (2002). *J. Sport Exerc. Psychol.*

Hagger, Chan, Protogerou, & Chatzisarantis (2016). *Prev. Med.*

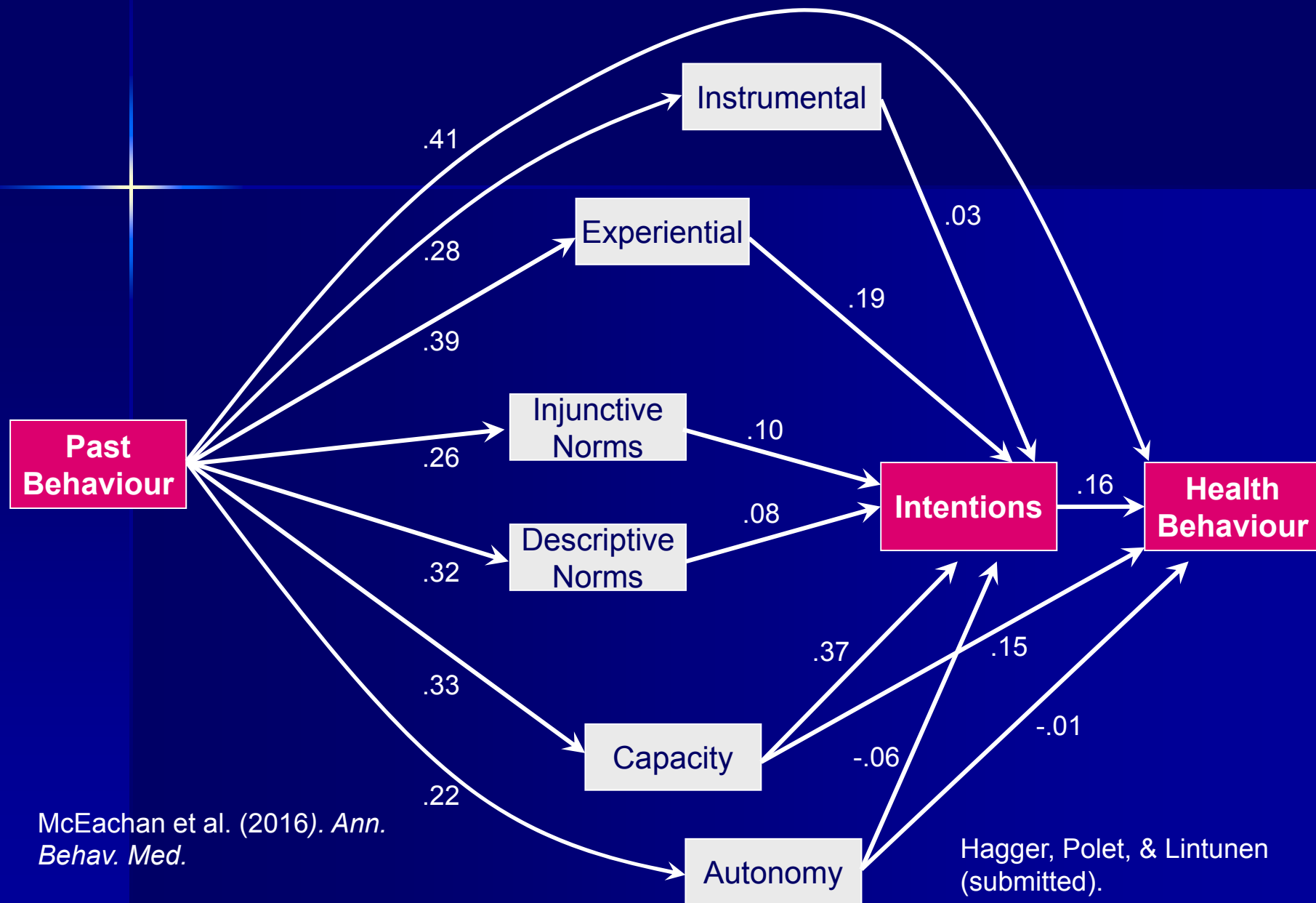
# The Reasoned Action Approach



McEachan et al. (2016). *Ann. Behav. Med.*

Hagger, Polet, & Lintunen (submitted).

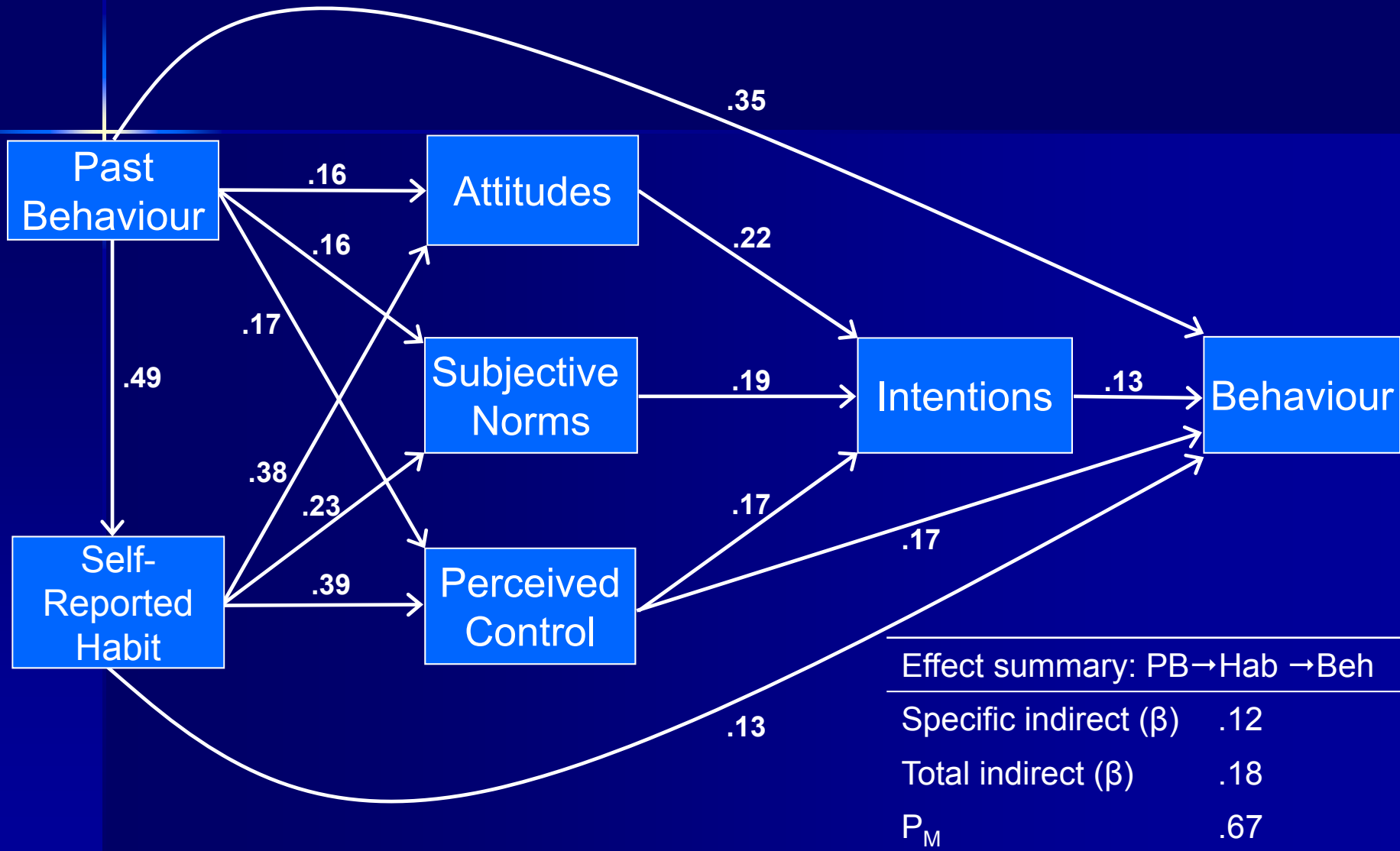
# The Reasoned Action Approach



# Past Behaviour, Habit, and Explaining Behaviour Change

- What does the past-future behaviour effect represent?
  - Unmeasured variables
  - Habit as a 'construct'
  - Implicit effects that occur beyond an individual's awareness

# Habit and Past Behaviour



Source: Hagger, Protogerou, Mallia, Girelli, Zhang & Lucidi (in preparation).

# Intention-Behaviour Relations

## Motivation is not enough

- Motivation may be a necessary but not sufficient condition for behaviour
- Many people state an intention, motive or desire to participate in a health behaviour....  
....but fail miserably to do so!

- Intention-behaviour 'gap' **Imperfect!**



# Inclined Abstainers

## Unsuccessful intenders

British Journal of Health Psychology (2013), 18, 296–309  
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### How big is the physical activity intention–behaviour gap? A meta-analysis using the action control framework

Ryan E. Rhodes<sup>1\*</sup> and Gert-Jan de Bruijn<sup>2</sup>

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<sup>2</sup>University of Amsterdam, the Netherlands

**Objectives.** The physical activity (PA) intention–behaviour gap is a topic of considerable contemporary research, given that most of our models used to understand physical activity suggest that intention is the proximal antecedent of behavioural enactment. The purpose of this study was to quantify the intention–PA gap at public health guidelines using a meta-analysis of the action control framework.

**Design.** Systematic review and meta-analysis.

**Methods.** Literature searches were conducted in July 2012 among five key search engines. This search yielded a total of 2,865 potentially relevant records; of these

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### ‘Inclined abstainers’: A problem for predicting health-related behaviour

Sheina Orbell\* and Paschal Sheeran

*Department of Psychology, University of Sheffield, Sheffield S10 2UR, UK*

A longitudinal test of the association between motivation to undertake a precautionary health action and subsequent behaviour was conducted on women’s uptake of the cervical screening test. A sample of never-screened women ( $N = 166$ ) completed measures derived from protection-motivation theory (PMT; Rogers, 1983). One year later, screening uptake was reliably determined from medical records. While regression analyses demonstrated that PMT variables predicted both motivation to undergo cervical screening and screening uptake, there was, nonetheless, a good deal of inconsistency between protection motivation and screening behaviour. Fifty-seven per cent of those who indicated they were willing to undergo the test did not do so within a one-year period. Discriminant analysis



# Inclined Abstainers

## Unsuccessful intenders

### Physical Activity Behaviour

		Physical Activity Behaviour	
		Successful	Unsuccessful
Intention	Intender	Successful Intenders (42%)	Unsuccessful Intenders (36%)
	Non-intender	Successful Non-intenders (2%)	Unsuccessful Non-intenders (21%)

Source: Rhodes & de Bruin (2013) *Br. J. Health Psychol.*

# Solutions

# Theory Integration

Journal of Applied Social Psychology  
*Explore this journal >*

**Application of an Integrated Behavioral Model to Predict Condom Use: A Prospective Study Among High HIV Risk Groups<sup>1</sup>**

Danuta Kasprzyk , Daniel E. Montaño, MARTIN FISHBEIN

First published: September 1998 [Full publication history](#)

DOI: 10.1111/j.1559-1816.1998.tb01690.x [View/save citation](#)

Cited by: 38 articles [Citation tools](#)



<sup>1</sup>This research was funded by National Institute of Mental Health Grant R01 MH47059. Any research endeavor is usually the result of tremendous effort and extraordinary teamwork. We would like to acknowledge the teamwork of our staff that was crucial to the success of this project. In addition, we thank our participants for so freely sharing their lives with us. Without all of you, this project could not have been.


 Correspondence concerning this article should be addressed to Danuta Kasprzyk, Battelle, Centers for Public Health Research and Evaluation, 4000 N. E. 41st Street, Seattle, WA 98105-5428

**Abstract**

An integrated theoretical model using constructs from multiple behavioral models understand and predict condom use among a sample of injecting drug users, commercial sex workers, men who have sex with men, and multipartnered heterosexuals. Elicitation interviews were conducted to develop a questionnaire to measure model constructs that may predict condom use for sex with vaginal, anal, and oral regular and casual partners. A prospective survey design was used, with 993 participants interviewed at Time 1, and 686 return interviews 3 months later. Regression analyses were conducted using Time 1 measures to predict Time 2 intention and Time 2 behavior. Strong support was found for a model that included social norm, and facilitators/constraints as predictors of behavior, with multiple coefficients in the 0.20 to 0.40 range. Findings also indicate perceived control and facilitators/constraints as distinct constructs and both, along with attitude and social norm, contribute to explain behavioral intention. Implications for intervention development are discussed.

