

Behaviour change models and theories

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Introductions

What is your knowledge and experience of behaviour change models and theories?

Learning outcomes

Behaviour change models, theories, and their application at an individual and population level for the promotion and protection of health and wellbeing:

- Understanding of the theoretical basis of behavioural science and associated core models of behaviour change
- Awareness of the comparative strengths and weaknesses of different models
- Understanding of how models can be applied to the design, implementation and evaluation of health promotion interventions

Behaviour change and public health

- Non communicable diseases now have greatest impact on premature morbidity and mortality. Addressing this requires changes to behaviours such as tobacco smoking, alcohol use, physical activity, and diet
- Preventing spread of infectious diseases (link to COVID and how beh change played a key role)
- Behaviours that limit progression and effects of LTCs and illness e.g. adherence to meds , seeking and engaging in support or treatment
- Behaviours that deliver health and social care – designing and delivering interventions in line with the evidence - 30-40% patients not receiving treatment of proven effectiveness /20-25% patients receiving care that is not needed or potentially harmful

Behaviour change

- Assumption that its common sense but this has repeatedly led to ineffective interventions wasting money, resource and opportunity
- Assumption that providing/increasing knowledge will change behaviour – doesn't account for the role of values, beliefs, emotions, habit, the environment
- Behaviour change needs to be studied as a science using tried and tested approaches – need to go beyond common sense
- Understanding the nature of a behaviour and the context in which it is occurs is important in developing effective interventions

Complexity of behaviour change

- Interventions aimed at changing behaviours typically consist of many inter related components – difficult to identify which of these are leading to change
- Diversity of interventions within public health
- Number of behaviours/audiences/outcomes
- Individual/community/population level
- Implementation of interventions – fidelity of delivery

What are the behavioural sciences?

- Range of disciplines that study individual behaviour and social systems.
- ‘Behavioural insights’ and behaviour change methodologies have been gaining recognition over the last ten years.
- These approaches combine findings from fields such as cognitive psychology, behavioural economics, social psychology and health psychology to understand human behaviour and decision making
- Behavioural insights can be used to develop and evaluate behaviour change interventions and the approach has now gained support from key leaders



Public Health
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Protecting and improving the nation's health

Improving people's health:
Applying behavioural and social sciences
to improve population health and
wellbeing in England



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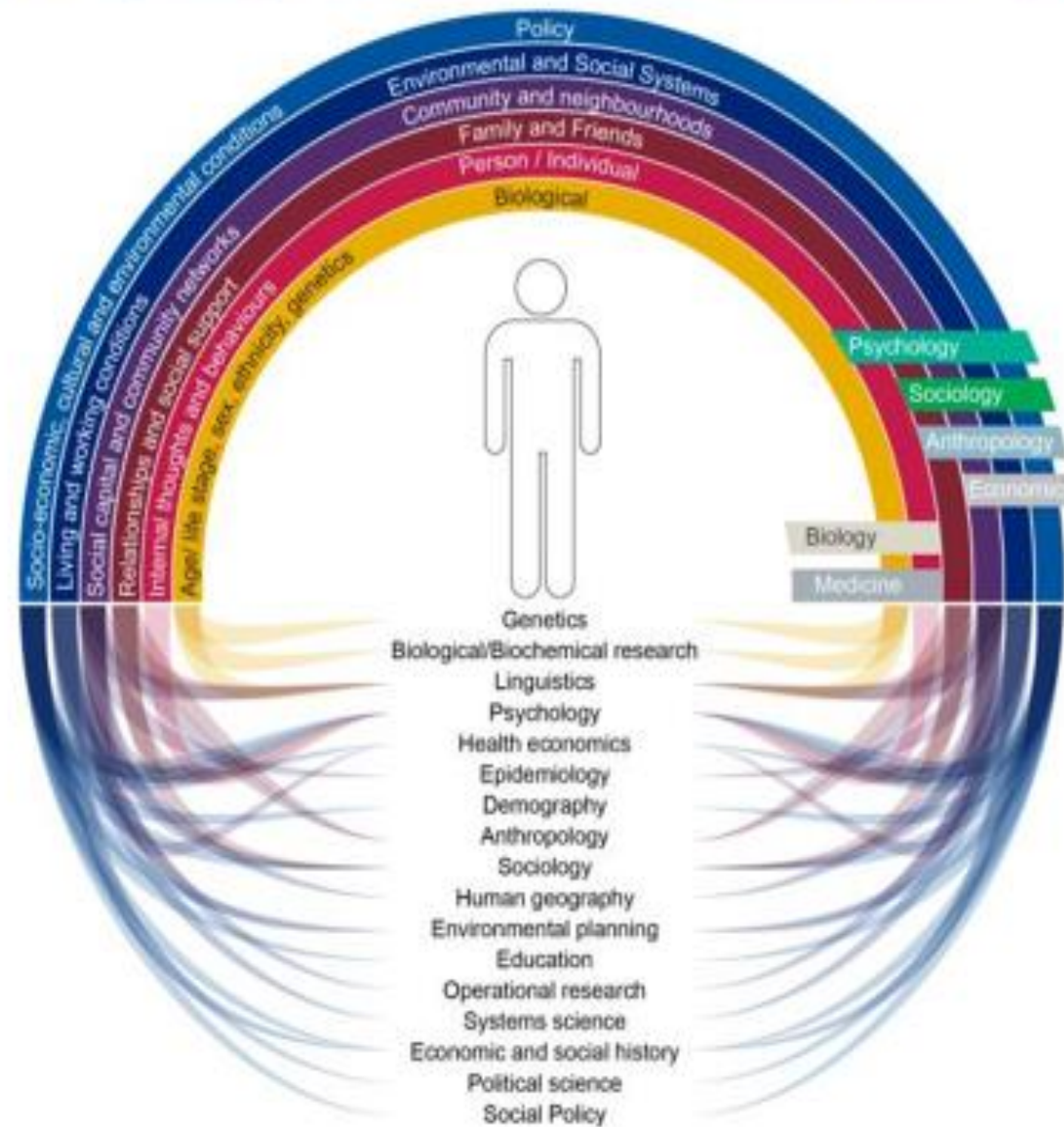


Behavioural Science and
Public Health Network



Local
Government
Association

Figure 3: Conceptualising the contributions of behavioural and social science disciplines



What can Behavioural Scientists bring to public health?