Kasprzyk, D., Montaño, D. E., & Fishbein, M. (1998). *J. Appl. Soc. Psychol.*

de Vries, H., Mesters, I., van de Steeg, H., & Honing, C. (2005). *Patient Educ. Counsel.*

  
ELSEVIER

Patient Education and Counseling 56 (2005) 154–165  
[www.elsevier.com/locate/pateducou](http://www.elsevier.com/locate/pateducou)

**Patient Education and Counseling**

**The general public's information needs and perceptions regarding hereditary cancer: an application of the Integrated Change Model**

Hein de Vries<sup>a,\*</sup>, Ilse Mesters<sup>a</sup>, Hermanna van de Steeg<sup>b</sup>, Cora Honing<sup>b</sup>

<sup>a</sup> Department of Health Education, Maastricht University, P.O. Box 616, 6200 MD Maastricht, The Netherlands  
<sup>b</sup> Department of Information and Support, Dutch Cancer Society, Amsterdam, The Netherlands

Received 20 February 2003; received in revised form 25 July 2003; accepted 25 January 2004

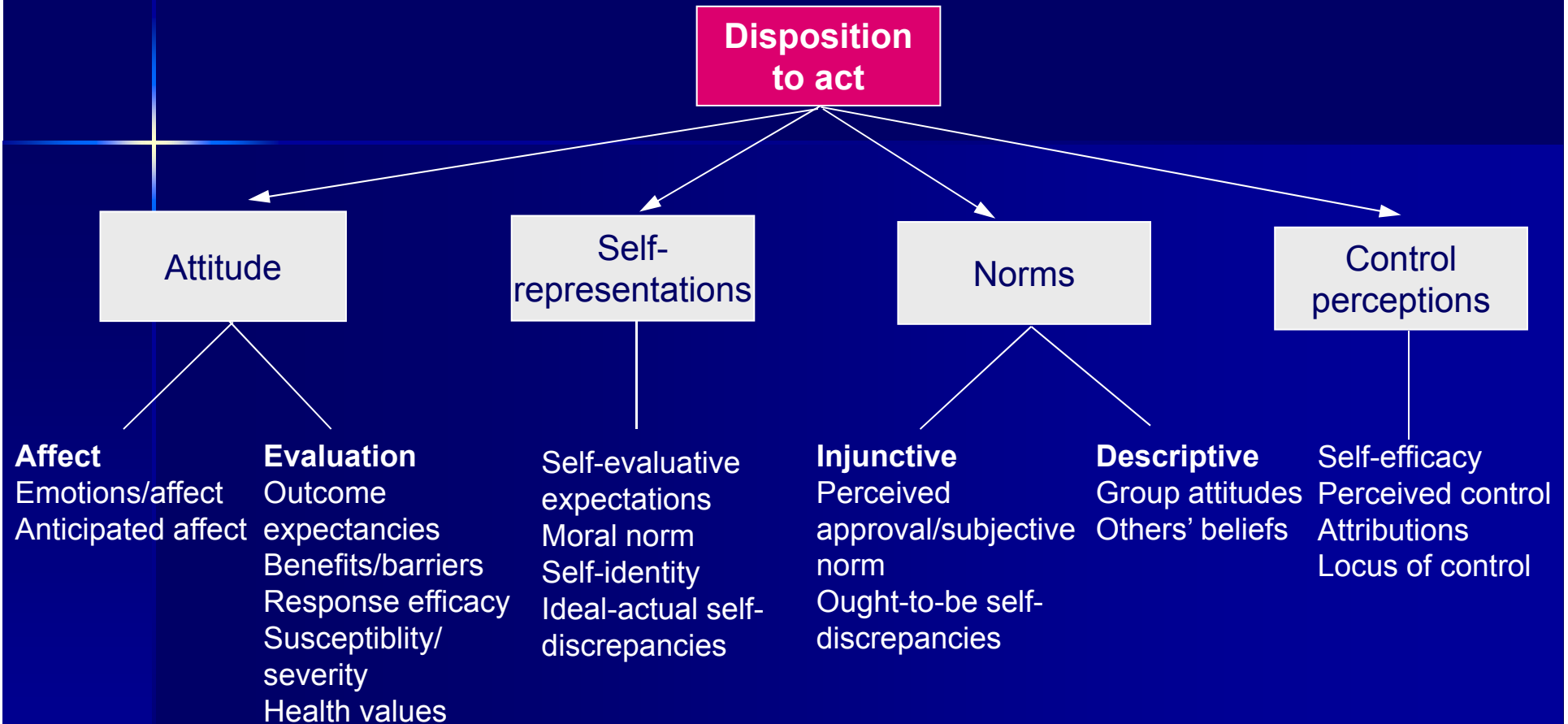
**Abstract**

The Integrated Change Model (the I-Change Model) was used to analyse the general public's need and perceptions concerning receiving information on the role of hereditary factors with regard to cancer. The results from a study in 457 Dutch adults showed that 25% correctly indicated the types of cancer where hereditary factors can play a role. Respondents, however, overestimated the role of hereditary factors causing breast cancer. Recognition of warning signs was low, as was the recognition of inheritance patterns. Participants wanted to know the types of cancer with hereditary aspects, how to recognise hereditary cancer in the family, personal risks and the steps to be taken when hereditary predisposition is suspected. The most popular information channels mentioned were leaflets, the general practitioner, and the Internet. Respondents interested in receiving information on heredity and cancer were more often female, had had experiences with hereditary diseases, had more knowledge, perceived more advantages, encountered more social support in seeking information, and had higher levels of self-efficacy. Education should outline the most important facts about hereditary cancer, how to get support, and create realistic expectations of the impact of genetic factors.

© 2004 Published by Elsevier Ireland Ltd.

**Keywords:** Hereditary cancer; Knowledge; Attitudes; Self-efficacy; Integrated Change Model

# Core Health Cognitions



Source: McMillan & Conner (2007). Health cognition assessment. In A. B. S. Ayers et al. (Eds.), *Cambridge Handbook of Psychology, Health and Medicine*. Cambridge, UK: Cambridge University Press.

## ARTICLE

# An Integrated Behavior Change Model for Physical Activity

Martin S. Hagger and Nikos L.D. Chatzisarantis

Health Psychology and Behavioral Medicine Research Group, School of Health Sciences, Curtin University, Perth, Australia

HAGGER, M.S. and N.L.D. CHATZISARANTIS. An integrated behavior change model for physical activity. *Exercise and Sport Sciences Reviews*, Vol. 42, No. 2, pp. 62–69, 2014. We present the Integrated Behavior Change Model, a theoretical approach from an array of theories and models developed in the field of social psychology (13). The purpose of adopting any theory or model is to identify effectively and parsimoniously the important psychological factors associated with physical activity behavior and the processes by which these factors affect physical activity (14,30). Although many psychological theories applied to physical activity contexts

## INTRODUCTION

Research examining the psychological influences on health-related physical activity behavior typically has adopted a single theoretical approach from an array of theories and models developed in the field of social psychology (13). The purpose of adopting any theory or model is to identify effectively and parsimoniously the important psychological factors associated with physical activity behavior and the processes by which these factors affect physical activity (14,30). Although many psychological theories applied to physical activity contexts

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Australian Journal  
of Psychology

Australian Journal of Psychology 2017; 69: 130–148  
doi: 10.1111/ajpy.12127



## Developing an integrated theoretical model of young peoples' condom use in sub-Saharan Africa

Cleo Protogerou<sup>1,2</sup> and Martin S. Hagger<sup>2,3,4,5</sup>

<sup>1</sup>Department of Psychology, University of Cape Town, Rondebosch, South Africa, <sup>2</sup>Health Psychology and Behavioural Medicine Research Group, School of Psychology and Speech Pathology, Faculty of Health Sciences, Curtin University, Perth, Western Australia, <sup>3</sup>Faculty of Sport and Health Sciences, University of Jyväskylä, Jyväskylä, Finland, <sup>4</sup>School of Applied Psychology and Menzies Health Institute, Griffith University, Mt Gravatt, Brisbane and <sup>5</sup>School of Human, Health, and Social Sciences, Central Queensland University, Rockhampton, Queensland, Australia

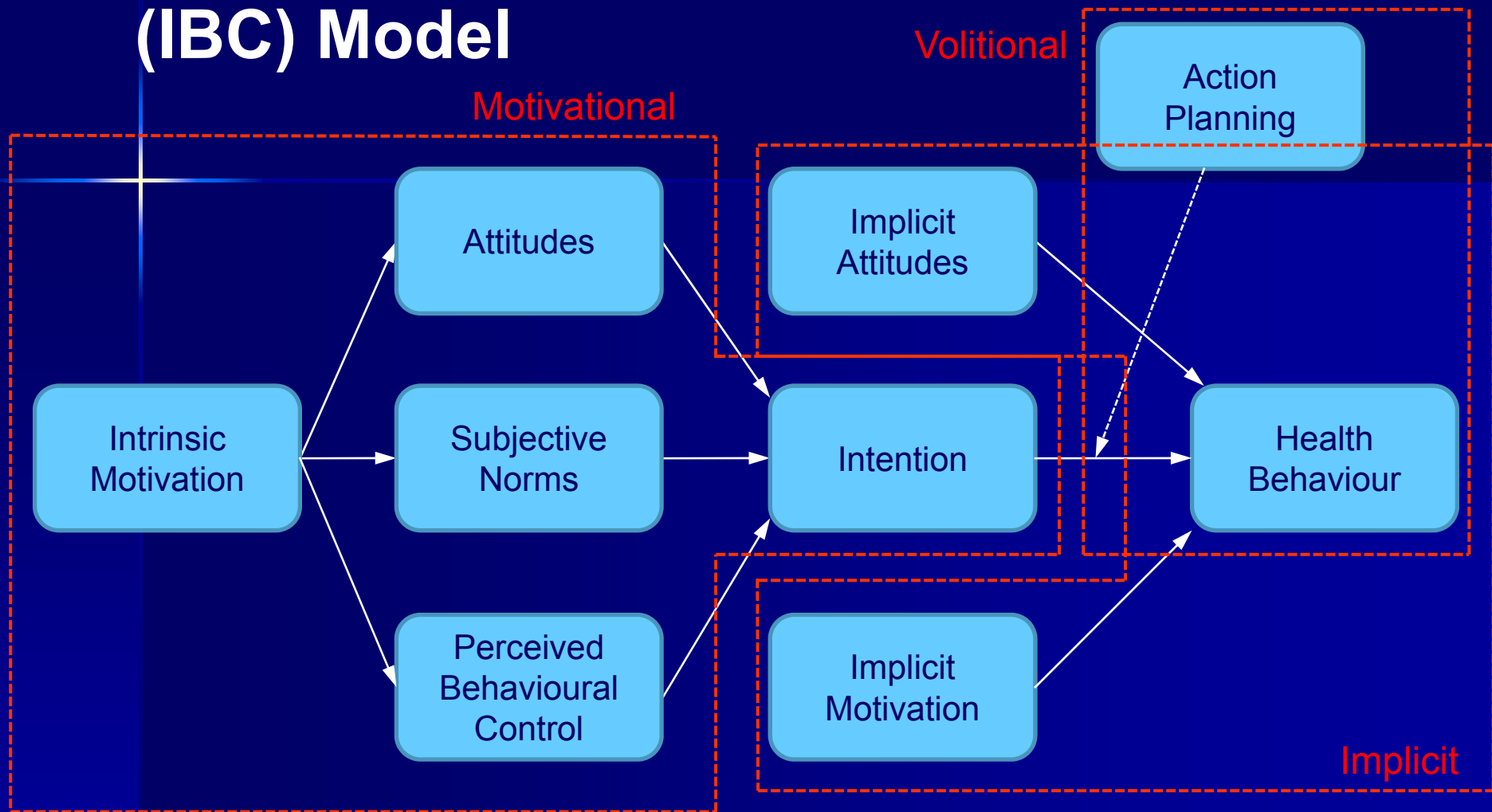
## Abstract

**Objective:** We aimed to develop an integrated theoretical model of the determinants of condom use in young people from sub-Saharan African (SSA) nations. Model development was informed by research predicting condom use in SSA nations adopting individual-level social-cognitive and socio-ecological theories, and guided by McMillan and Conner's (2007) framework of social-cognitive predictors of health. **Method:** We conducted a scoping review of research on social-cognitive and socio-ecological predictors of condom use in young people in SSA. The integrated model was developed based on the constructs from the review and guided by McMillan and Conner's framework to classify the constructs and isolate the processes by which the constructs impact condom use. **Results:** Included studies ( $N = 45$ ) utilised constructs from seven individual-level social-cognitive theories and included multiple socio-ecological variables as predictors of condom use. The integrated model included dispositions to act as a proximal determinant of condom use which mediated the effect of four categories of social-cognitive constructs on condom use: attitudes, control perceptions, norms, and self-representations. Socio-ecological factors were classified into four categories: relational, individual differences, societal/structural, and community and peer influences. Each had direct and indirect effects on condom use in the model, reflecting the non-conscious and conscious pathways to action, respectively. **Conclusion:** We expect our integrated model to provide an evidence- and theory-based guide to future research examining the antecedents of condom use in young people in SSA. We also anticipate it will assist in developing targets for interventions that will be effective in promoting condom use in this population.

**Key words:** HIV prevention, social-cognitive theories, socio-ecological model, sub-Saharan Africa, theoretical integration, theory of planned behaviour

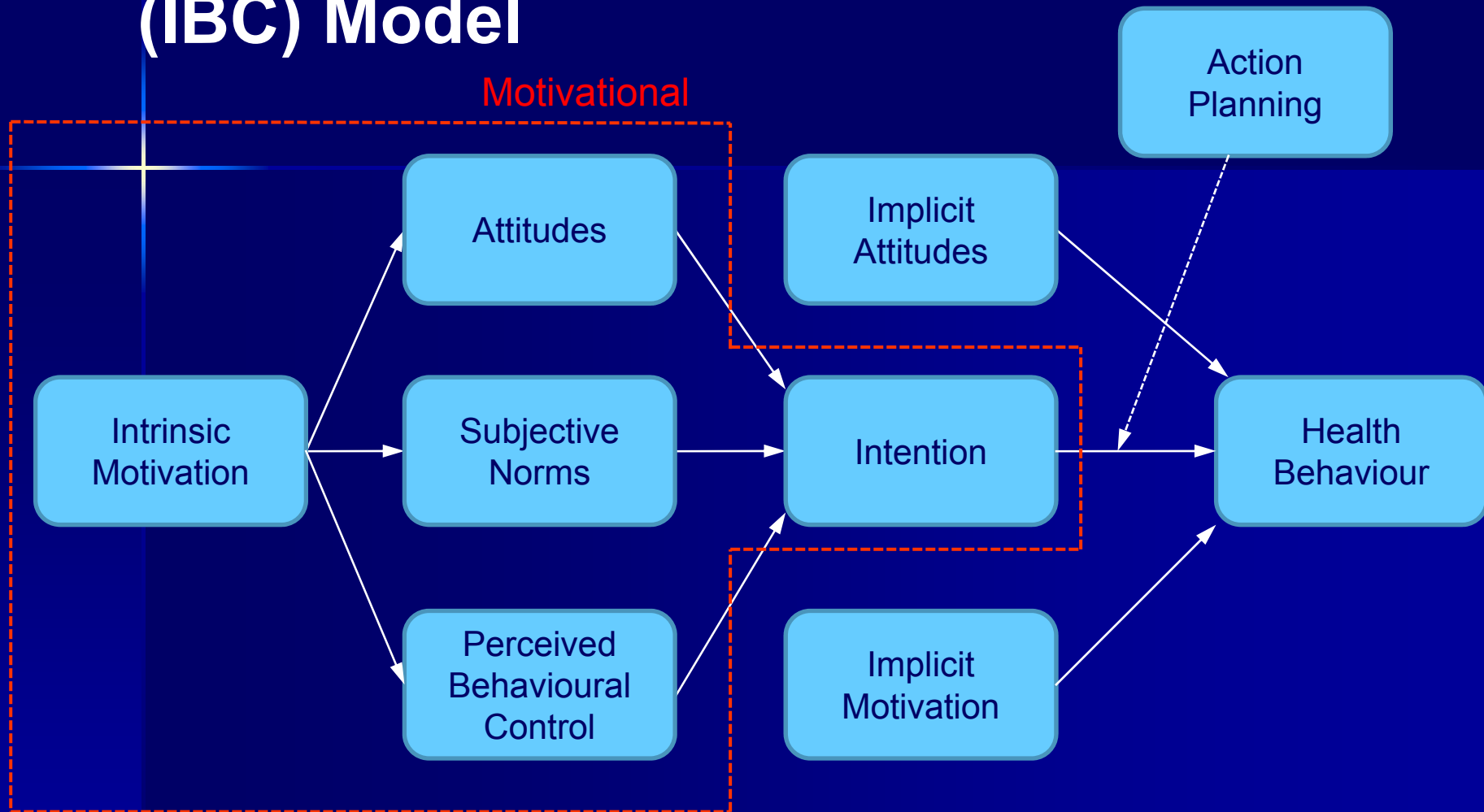
Source: Hagger & Chatzisarantis (2014). *Exercise and Sport Sciences Reviews*.  
Protogerou & Hagger (2017). *Australian Journal of Psychology*.  
Protogerou, Johnson, & Hagger. (2017). *In submission*.

# The Integrated Behaviour Change (IBC) Model



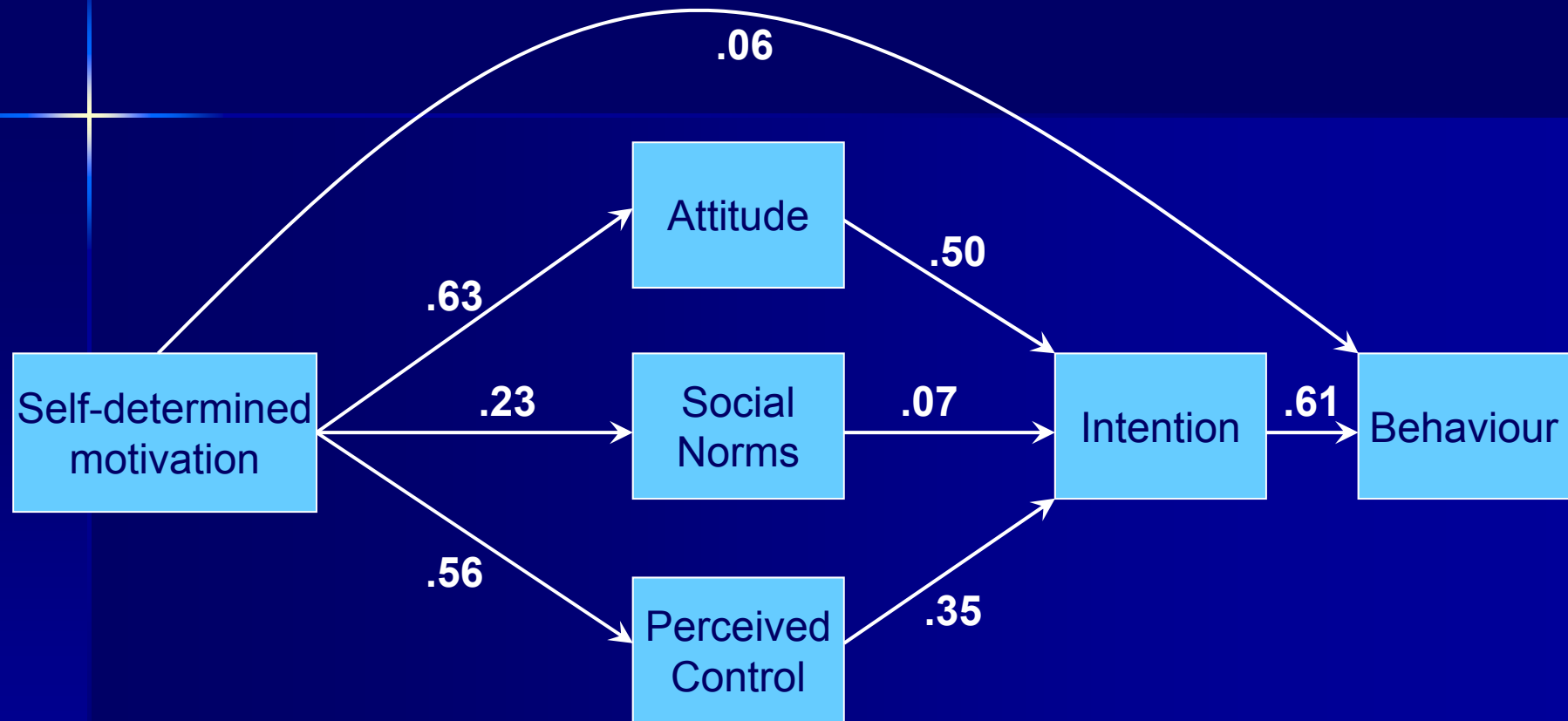
Source: Hagger & Chatzisarantis, N. L. D. (2014). An Integrated Behaviour-Change Model for Physical Activity. *Exercise and Sports Sciences Reviews*.

# The Integrated Behaviour Change (IBC) Model



Source: Hagger & Chatzisarantis, N. L. D. (2014). An Integrated Behaviour-Change Model for Physical Activity. *Exercise and Sports Sciences Reviews*.

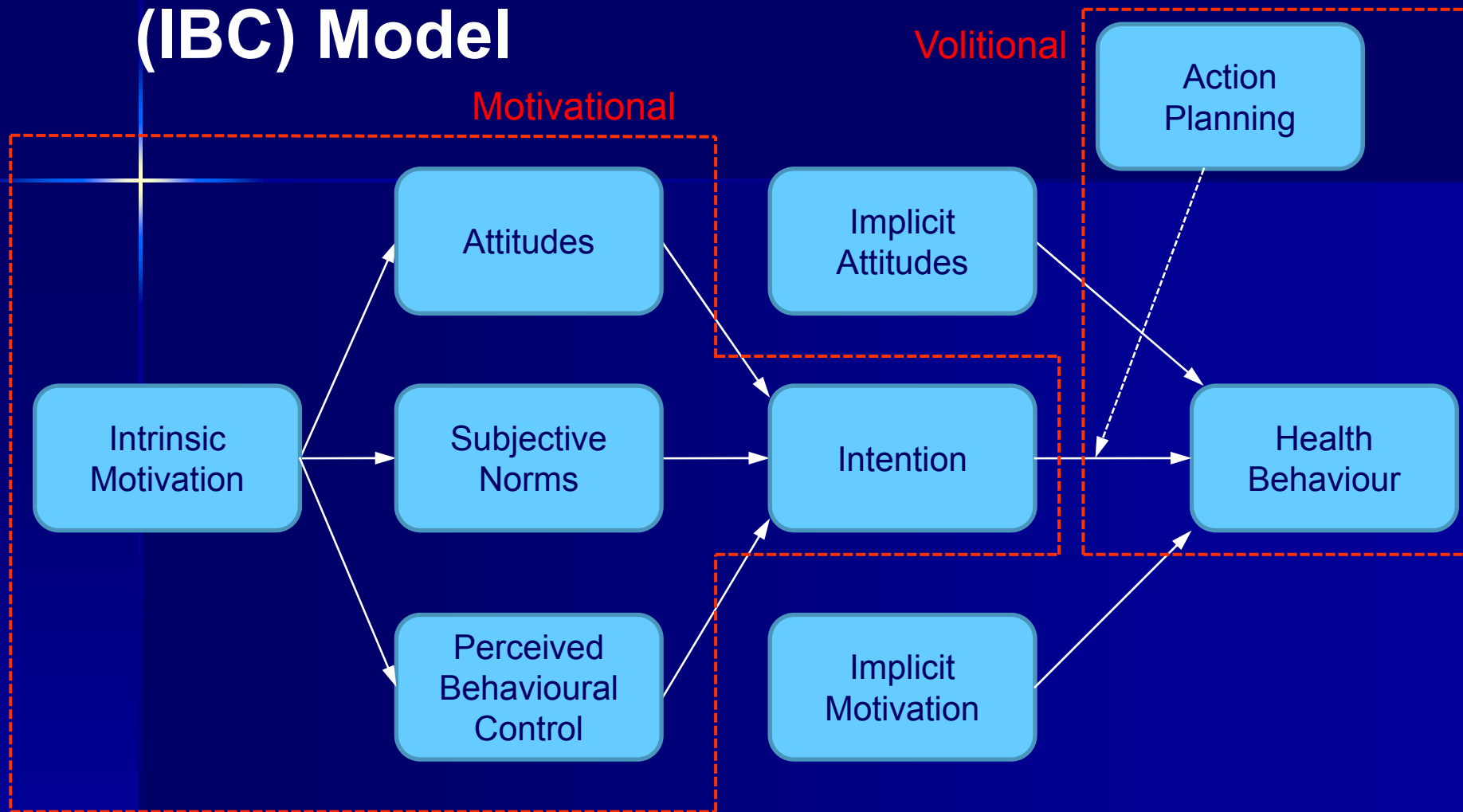
# Theory of Planned Behaviour and Self-Determination Theory



Sources: Hagger et al. (2006) *Personality & Social Psychology Bulletin*  
Hagger & Chatzisarantis (2009) *British Journal of Health Psychology*



# The Integrated Behaviour Change (IBC) Model



Source: Hagger & Chatzisarantis, N. L. D. (2014). An Integrated Behaviour-Change Model for Physical Activity. *Exercise and Sports Sciences Reviews*.