- They are skilled in the application of behaviour change theories and models
- Behavioural and social scientists have valuable research and methodological skills
- They can contribute quantitative and qualitative skills for evaluation, to understand what works, how it works, why, and for whom
- They can provide training and development in the application of behaviour change theories and frameworks

Definition of a theory

“a set of concepts and/or statements with specification of how phenomena relate to one another. Theory provides a organising description of a system that accounts for what is known, and explains and predicts phenomena”

How can they help?

- Theories provide a framework to help the designer of an intervention identify what needs to change
- Theories provide a common language
- They aid the research process – methodology to address research questions
- Use of theory promotes a systematic approach to exploring the full range of potential drivers of behaviours and levers for change
- Supports with evaluation – can determine whether the intervention influenced identified driver and whether this in turn had an impact on the behaviour
- Theory can advance understanding of what works and why – helps in refining interventions for different contexts, populations and behaviours

Theories of behaviour change

- MRC recommends identifying relevant theories when developing any complex intervention
- Mixed evidence of impact of theory informed v non theory informed interventions
- Could be due to the way in which the theory is applied – reported that generally use of theory in intervention design is inadequate
- Choice of appropriate theory can also play a role

Criteria for a good theory

- Can account for observations made
- Should be able to generate predictions so that it can be tested
- Evidence for independence of constructs
- Relationships between constructs should be clearly described
- Measurability of constructs
- Should describe mechanism of change
- Empirical support for theory
- Evidence that the theory applies across different contexts, populations and behaviours

How many theories are there?

- Large number of behaviour change theories
- Most address a small sub set of relevant constructs and there is overlap between them
- Most widely used theories focus on beliefs rather than emotions or habit
- Until recently have also tended to focus on intra individual and interpersonal rather than broader social and economic factors
- Little guidance on how to chose an appropriate theory

Social Cognition Theories of health behaviour

Continuum theories:

- Health Belief Model
- Theory of Planned Behaviour
- Theory of Reasoned Action
- Protection Motivation Theory
- Social Cognitive Theory
- Social Learning Theory

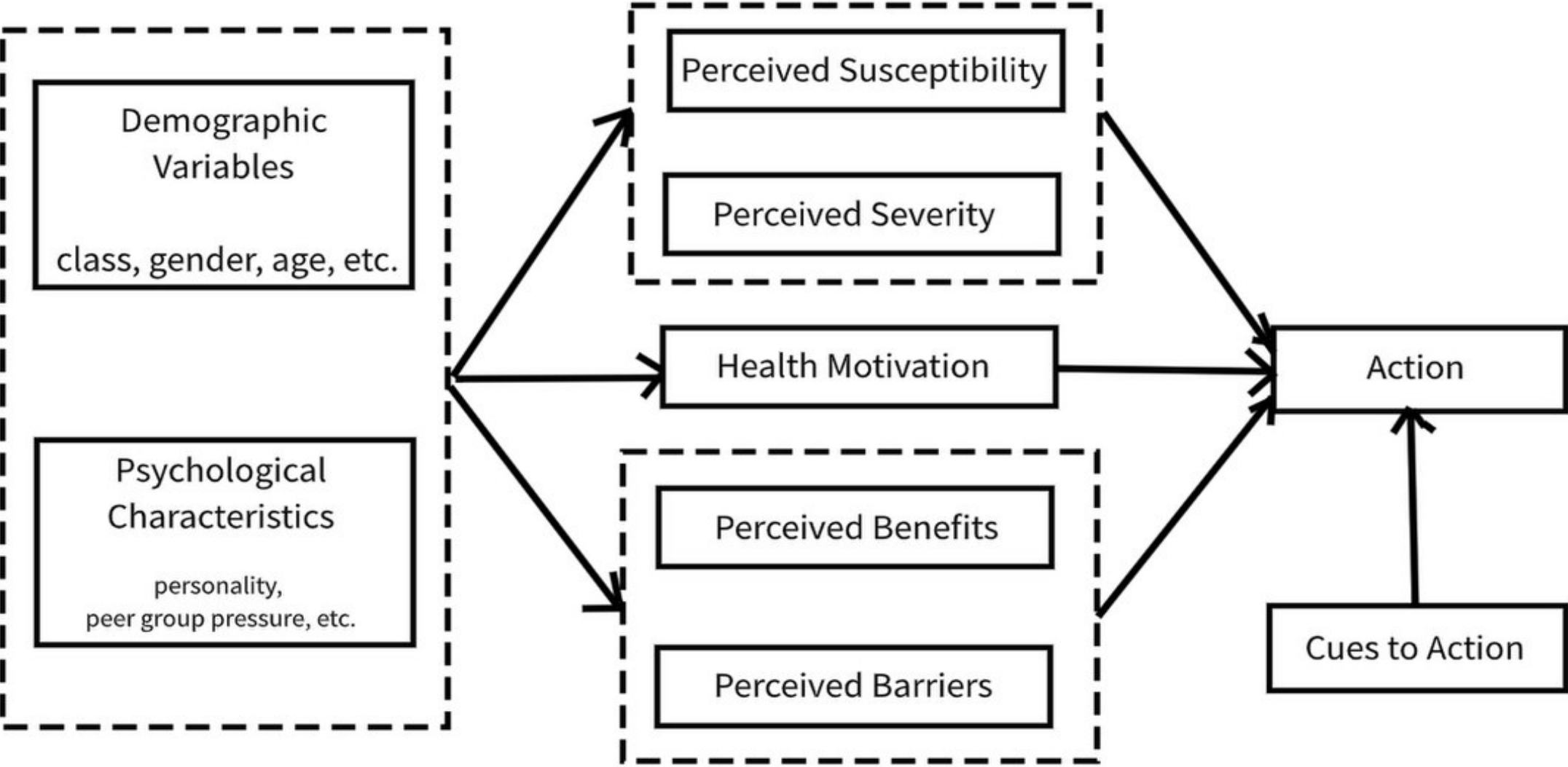
Stage theories:

- Transtheoretical Model
- Rubicon Model of Action Phases
- Health Action Process Approach

Motivation theories:

- Self Determination Theory
- PRIME theory

The Health Belief Model



Health Belief Model (HBM)

Evidence to support HBM

Carpenter (2010)

A meta analysis found that variables relating to severity, barriers, and benefits were all related to the likelihood of performing the behaviour. Benefits and barriers were the strongest predictors.

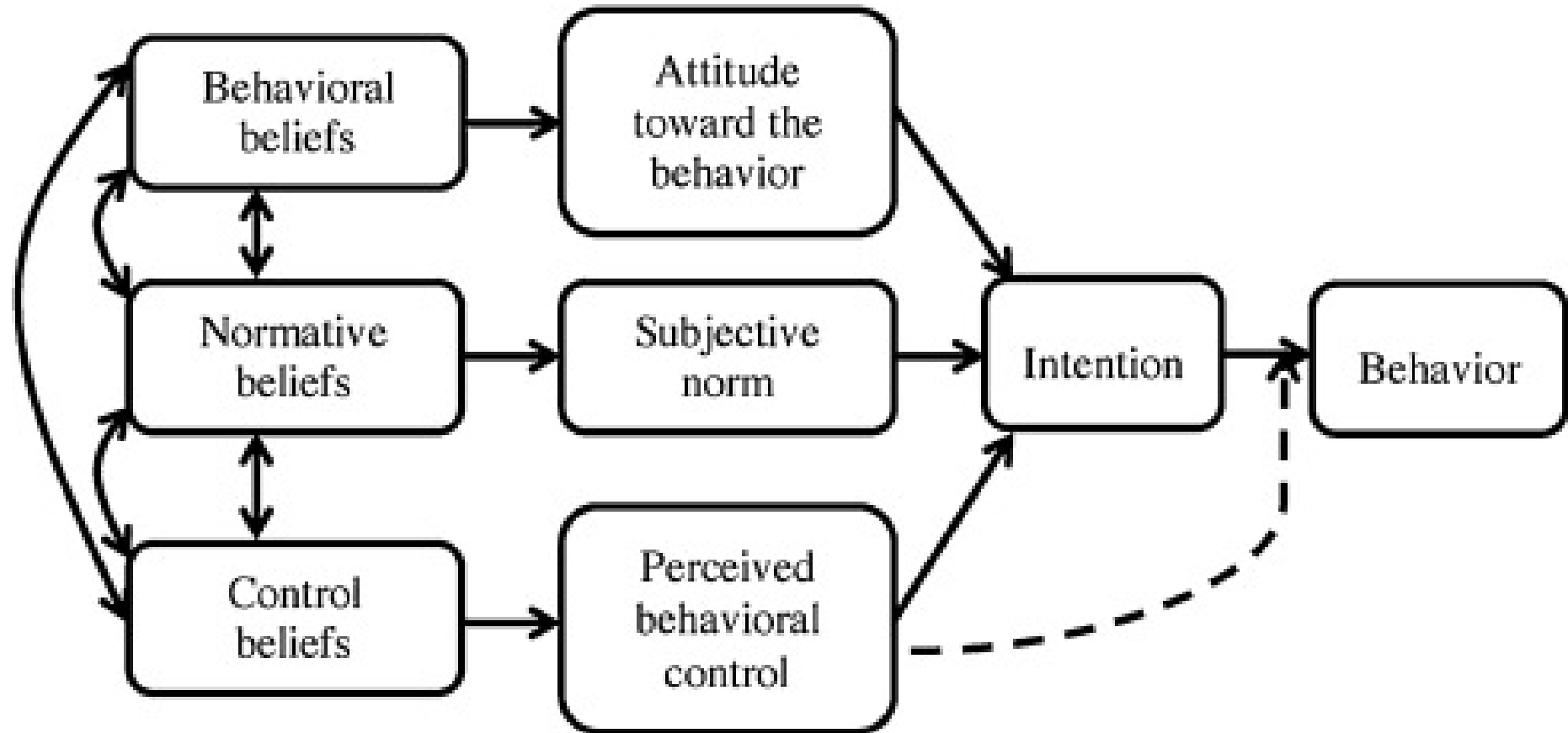
Janz & Becker (1984)

Review of nearly 50 studies health behaviours significantly associated with susceptibility in 82% of studies perceived severity in 65% of studies. Perceived benefits in 81% of studies Perceived costs in 100%

Limitations of HBM

- Some of the constructs are not clearly defined and have been operationalised in different ways
- The nature of the relationships between constructs is vague
- Doesn't provide any indication of how you might go about changing the variables
- A number of variables thought to be important in changing behaviours are missing e.g. social support, self efficacy, habits and intention
- Static model of health

Theory of Planned Behaviour (TPB)



Azjen (1991, 2005)

Theory of Planned Behaviour

Evidence to support TPB

McEachan et al. (2011)