# Filling the 'Intention-Behaviour gap'

## Planning and intention-behaviour relations

*Motivation and Emotion, Vol. 11, No. 2, 1987*

### Thought Contents and Cognitive Functioning in Motivational versus Volitional States of Mind<sup>1</sup>

Heinz Heckhausen<sup>2</sup> and Peter M. Gollwitzer

*Max-Planck-Institut für psychologische Forschung*

*Do people who are about to make a decision differ from people who are about to enact a decision just made with respect to (1) the contents of the spontaneous stream of thought, and (2) aspects of cognitive functioning reflective of short-term memory? Subjects either made a choice between, or were assigned to, two available test materials allegedly designed to measure creativity and differentially suited to promote an individual's full creative potential. Subjects were, however, interrupted prior to or shortly after making this choice: In Study 1, they were asked to report on the thoughts they experienced during the time period just before the interruption; in Study 2, subjects were interrupted either before or after making a choice and were asked to recall lists of words designed to test memory span. The results of Study 1 confirmed our assumption that predecisional versus postdecisional*

## APPLIED PSYCHOLOGY



APPLIED PSYCHOLOGY: AN INTERNATIONAL REVIEW, 2008, 57 (1), 1–29  
doi: 10.1111/j.1464-0597.2007.00325.x

### Modeling Health Behavior Change: How to Predict and Modify the Adoption and Maintenance of Health Behaviors

Ralf Schwarzer\*

*Freie Universität Berlin, Germany*

Health-compromising behaviors such as physical inactivity and poor dietary habits are difficult to change. Most social-cognitive theories assume that an individual's intention to change is the best direct predictor of actual change. But people often do not behave in accordance with their intentions. This discrepancy between intention and behavior is due to several reasons. For example, unforeseen barriers could emerge, or people might give in to temptations. Therefore, intention needs to be supplemented by other, more proximal factors that might compromise or facilitate the translation of intentions into action. Some of these postintentional factors have been identified, such as perceived self-efficacy and strategic planning. They help to bridge the intention-behavior gap. The Health Action Process Approach (HAPA) suggests a distinction between (a) preintentional motivation processes that lead to a

Sources: Heckhausen & Gollwitzer (1987)  
Schwarzer (2008)

# Filling the 'Intention-Behaviour gap'

## Planning and intention-behaviour relations

- Dual-phase models of action: *motivational* vs. *volitional*
- Gollwitzer et al. (1999) Implementation intentions: “Strong effects of simple plans”
- Also known as “if-then” plans (Gollwitzer, 2015)
- Linking context/cue/prompt with the intended action
- e.g. “If condition X arises I will do behaviour Y”
- This does not *change* intentions, but *strengthens* the intention-behaviour relationship

# What Does an Implementation Intention 'Look' Like?

Typically use a 'pen and paper' delivery:

You are more likely to exercise for at least 30 minutes per day if you say when ('if...') and where ('then...') you will exercise and stick to your plan. In the boxes below write down when and where you plan to exercise in the next week:

If...

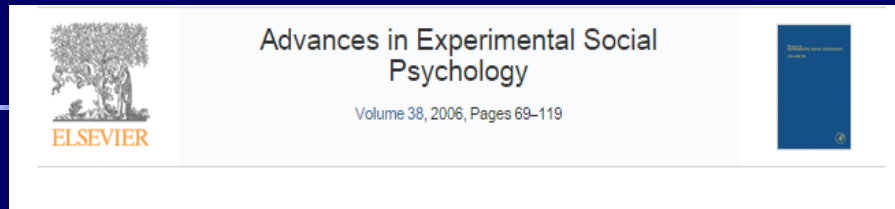
...the clock strikes 12:30pm for lunch...

then...

...I will pick up my gym bag and go to the fitness centre

# Implementation Intentions

## Strong effects of simple plans



### Implementation Intentions and Goal Achievement: Effects and Processes

Peter M. Gollwitzer, Paschal Sheeran

doi:10.1016/S0065-2601(06)38002-1

Holding a strong goal intention ("I intend to reach Z") does not guarantee that people may fail to deal effectively with self-regulatory problems. Whether realization of goal intentions is facilitated by forming a plan (when, where, and how of goal striving in advance ("If situational conditions X, then I will do Y" directed behavior X!)). Findings from 94 independent tests show a positive effect of medium-to-large magnitude ( $d = .65$ ) on goal achievement. This effect is effective in promoting the initiation of goal striving, the shielding of goal striving from situational influences, disengagement from failing courses of action, and

*Psychology & Health*, 2016  
Vol. 31, No. 7, 814–839, <http://dx.doi.org/10.1080/08870446.2016.1146719>



### Implementation intention and planning interventions in Health Psychology: Recommendations from the Synergy Expert Group for research and practice

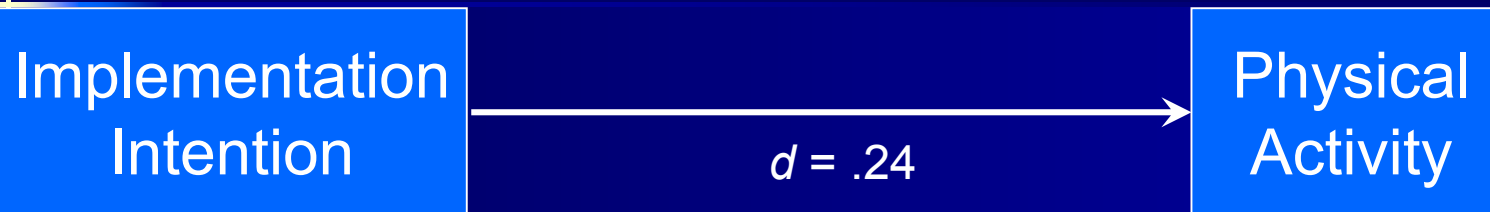
Martin S. Hagger<sup>a,b,c,d,\*</sup>, Aleksandra Luszczynska<sup>e,f,g</sup>, John de Wit<sup>g</sup>, Yael Benyamini<sup>h</sup>, Silke Burkert<sup>i</sup>, Pier-Eric Chamberland<sup>j</sup>, Angel Chater<sup>k</sup>, Stephan U. Dombrowski<sup>l</sup>, Anne van Dongen<sup>m</sup>, David P. French<sup>n</sup>, Aurelie Gauchet<sup>o</sup>, Nelli Hankonen<sup>p</sup>, Maria Karekla<sup>q</sup>, Anita Y. Kinney<sup>r</sup>, Dominika Kwasnicka<sup>s</sup>, Siu Hing Lo<sup>s</sup>, Sofia López-Roig<sup>t</sup>, Carine Meslot<sup>u</sup>, Marta Moreira Marques<sup>v</sup>, Efrat Neter<sup>w</sup>, Anne Marie Plass<sup>w</sup>, Sebastian Potthoff<sup>x</sup>, Laura Rennie<sup>y</sup>, Urte Scholz<sup>z</sup>, Gertraud Stadler<sup>aa</sup>, Elske Stolte<sup>bb</sup>, Gill ten Hoor<sup>cc</sup>, Aukje Verhoeven<sup>dd,ee</sup>, Monika Wagner<sup>ff</sup>, Gabriele Oettingen<sup>gg,hh</sup>, Paschal Sheeran<sup>ii</sup> and Peter M. Gollwitzer<sup>gg,ii</sup>

<sup>a</sup>Health Psychology and Behavioural Medicine, School of Psychology and Speech Pathology, Faculty of Health Sciences, Curtin University, Perth, Australia; <sup>b</sup>School of Applied Psychology and Menzies Health Institute Queensland, Griffith University, Brisbane, Australia; <sup>c</sup>School of Human, Health and Social Sciences, Central Queensland University, Rockhampton, Australia; <sup>d</sup>Faculty of Sport and Health Sciences, Department of Sport Sciences, University of Jyväskylä, Jyväskylä, Finland; <sup>e</sup>University of Social Sciences and Humanities, Wrocław, Poland; <sup>f</sup>Trauma, Health, & Hazards Center, University of Colorado at Colorado Springs, Colorado Springs, USA; <sup>g</sup>Centre for Social Research in Health, Faculty of Arts and Social Sciences, University of New South Wales, Sydney, Australia; <sup>h</sup>Bob Shapell School of Social Work, Tel Aviv University, Tel Aviv, Israel; <sup>i</sup>Institut für Medizinische Psychologie, Charité Universitätsmedizin Berlin, Berlin, Germany; <sup>j</sup>Département de psychologie, Université du Québec à Trois-Rivières, Trois-Rivières, Canada; <sup>k</sup>School of Pharmacy, Centre for Behavioural Medicine, Department of Practice and Policy, University College London, London, UK; <sup>l</sup>School of Natural Sciences, Division of Psychology, University of Stirling, Stirling, UK; <sup>m</sup>Sanquin Blood Supply Foundation, Amsterdam, The Netherlands; <sup>n</sup>School of Psychological Science, University of Manchester, Manchester, UK; <sup>o</sup>Laboratoire Interuniversitaire de Psychologie Personnalité, Cognition, et Changement Social, Université Grenoble Alpes, Grenoble, France; <sup>p</sup>Department of Social Research, University of Helsinki, Helsinki, Finland; <sup>q</sup>Department of Psychology, University of Cyprus, Nicosia, Cyprus; <sup>r</sup>Department of Internal Medicine, University of New Mexico, Albuquerque, USA; <sup>s</sup>Research

Sources: Gollwitzer & Sheeran (2006). *Advances in Experimental Social Psychology*.  
Hagger, Luszczynska et al. (2016). *Psychology & Health*.