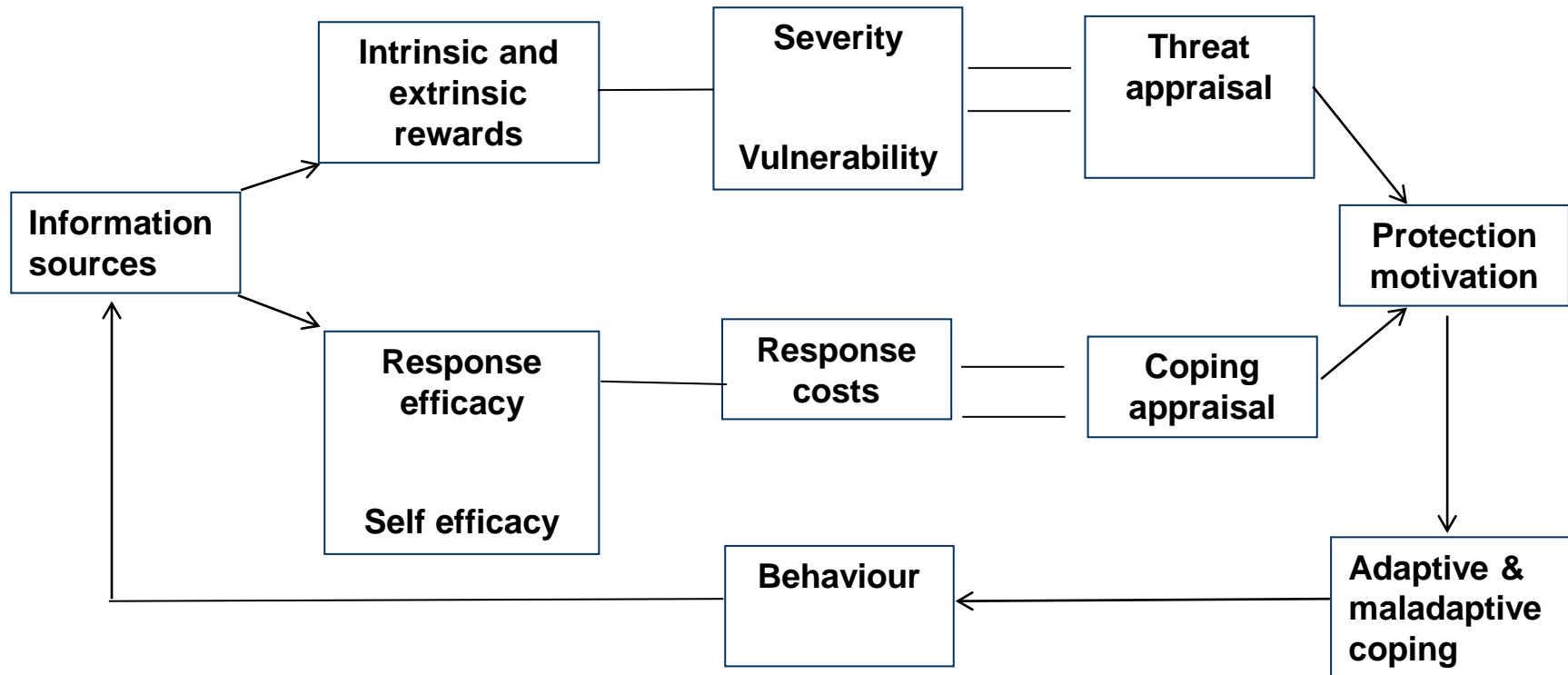
Meta analysis of over 200 studies using the TPB to predict health related actions. Taken together, attitudes, subjective norms, and perceived behavioural control accounted for 44.3% of variance in intention.

A review of the TPB's application to health behaviours found that components of the TPB explain on average 41 per cent of the variance in intention.

Limitations of TPB

- Fails to highlight how you might go about influencing key constructs
- Intention – behaviour gap: those who intend to perform a behaviour but fail to do so which suggests there are important influences on behaviour omitted
- There is evidence of changes in behaviour without changing intentions or perceived behavioural control

Protection Motivation Theory (PMT)



Rogers (1975)

[https://www.youtube.com/watch?v=](https://www.youtube.com/watch?v=iroty5zw0Vw)
[iroty5zw0Vw](https://www.youtube.com/watch?v=iroty5zw0Vw)

Protection Motivation Theory

Evidence to support PMT

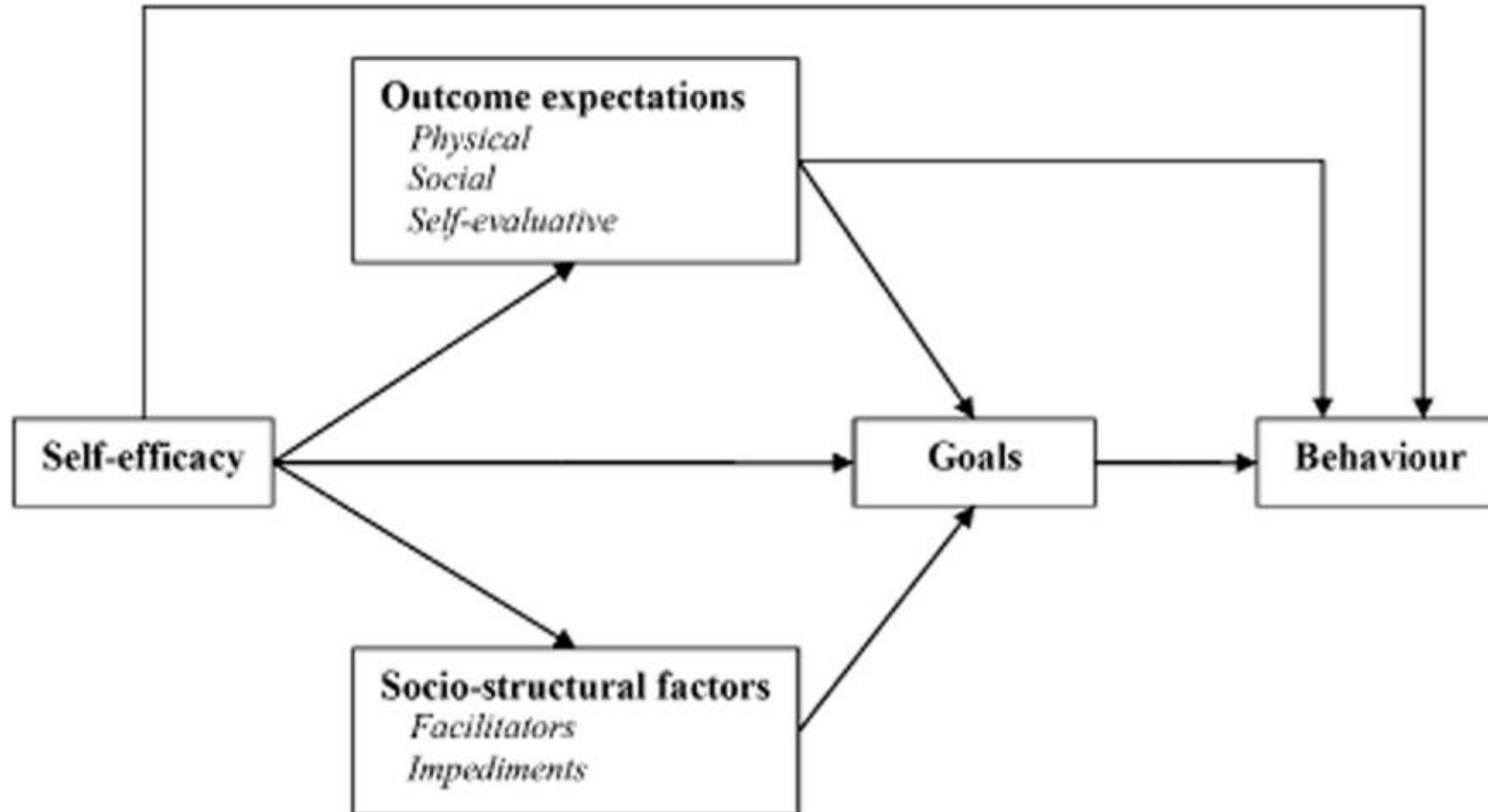
Floyd et al. 2000 and Milne et al. 2000

- Meta analyses generally provide support for predictive utility of the constructs – coping appraisal variables (particularly self efficacy) being better predictors than threat appraisal variables
- Studies show that increasing self efficacy may have largest effect on intention
- Like TPB, PMT is better at predicting intention than behaviour

Limitations of PMT

- Clarity of constructs
- No direct link between self efficacy and behaviour
- Role of past behaviour
- Generalisability

Social Cognitive Theory (SCT)



Social Cognitive Theory (SCT)

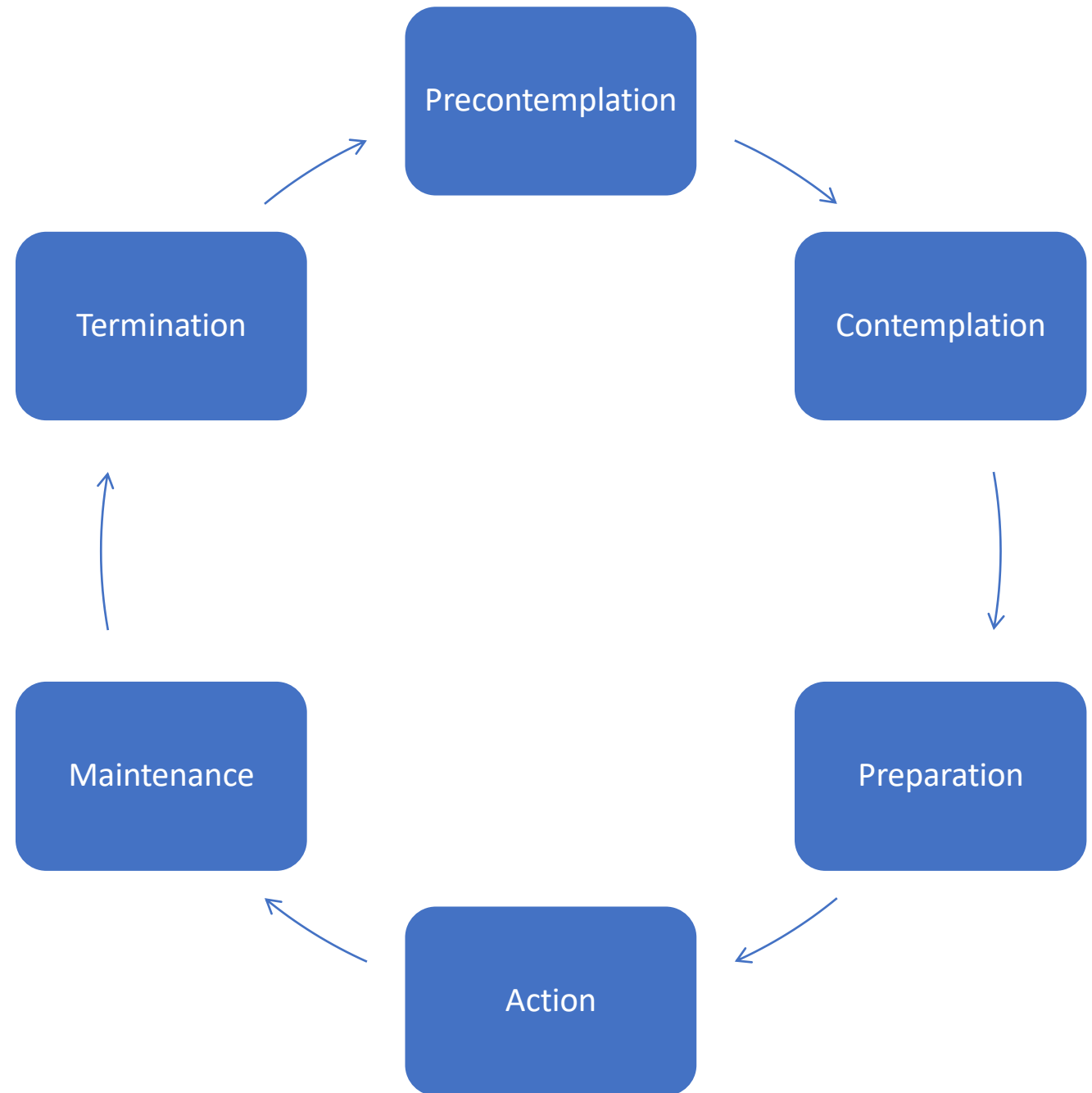
Evidence to support SCT

- There is substantial evidence to support a link between self efficacy and behaviour change.
- There is evidence to suggest that verbal persuasion and activities aimed at promoting experiences of success are effective in increasing self efficacy
- Accounted for 31% of the variance in physical activity (Young et al., 2014)

Limitations of SCT

- Assumes all behaviour is under explicit conscious control – behaviour mediated by goals, self efficacy, and outcome expectancies
- Fails to account for research that suggests much of our behaviour is habitual performed outside conscious awareness
- Role of social norms is not explicitly addressed; research suggests that social norms can have a powerful influence on behaviour

Transtheoretical Model (stages of change)



Prochaska & DiClemente (1983)