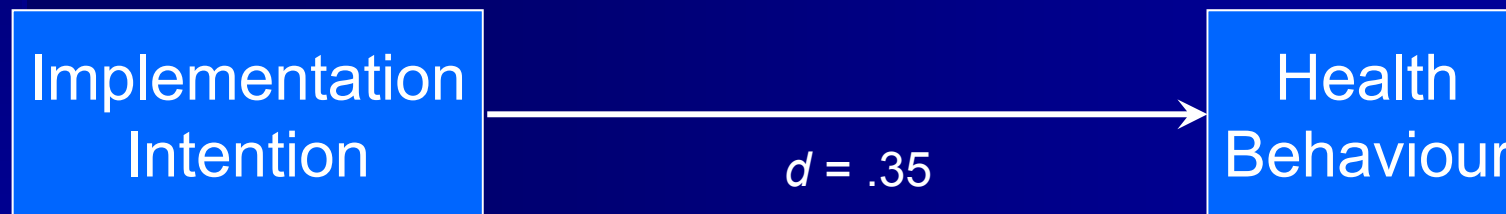
# Meta-Analyses of Plans on Behaviour

## Implementation intentions and dual-phase models



$k = 19$   
 $N = 2,749$

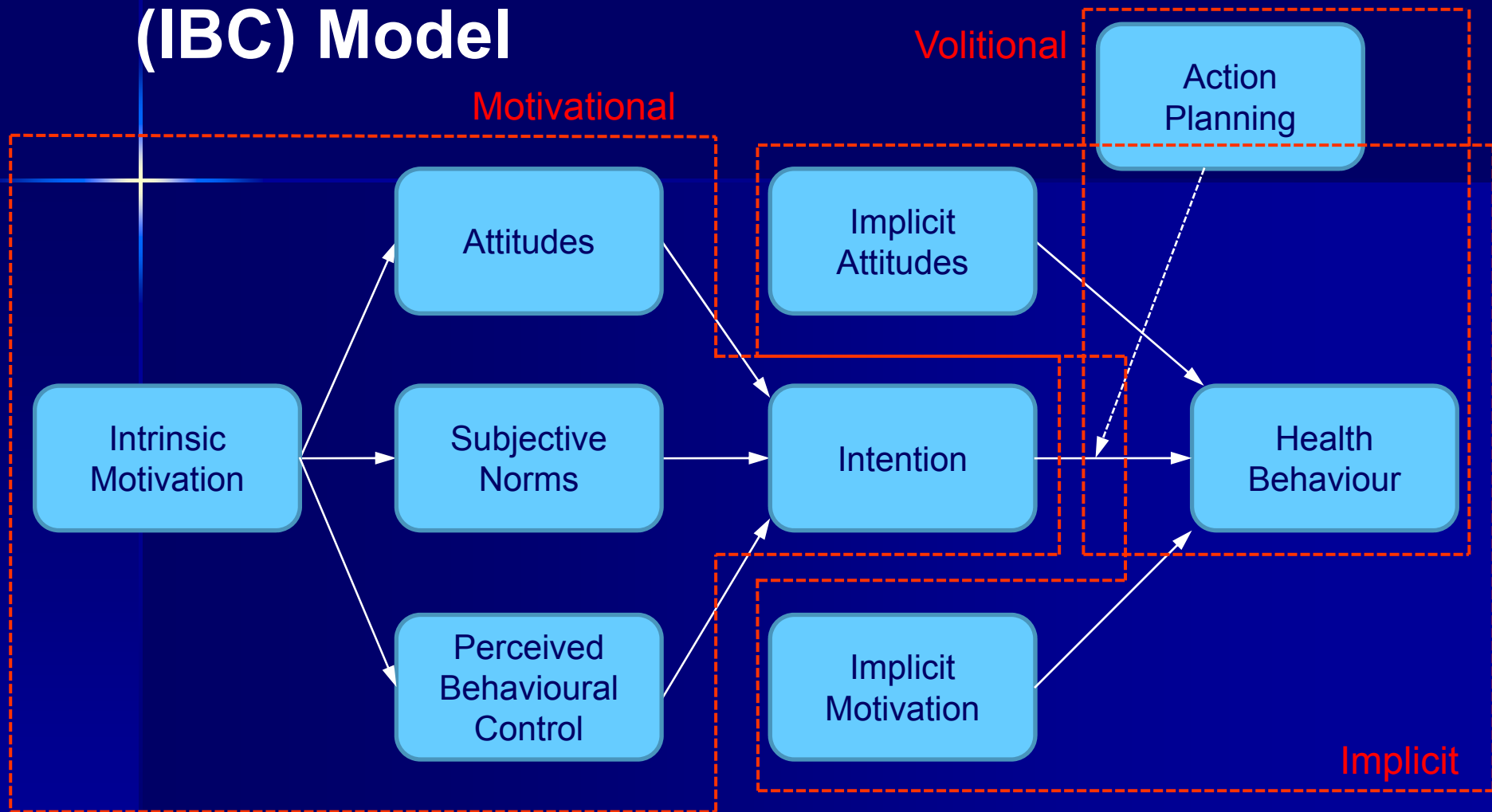
Source: Bélanger-Gravel et al. (2013) – physical activity



$k = 329$   
 $N = 151,126$

Source: Hagger et al. (in preparation) – health behaviours

# The Integrated Behaviour Change (IBC) Model



Source: Hagger & Chatzisarantis, N. L. D. (2014). An Integrated Behaviour-Change Model for Physical Activity. *Exercise and Sports Sciences Reviews*.

# Implicit Attitudes Toward Physical Activity

- Relatively recent addition to research in physical activity (e.g., Greenwald et al. 2002)
- Individuals hold physical activity attitudes that are:
  - Not accessible consciously (Fazio, 1990)
  - Stored as ‘knowledge structures’ – schema (Henderson, Hagger, & Orbell, 2007)
  - Made active or salient by context or ‘cues’ (e.g., Eves et al., 2007)
  - Impact action beyond awareness (e.g., Bargh, 1990)
- ‘Instigation’ or ‘initiation’ to exercise rather than ‘enactment’ or ‘execution’ (e.g., Gardner et al., 2016)



# Explicit and Implicit Attitudes Predict Physical Activity

*Psychology and Health*  
Vol. 24, No. 9, November 2009, 1105–1123



## Associations between visual attention, implicit and explicit attitude and behaviour for physical activity

Raff Calitri<sup>a1</sup>, Rob Lowe<sup>b\*1</sup>, Frank F. Eves<sup>c</sup> and Paul Bennett<sup>d</sup>

<sup>a</sup>*School of Psychology, Keele University, Keele, UK;* <sup>b</sup>*Department of Psychology, Swansea University, Swansea, UK;* <sup>c</sup>*School of Sport and Exercise Sciences, University of Birmingham, Birmingham, UK;* <sup>d</sup>*Centre for Nursing Health and Social Research, Cardiff University, Cardiff, UK*

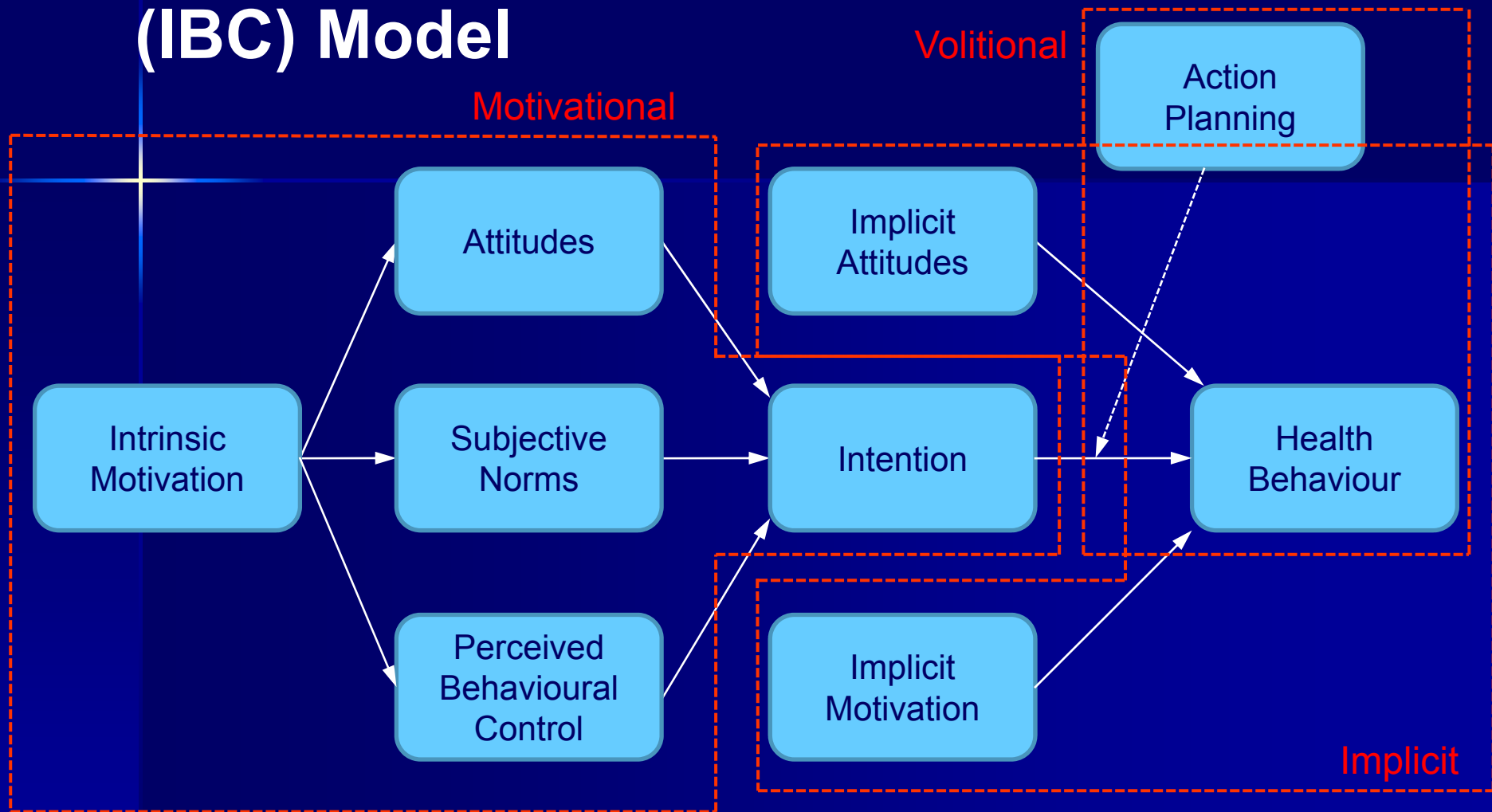
*(Received 20 June 2007; final version received 2 June 2008)*

The current study explored associations between previous physical activity and both implicit and explicit attitudes, as well as visual attention and activity motivation (intention). Analyses were performed on participants initially unaware of the physical activity focus of the study ( $N=98$ ). Higher levels of physical

- Medium-sized effects of both forms of attitudes
- Correlation between two components of attitudes low

Source: Calitri, R., Lowe, R., Eves, F. F., & Bennett, P. (2009). Associations between visual attention, implicit and explicit attitude and behaviour for physical activity. *Psychology and Health*, 24, 1105–1123.

# The Integrated Behaviour Change (IBC) Model



Source: Hagger & Chatzisarantis, N. L. D. (2014). An Integrated Behaviour-Change Model for Physical Activity. *Exercise and Sports Sciences Reviews*.

# Testing the Integrated Model

Int.J. Behav. Med. (2016) 23:282–294  
DOI 10.1007/s12529-015-9531-x



## Predicting Self-Management Behaviors in Familial Hypercholesterolemia Using an Integrated Theoretical Model: the Impact of Beliefs About Illnesses and Beliefs About Behaviors

Martin S. Hagger<sup>1,3,4</sup> · Sarah J. Hardcastle<sup>1</sup> · Catherine Hingley<sup>1</sup> · Ella Strickland<sup>1</sup> · Jing Pang<sup>2</sup> · Gerald F. Watts<sup>2</sup>

J Behav Med (2014) 37:369–380  
DOI 10.1007/s10865-013-9494-9

## Myopia prevention, near work, and visual acuity of college students: integrating the theory of planned behavior and self-determination theory

Derwin King-Chung Chan · Ying-Ki Fung · Susuan Xing · Martin S. Hagger

J Behav Med (2014) 37:1252–1262  
DOI 10.1007/s10865-014-9573-6

## Pre-drinking and alcohol-related harm in undergraduates: the influence of explicit motives and implicit alcohol identity

Kim M. Caudwell · Martin S. Hagger

## JOURNAL OF APPLIED SOCIAL PSYCHOLOGY

### The Influence of Chronically Accessible Autonomous and Controlling Motives on Physical Activity Within an Extended Theory of Planned Behavior

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University of Nottingham  
Nottingham, UK

MARTIN S. HAGGER  
Curtin University  
Perth, Western Australia

An extended theory of planned behavior (Ajzen, 1991), incorporating the post-decisional phase of behavior and constructs from self-determination theory (Deci & Ryan, 1985), was tested for physical activity using a prospective survey design. Participants ( $N = 172$ ) completed measures of intentions, attitudes, subjective norms, perceived behavioral control (PBC), self-determined motivation, continuation intentions, and chronically accessible physical activity motives. Participants completed a self-report measure of physical activity 3 weeks later. Path analysis supported the predictive utility of the proposed model. Importantly, the effect of continuation intentions of success on physical activity behavior was moderated by chronically accessible physical activity motives. Findings underscore the importance of taking into account continuation intentions, self-determined motivation, and individuals' chronically accessible motives when developing physical-activity-promoting interventions.