Transtheoretical Model

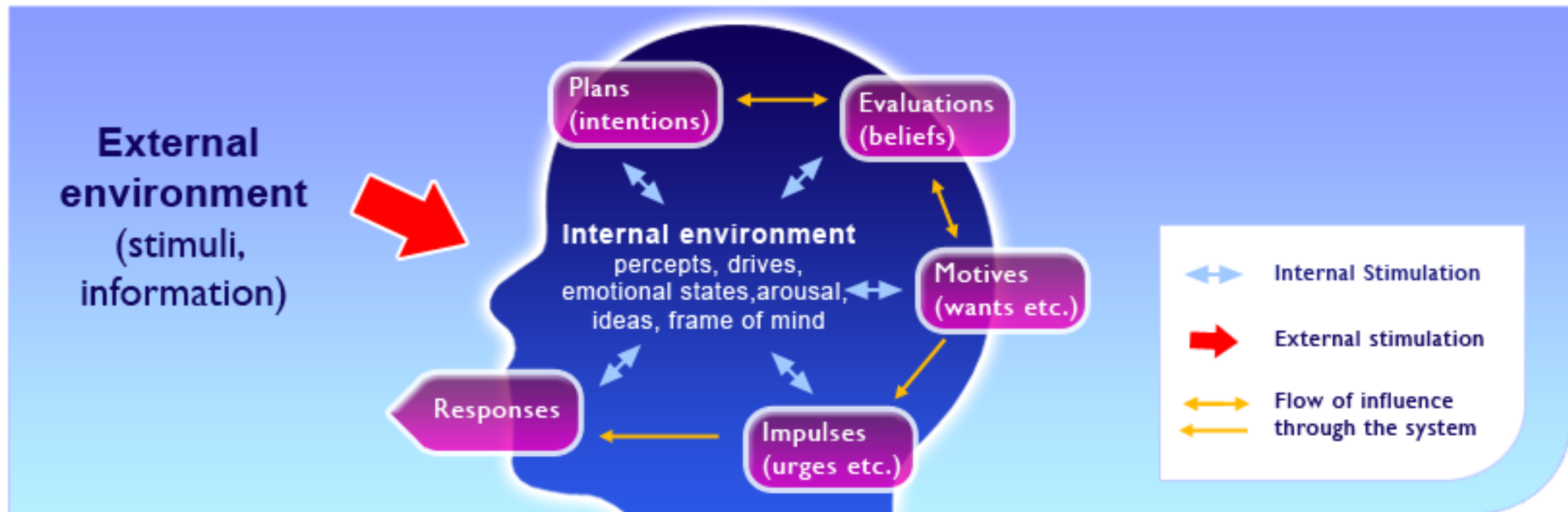
Evidence in support

- Dijkstra et al. (2006) found that more individuals in a stage matched intervention progressed (45%) compared to those in the mismatched condition (26%)
- Dijkstra et al. (1998) found no significant differences in stage progression between those had received information that was matched to their stage and those who had not
- Generally studies provide little support for the transtheoretical model

Limitations

- Limited evidence base; many experimental test have failed to support the model
- It doesn't specify how variables are weighted against each other or whether they interact
- Cant account for the fact that people often decide to change their behaviour in the absence of any planning

PRIME Theory of Motivation



West & Brown(2013)

<http://www.primetheory.com/summary-prime-motivation.php>

PRIME Theory: Implications for understanding and treating addiction

According to PRIME theory, addiction occurs due to abnormalities in the motivational system. These abnormalities fall into one of three types:

1. Abnormalities in social or physical environment that lead to strong pressure to engage in the activity
2. Abnormalities in the motivational systems of the person that mean they are more susceptible to addiction
3. Abnormalities in the motivational system that arise because of the addictive behaviour

Habits

Habits are learned sequences of acts that have become automatic responses to specific cues and are functional in obtaining certain goals or end states.

Verplanken & Aarts(1999)

Addressing habits

- System 1 and system 2 thinking
- Implementation intentions
- Nudge theory

Implementation Intentions

- A type of action plan in which a person specifies when, where and how they will perform a particular behaviour
- Describe a specific action that will help one achieve the desired outcome
- A goal: *I am going to get fitter*
- An implementation intention: *If it is a weekday morning, and I have just got out of bed, then I will do 10 minutes of yoga*

Implementation Intentions

Evidence:

- Shown to be helpful for achieving approach related health goals
- Some support in achievement of avoidance related health goals but evidence more mixed
- Support change by increasing cognitive accessibility of relevant situational cues and increasing strength of relationship between the cue and the response in the persons' mind

Types of implementation intention interventions

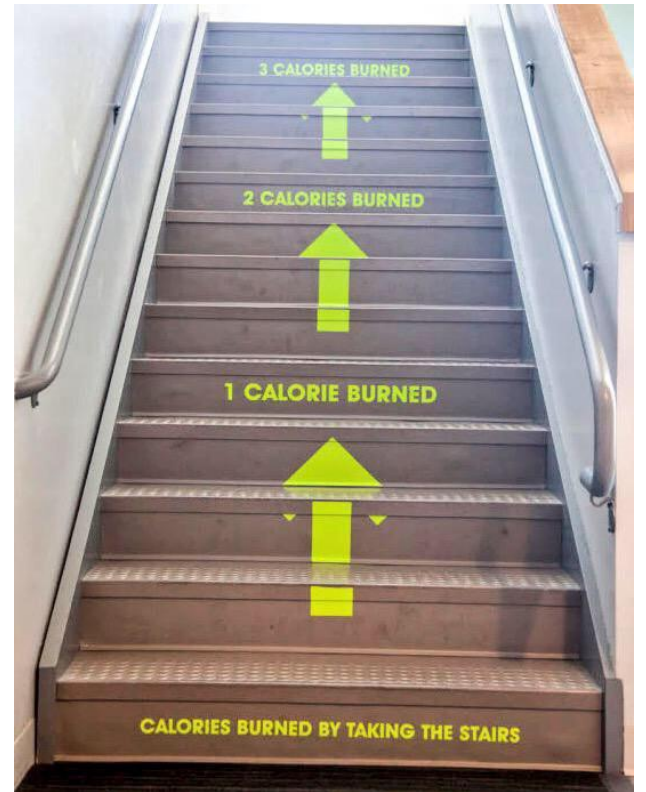
- Volitional help sheets
- Action planning
- Digital reminders
- With social cognition theories

Nudge theory

- A nudge is defined as any aspect of the choice architecture that alters peoples' behaviour in a predictable way without forbidding any options or significantly changing their economic incentives.
- Key feature of a nudge is that whilst it makes a particular choice more likely, the individual still feels at liberty to chose something different.
- Form of 'libertarian paternalism'
- Argument that it lacks clarity and has been inconsistently applied hindering attempts to test its effectiveness



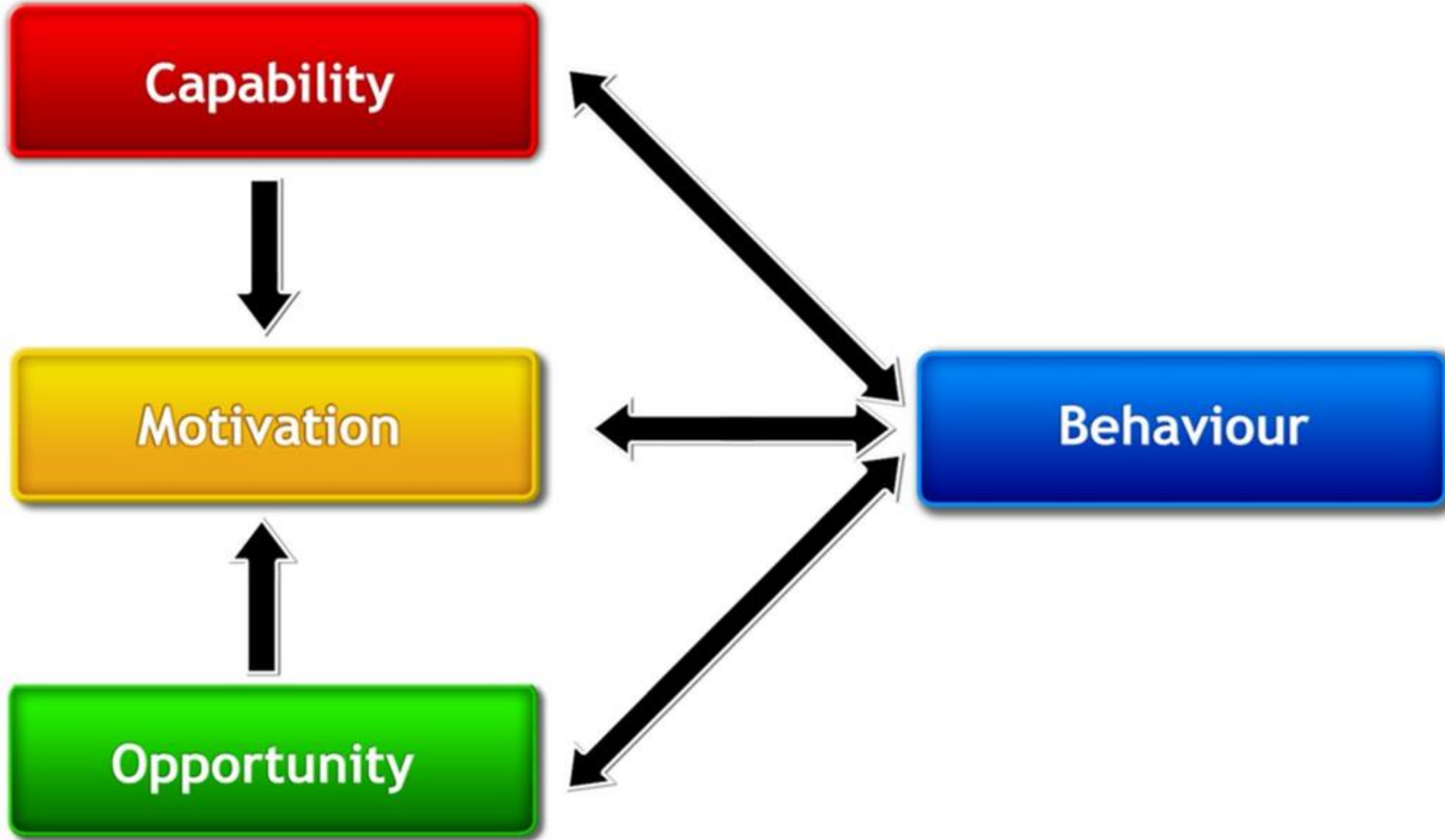
Nudge theory



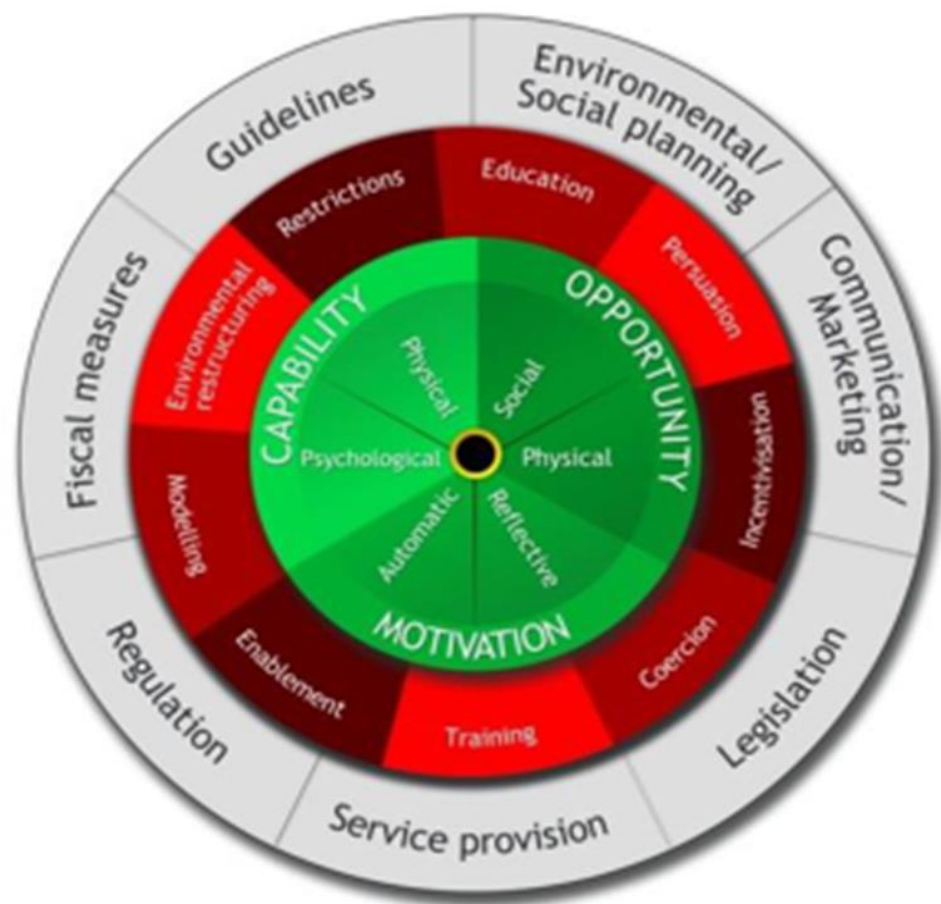
Com B model and the Behaviour Change Wheel