Increasing rates of obesity in America and Europe are incurring severe health-related consequences and necessitate large-scale behavioral dietary and physical activity interventions to decrease the prevalence of obesity and associated chronic diseases. Mokdad et al. (2003) reported that being overweight and obesity are significantly associated with a variety of chronic

Received: January 27, 2014  
© Springer Science+Business

**Abstract** The present study could be explained using theory, incorporating relevant constructs. Undergraduate female;  $M_{age} = 20.1$  years, comprising measures of pre-drinking cost motive association test. Variance in revealed that the pre-drinking variance in typical pre-drinking 25 % of the variance in

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Abstract  
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## Testing an integrated model of the theory of planned behaviour and self-determination theory for different energy balance-related behaviours and intervention intensities

Nele Jacobs<sup>1\*</sup>, Martin S. Hagger<sup>2</sup>, Sandra Streukens<sup>3</sup>, Ilse De Bourdeaudhuij<sup>4</sup>

<sup>1</sup>Faculty of Medicine  
<sup>2</sup>School of Psychology  
<sup>3</sup>Faculty of Business  
<sup>4</sup>Department of Nutrition

**Objectives:** The self-determined theory of planned behaviour and self-determination theory are theoretically integrated to predict behaviour (planned behaviour).  
**Design:** It screening on and coaching intervention.  
**Methods:** and behaviour squares path.  
**Results:** C

British Journal of Health Psychology (2011), 16, 113–134  
© 2010 The British Psychological Society



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journal homepage: [www.elsevier.com/locate/appet](http://www.elsevier.com/locate/appet)

Appetite



## From perceived autonomy support to intentional behaviour: Testing an integrated model in three healthy-eating behaviours

Laura Girelli<sup>a,\*,4</sup>, Martin Hagger<sup>b</sup>, Luca Mallia<sup>a,c</sup>, Fabio Lucidi<sup>a</sup>

<sup>a</sup> Department of Psychology of Development and Socialization Processes – Sapienza, University of Rome, Italy  
<sup>b</sup> Health Psychology and Behavioural Medicine Research Group, School of Psychology and Speech Pathology, Curtin University, Australia  
<sup>c</sup> Department of Movement, Human and Health Sciences, University of Rome, "Tor Vergata", Italy

### ARTICLE INFO

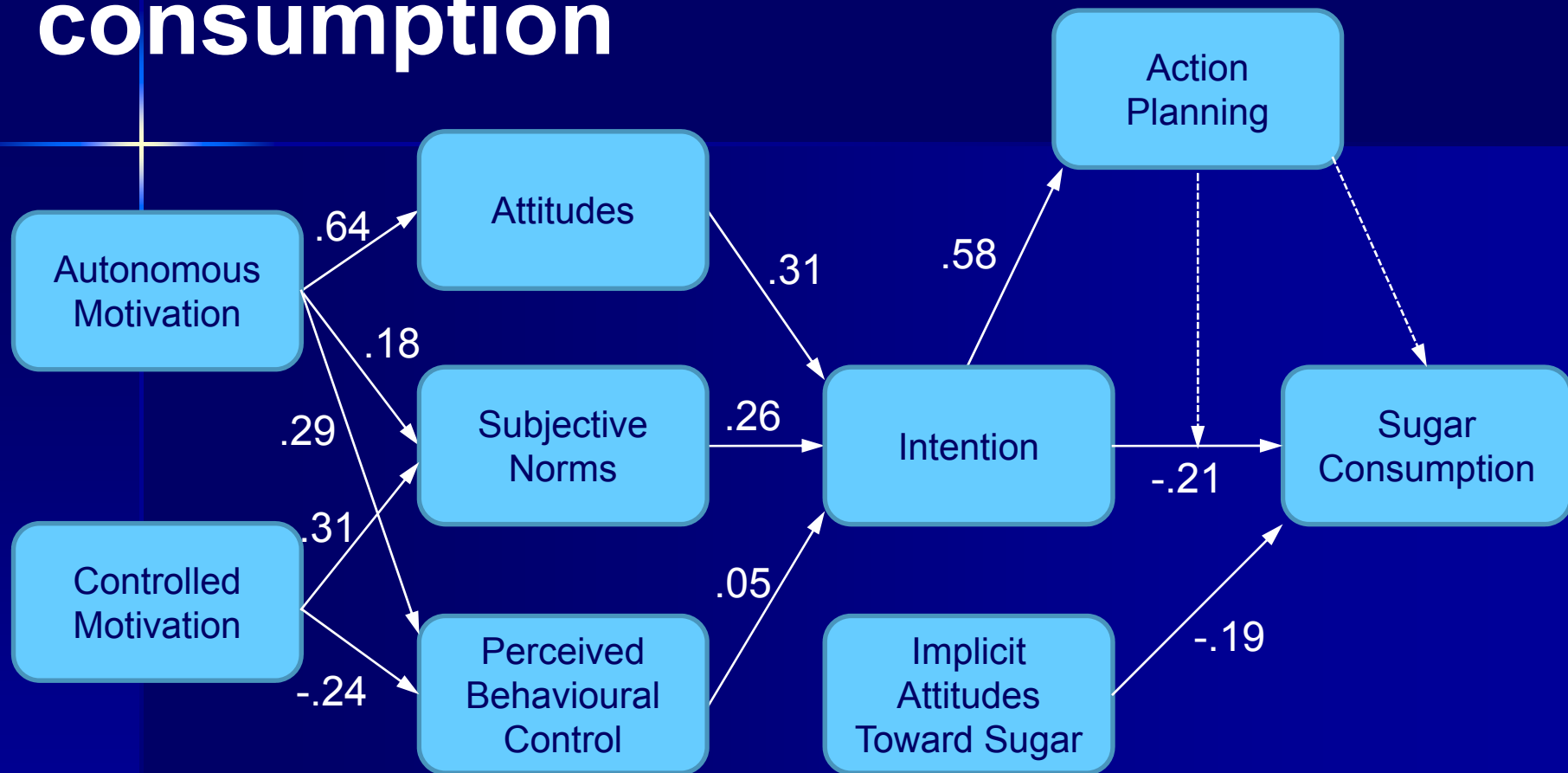
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Self-determination theory  
Theory of planned behaviour  
Fruit and vegetable  
breakfast  
Snack consumption  
Planning  
Theoretical integration

### ABSTRACT

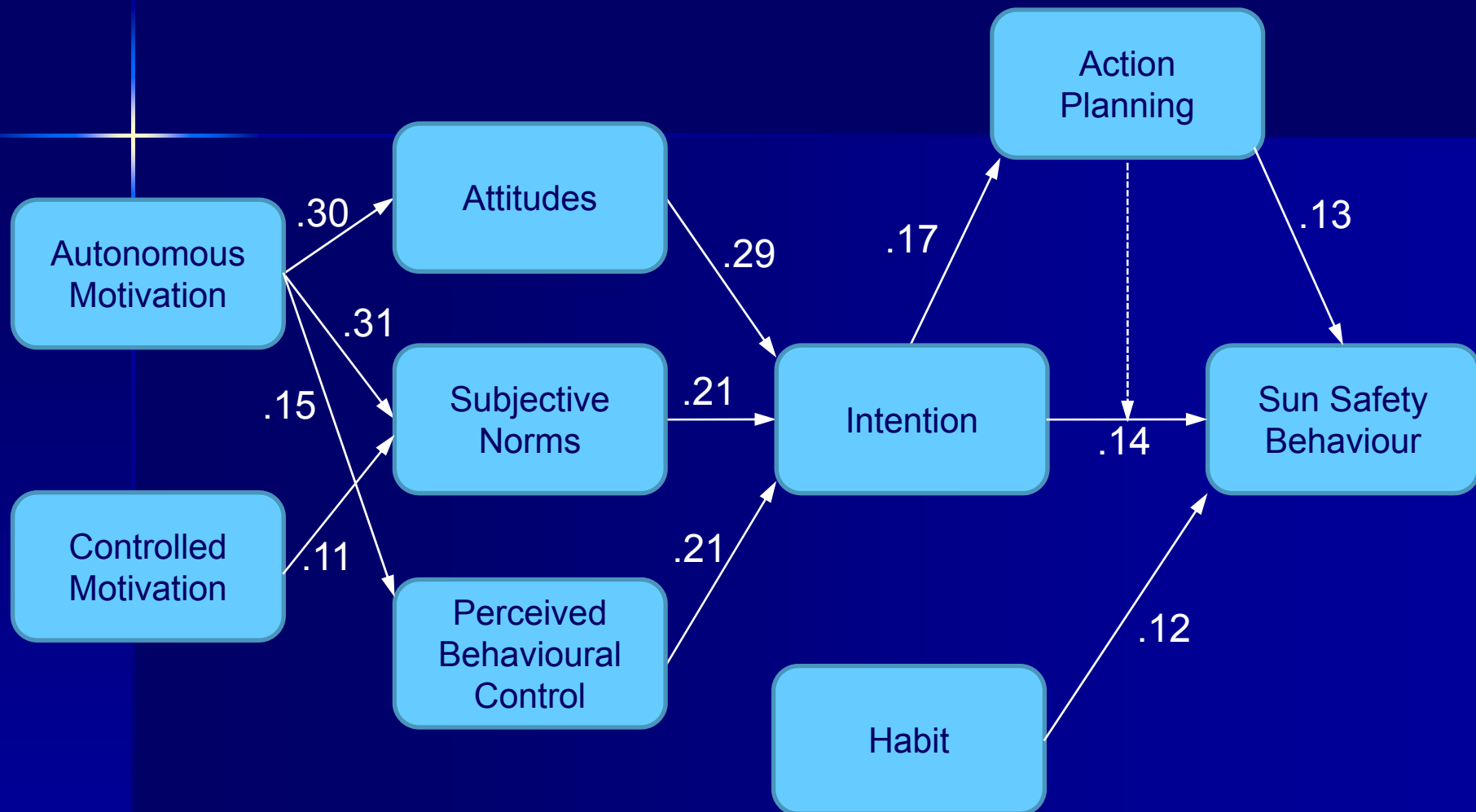
A motivational model integrating self-determination theory, the theory of planned behaviour, and the health action process approach was tested in three samples in three behavioural contexts: fruit and vegetable, breakfast, and snack consumption. Perceived support for autonomous (self-determined) forms of motivation from parents and autonomous motivation from self-determination theory were hypothesised to predict intention and behaviour indirectly via the mediation of attitude and perceived behavioural control from the theory of planned behaviour. It was also expected that planning strategies would mediate the effect of intention on behaviour. Relations in the proposed models were expected to be similar across the behaviours. A two-wave prospective design was adopted. Three samples of high-school students (total  $N = 1041$ ; 59.60% female;  $M_{age} = 17.13$  years  $\pm 1.57$ ) completed measures of perceived autonomy support, autonomous motivation, theory of planned behaviour constructs, planning strategies and behaviour for each of the three behavioural contexts. Three months later, 816 participants (62.24% female;  $M_{age} = 17.13$  years,  $SD = 1.58$ ) of the initial sample self-reported their behaviour referred to the previous three months. Structural equation models provided support for the key hypothesised effects of the proposed model for the three health-related behaviours. Two direct effects were significantly different across the three behaviours: the effect of perceived autonomy support on perceived behavioural control and the effect of attitude on intention. In addition, planning strategies mediated the effect of intention on behaviour in fruit and vegetable sample only. Findings extend knowledge of the processes by which psychological antecedents from the theories affect energy-balance related behaviours.

# Integrated model: Sugar consumption



Source: Hagger et al. (2017). *Appetite*.

# Integrated model: Sun safety



Source: Hamilton, Kirkpatrick, Rebar, & Hagger (2017). *Health Psychology*.

# Advances in Science of Theory-Based Interventions: Intervention mapping

(Kok et al., 2016)

- Formative research has identified theoretical factors to target
- Need to explicitly link behaviour change methods with factors
- 'Intervention mapping'
- Process of making explicit links between factors and BCMs
- Consistent with the basic model of health behaviour interventions

# Basic Process Model for Health Behavioural Interventions



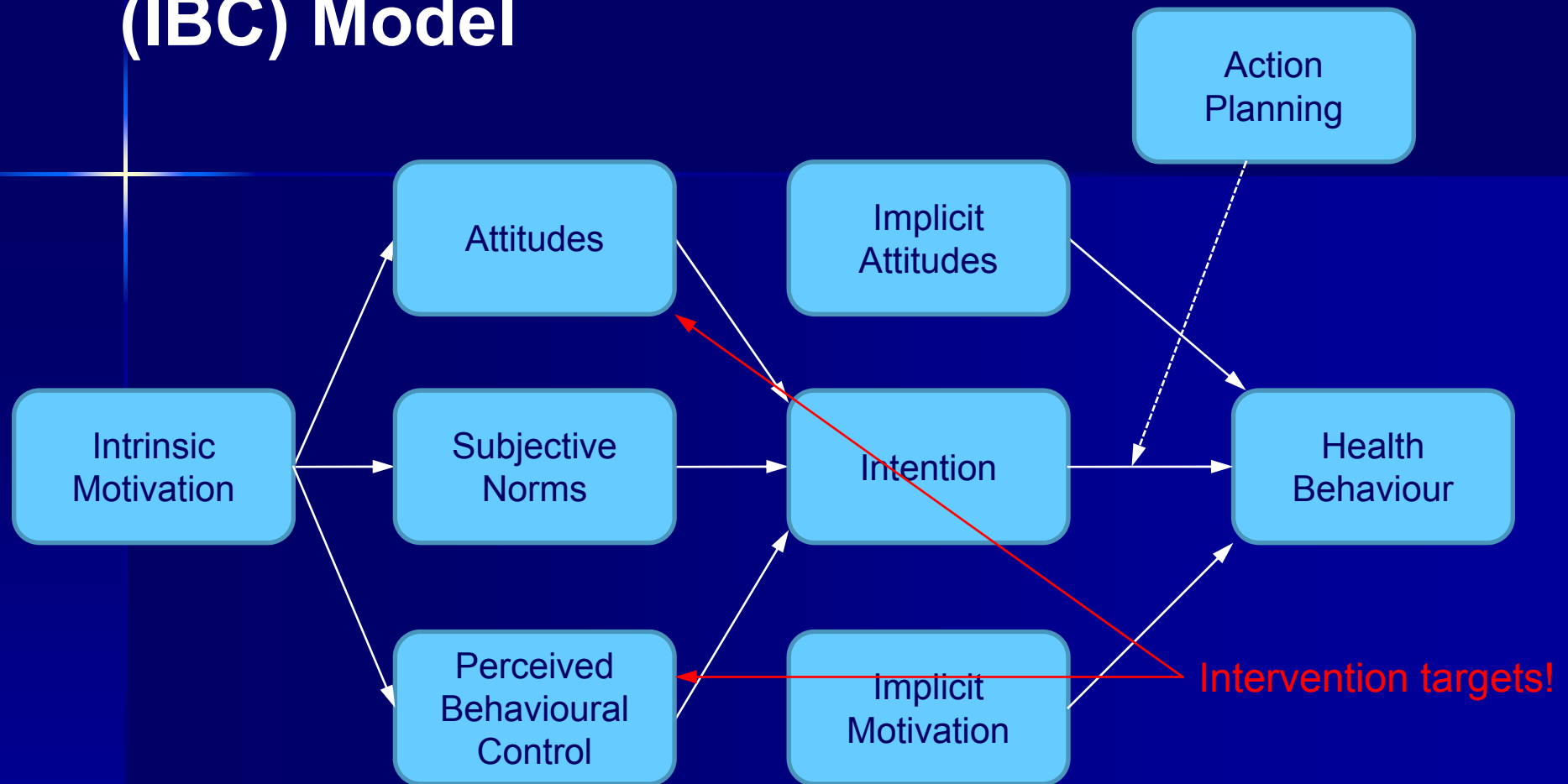
# Example of Mapping Intervention Components

Theory	Construct(s)	Intervention component
Reasoned Action Approach (RAA)/ Theory of Planned Behaviour (TPB)	Attitudes	<ul style="list-style-type: none"><li>• Provide information on behaviour targeting <b>SALIENT</b> beliefs</li><li>• Emphasise negative consequences</li><li>• Emphasise susceptibility</li></ul>
Social Cognitive Theory	Perceived control/ Self-efficacy	<ul style="list-style-type: none"><li>• Set graded goals</li><li>• Model/demonstrate</li><li>• Rehearsal through imagery</li><li>• Prompt practice</li><li>• Prompt barrier identification</li></ul>
Self-determination theory	Autonomous motivation	<ul style="list-style-type: none"><li>• Provide choice</li><li>• Prompt self (intrinsic) rewards</li><li>• Provide contingent rewards</li></ul>
Model of action phases	Planning	<ul style="list-style-type: none"><li>• Prompt specific (e.g., if-then) plans</li></ul>



**What are the implications of these findings for behaviour change?**

# The Integrated Behaviour Change (IBC) Model



Source: Hagger & Chatzisarantis, N. L. D. (2014). An Integrated Behaviour-Change Model for Physical Activity. *Exercise and Sports Sciences Reviews*.

# Changing Personal Beliefs (Attitudes)

- Provide general information on behaviour-health link
- Describe consequences of behaviour

A pamphlet identifying possible benefits of exercise and how it can promote health (e.g., fitness, weight loss, social benefits)

**MOVE FOR HEALTH**

**ENERGIZE YOUR LIFE!**

**PHYSICAL ACTIVITY**

For more information, visit the health center or the health educator at the HECOPAB office in your area.

Ministry of Health (Belize, C.A.)

Pan American Health Organization

World Health Organization

2009

**PHYSICAL ACTIVITY**

**Physical Activity**

It is very important to help you maintain physical and mental health and have a good quality of life.

Walking, stretching and keeping your muscles in good condition can help your remain healthy, whatever your age.

Regular physical activity is very effective in helping you to lose weight. It also helps in weight maintenance by using excess calories that otherwise would be stored as fat.

**Daily Physical Activity**

Physical activity can help prevent heart disease and stroke by strengthening heart muscles, lowering blood pressure, lowering cholesterol, improving blood flow and increasing the heart's working capacity.

Physical activity can also help to prevent and control non-insulin dependent Type 2 diabetes.

Physical activity helps to prevent back pain by increasing muscle strength and improving flexibility through regular exercise.

Engaging in regular physical activity such as weight bearing exercises can promote bone formation and prevent osteoporosis.

**Exercises also has a psychological effect, and can improve your mood and how you feel about yourself.**

**Physical activity does not have to be hard to improve your health.**

If you are not active and you start increasing your physical activity, you should start to see benefits in 4 to 12 weeks. Start slowly and gradually build up.

Choose activities from each of these groups:

**Moderate Intensity (30 minutes daily)**

- Walking your dog
- Climbing stairs
- Cleaning your room
- Gardening

**Endurance (20 minutes 3 times a week)**

These are activities that make your feet warm and keep you to breathe deeply.

- Jogging
- Cycling
- Swimming
- Aerobics
- Dancing
- Skating
- Basketball

**Get out and get active.**

It's not too late to get active.

**How hard?**

It's a good idea to have physical activity if you don't have a medical condition. However, if you have a medical condition, it's important to talk to your doctor first.

**What is the best activity to do?**

Any activity that gets you moving is good for you. The best activity is one that you enjoy and that you can do regularly.

**How much?**

Try to get at least 30 minutes of physical activity most days of the week. If you can't do 30 minutes at once, you can do it in smaller amounts throughout the day.

**Physical activity simply is the movement of your body to use energy.**

Being physically active is an important part of a healthy lifestyle to help burn the energy (calories) we get from the foods we eat.

**PHYSICAL ACTIVITY SHOULD NOT BE A CHORE.**

**The more physical activity that you do, the greater the health benefits and the better you'll feel.**

**Why is ACTIVITY NEEDED?**

**A HEALTHY HABIT: Physical Activity**

Physical activity is important for both immediate and long-term health benefits.

**BEING PHYSICALLY ACTIVE CAN HELP YOU:**

- Increase your chances of living longer
- Feel better about yourself
- Sleep better at night
- Strengthen your muscles and bones
- Maintain or achieve a healthy weight
- Meet new people or spend time with friends
- Have more fun!

Discover activities that you enjoy and get moving!

**Have fun!**

**Learning Zones Express**

This pamphlet just offers information. If you need care, contact your provider.

© Learning Zones Express | www.LearningZonesExpress.com  
 1-800-888-4633 | All rights reserved | Do not duplicate  
 UPC: 681723284813

**RECOMMENDATION:**

Students should do 60 minutes (1 hour) or more of physical activity daily.

**REALITY:**

Many students are not getting opportunities to be active.

Over half of all schools have 10% or less of their students walking or biking to and from school.

Only 45% of all schools provide opportunities for students to participate in classroom physical activity breaks.

Only 55% of all schools offer opportunities for students to participate in physical activity clubs or intramural sports programs.

Less than 4% of schools require daily physical education.

Source: School Health Policies and Practices Study 2014

# Changing Risk Perceptions

- Emphasise personal susceptibility to negative consequences of behaviour
- Prompt assessment of personal risk

A poster illustrating possible susceptibility or risk for acting (or not acting)

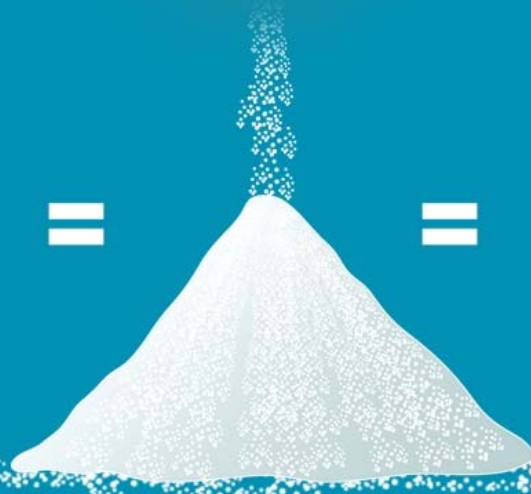
# Information Provision

One 375ml  
can of soft  
drink a day



=

Almost 15kgs of  
sugar a year



=



Toxic fat and  
increased risk  
of type 2  
diabetes,  
heart disease  
and some  
cancers

**LIVELIGHTER**  
®

[livelighter.com.au](http://livelighter.com.au)

# Basic Process Model for Health Behavioural Interventions



# Promoting Self-Efficacy

- Model/demonstrate the behaviour
- Prompt behavioural practice
- Prompt barrier identification and planning in relation to anticipated barriers
- Prompt self-monitoring of behaviour
- Provide feedback on performance

Instruct and practice on skills on how to monitor behaviour (e.g., devices, diaries)



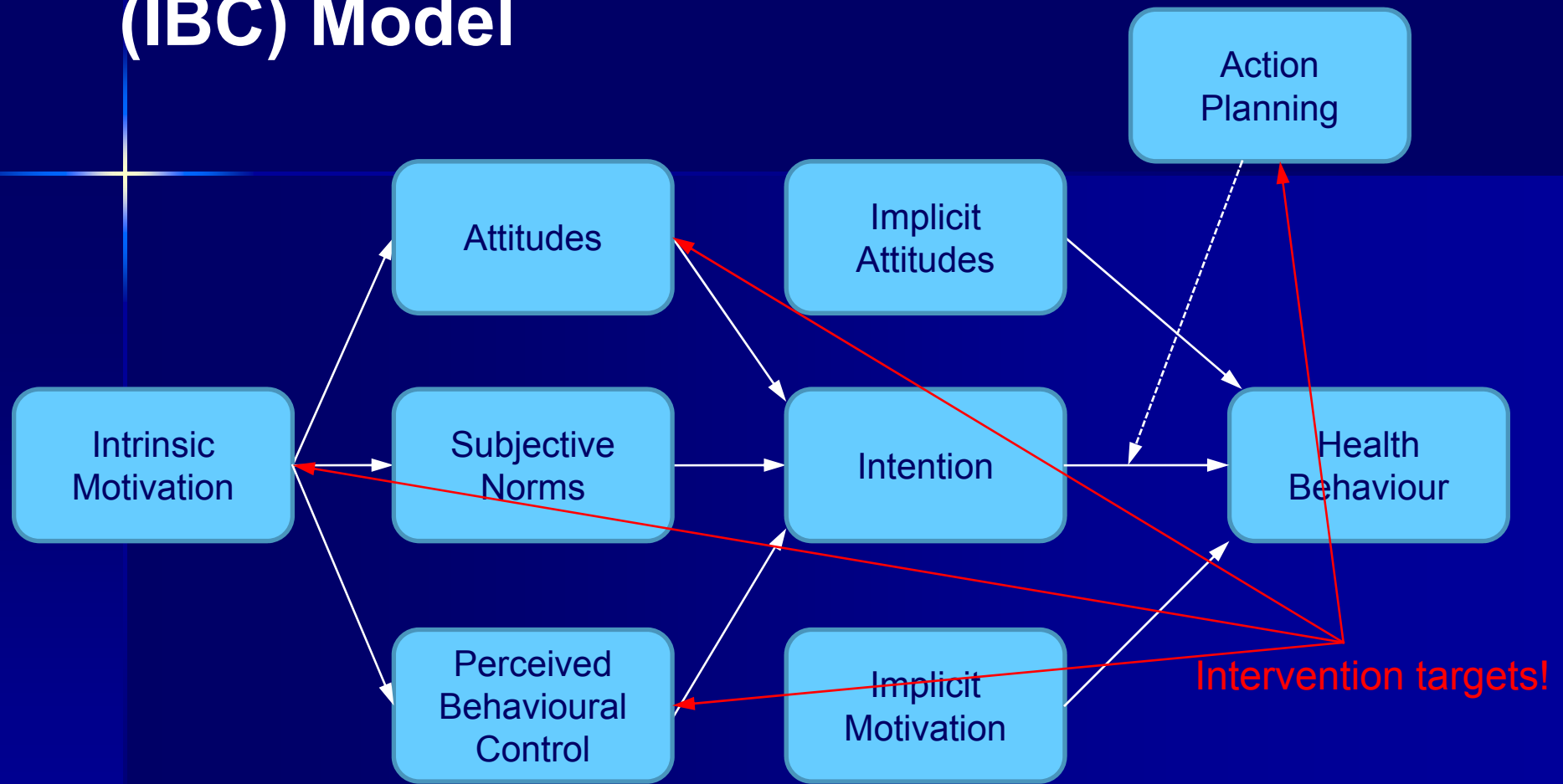
# Promoting Self-Efficacy



# Basic Process Model for Health Behavioural Interventions



# The Integrated Behaviour Change (IBC) Model



Source: Hagger & Chatzisarantis, N. L. D. (2014). An Integrated Behaviour-Change Model for Physical Activity. *Exercise and Sports Sciences Reviews*.

## A brief intervention to increase physical activity behavior among adolescents using mental simulations and action planning

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### ABSTRACT

This study evaluated the effectiveness of a brief integrated theory-based intervention to increase physical activity (PA) among adolescents over a three-month follow-up period. A 2 (mental simulation: present vs. absent) × 2 (action planning: present vs. absent) × 4 (time: baseline vs. one-month vs. two-month vs. three-month follow-up) mixed-model randomized controlled design was adopted. Adolescents aged 14–15 years ( $N = 267$ ) completed baseline psychological measures and self-reported PA followed by the relevant intervention manipulation, if appropriate, with follow-up measures collected one, two, and three months later. Results revealed no significant effects for the mental simulation and action planning strategies nor the interaction of the two strategies. However, among participants with low levels of baseline PA, participants in both mental simulation alone and action planning alone groups reported significantly higher levels of PA at one-month follow up than other groups, suggesting that individual intervention components may be effective in low-active adolescents.

### ARTICLE HISTORY

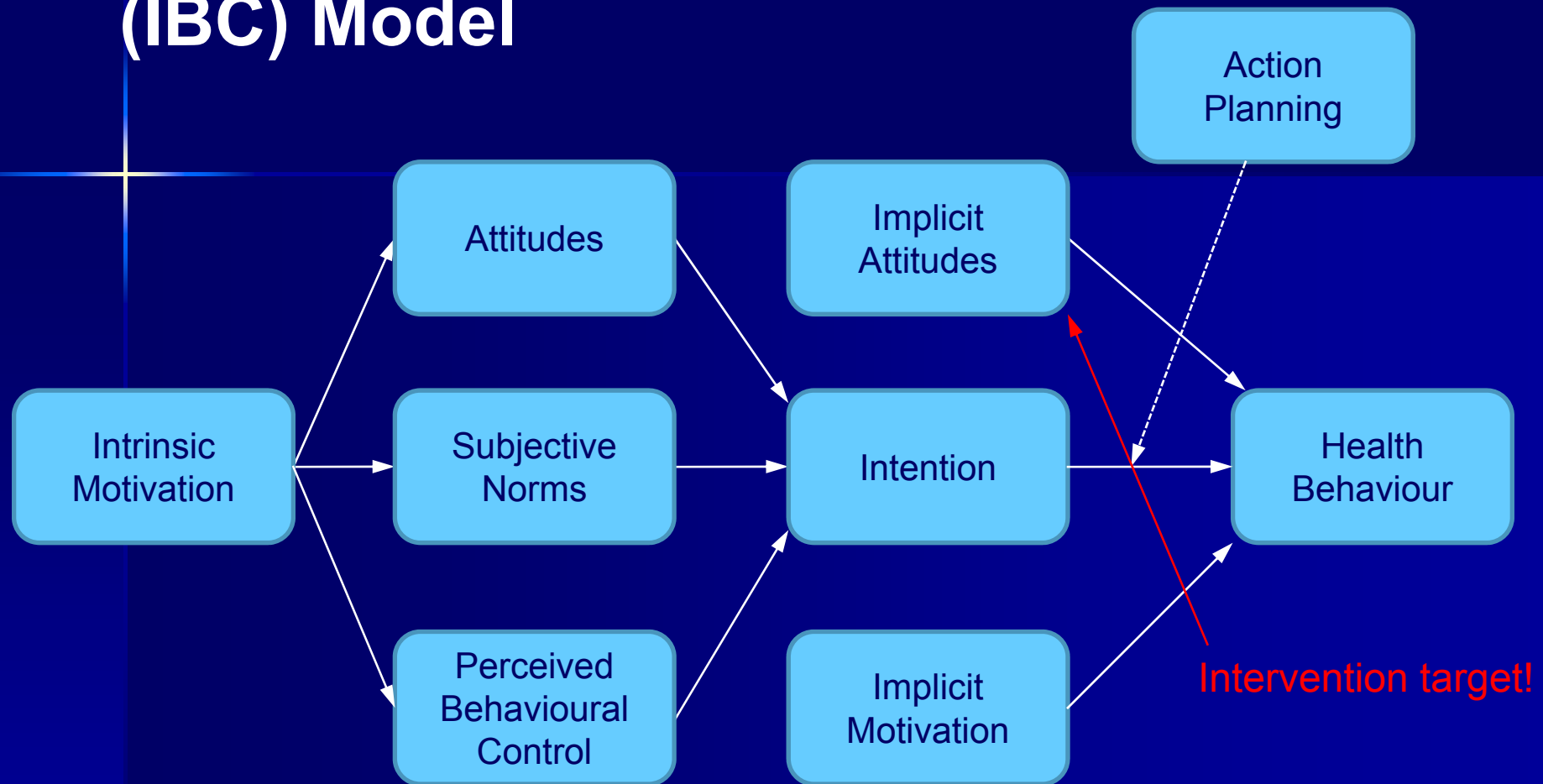
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### KEYWORDS

Adolescents; action planning;  
outcome mental simulation;  
physical activity; randomized  
controlled trial

Koka, A., & Hagger, M. S. (2016). A brief intervention to increase physical activity behavior among adolescents using mental simulations and action planning. *Psychology, Health & Medicine*. doi: 10.1080/13548506.2016.1211298

# The Integrated Behaviour Change (IBC) Model



Source: Hagger & Chatzisarantis, N. L. D. (2014). An Integrated Behaviour-Change Model for Physical Activity. *Exercise and Sports Sciences Reviews*.

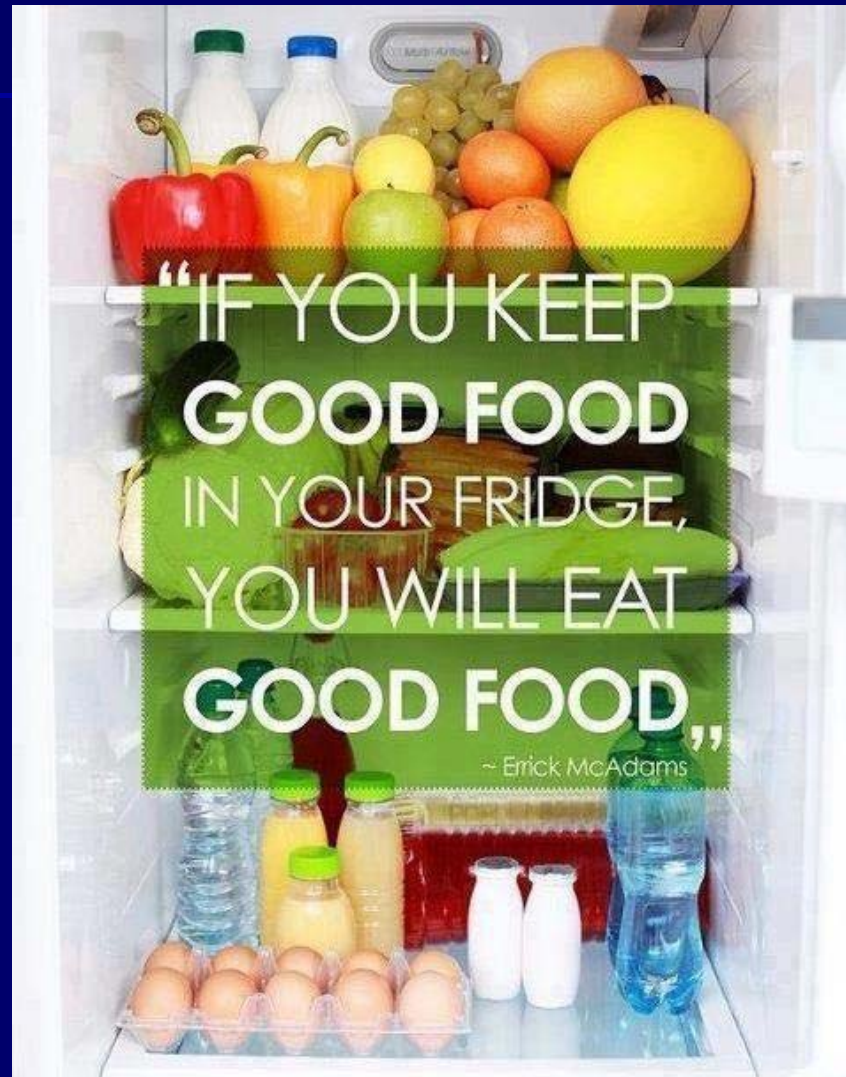
# Promoting Environmental Change

- Teach to use environmental prompts/cues
- Teach to avoid environmental prompts/cues

Training people to structure their environment to minimize lapses

(could be used in conjunction with cue identification and planning)

# Restructuring the Environment



# Physical Activity in Tailored Intervention in Hospital Staff (PATHS) Study

- Promoting physical activity and reduced stress in hospital staff
- Online tailored intervention in an RCT:
  - Control (information only)
  - Motivation (motivational BCT)
  - Self-regulation (motivation and self-monitoring)
  - Habit (motivation, self-monitoring, habit)
- Preliminary findings after first follow up indicate good effects for habit and self-regulation

Source: Kwasnicka, Vandelanotte, Rebar, Gardner, Short, Duncan, & Hagger (in preparation)



# Summary

- Theory is important to inform knowledge on predictors, mechanisms and processes of behaviour change
- Are our theories 'any good'?
- Our theories are 'good' – evidence base, mechanisms, driving behaviour change methods
- Our theories are 'not so good' – Problems of evidence for behaviour change theories and interventions
- Better evidence through integration, accurate reporting, intervention mapping, factorial designs

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