- Systematic review identified 19 frameworks of behaviour change
- None of the frameworks were comprehensive and all excluded potential influences on behaviour
- Led to the development of the COM B model and the Behaviour Change Wheel

COM B
Model



Behaviour Change Wheel



Behaviour change intervention design

Stage 1: Understand the behaviour

- Define the problem in behavioural terms
- Select target behaviour
- Specify the target behaviour
- Identify what needs to change

Stage 2: Identify intervention options

- Identify intervention functions
- Identify policy categories

Stage 3: Identify content and implementation options

- Identify behaviour change techniques
- Identify mode of delivery

Defining the problem in behavioural terms

- May be about stopping or starting a behaviour or increasing/decreasing the frequency, duration and/intensity
- It may be a familiar or novel behaviour
- We need to define it in its context – what needs to change, for whom, where, when, why and for how long
- Sometimes the target behaviour is clear and sometimes its less obvious

Common mistakes in defining behaviours

- Mistaking outcomes for behaviours
- Choosing behaviours that are attractive to target audience but have little impact on the problem
- Setting unachievable behavioural goals rather than small steps
- Focusing solely on those whose behaviour we want to change and not considering others who may influence them

Prioritising behaviours

- How much of an impact will changing this behaviour have on the desired outcome?
- How likely is it that the behaviour can be changed?
- How likely is it that the behaviour will have a positive or negative impact on other, related behaviours?
- How likely are young people to accept this?
- How easy will it be to measure the behaviour?

Identify what needs to change



Capability

Physical capability: physical skills, strength or stamina

Psychological capability: knowledge, psychological skills



Opportunity

Physical opportunity: Time, resources afforded by the environment

Social opportunity time: Social norms, social cues



Motivation

Reflective motivation: reflective processes such as making plans, setting goals, weighing up the pro's and cons

Automatic motivation: Automatic processes involving emotions, habit

Intervention functions	
Education	Increasing knowledge or understanding
Persuasion	Using communication to induce positive or negative feelings to stimulate action
Incentivisation	Creating an expectation of reward
Coercion	Creating an expectation of punishment or cost
Training	Imparting skills
Restriction	Using rules to reduce the opportunity to engage in the behaviour (or to increase behaviour by reducing opportunity to engage in competing behaviours)
Environmental restructuring	Changing the physical or social context
Modelling	Provide an example for people to aspire to or emulate
Enablement	Increasing means or reducing barriers to increase capability (beyond education or training) or opportunity (beyond environmental restructuring)

Policy Categories

Communications/marketing	Using print, electronic, telephonic or broadcast media
Guidelines	Creating documents that recommend or mandate practice
Fiscal measures	Using the tax system to reduce or increase the financial cost
Regulation	Establishing rules or principles of behaviour/practice
Legislation	Making or changing laws
Environmental/social planning	Designing and/or controlling the physical or social environment
Service provision	Delivering a service

APEASE criteria

- Affordable – Can we afford to target that barrier/facilitator and associated intervention?
- Practical – Can we target that barrier/facilitator as part of a trial, with current resources? Is it practical and feasible?
- Effectiveness – How far will it reach the target group and how large an effect will it have?
- Acceptable – Is it acceptable to target this barrier/ facilitator and associated intervention– includes target group as well as stakeholders, intervention delivery team etc
- Side-effects – What are the chances it will lead to unintended negative consequences?
- Equity – How far will it increase or decrease differences between different population groups?

Behaviour Change Technique Taxonomy

- Behaviour Change Techniques (BCTs) are the smallest components of behaviour change interventions that, on their own, in favourable circumstances, can bring about change
- Michie et al (2013) developed a BCT taxonomy consisting of 93 distinct BCTs e.g.

BCT: Goal Setting

Definition: Set or agree on a goal defined in terms of the behaviour to be achieved

Example: Set the goal of eating 5 pieces of fruit per day as specified in public health guidelines

 Sources of behaviour

 TDF Domains

- Soc - Social influences
- Env - Environmental Context and Resources
- Id - Social/Professional Role and Identity
- Bel Cap - Beliefs about Capabilities
- Opt - Optimism
- Int - Intentions
- Goals - Goals
- Bel Cons - Beliefs about Consequences
- Reinf - Reinforcement
- Em - Emotion
- Know - Knowledge
- Cog - Cognitive and interpersonal skills
- Mem - Memory, Attention and Decision Processes
- Beh Reg - Behavioural Regulation
- Phys - Physical skills



Theoretical
Domains
Framework (TDF)

Population level behaviour change interventions

- COM B model and BCW apply at any level from individuals to groups, sub populations and populations
- If seeking to change the behaviour of populations, you can specify that behaviour in population terms e.g. proportion who smoke cigarettes or drink above the recommended limit
- If seeking to change behaviours of individuals or groups you can specify the behaviour at that level e.g. increasing the number of minutes of physical activity per week
- Advances in technology have enabled features of individual level interventions to be applied to whole populations

Case study

- Objective was to utilise behavioural science and theory to increase vaccine uptake in young people aged 18-25 of Pakistani heritage
- Involved engaging with stakeholders to understand influences on behaviour using the COM B model
- Co-produced and tested messages to assess their likely effectiveness, and to explore other potential barriers to uptake
- Co-produced a plan to implement the messages and other proposed intervention(s) with the relevant communities and stakeholders
- Disseminated the findings to stakeholders and explore key learnings for communications and messaging

Barriers and facilitators to vaccine uptake

Participants reported wanting to receive the COVID-19 vaccine due to:

- An increase in COVID-19 variants
- Having family and friends that have had the vaccine
- Knowing people in vulnerable groups and wanting to protect other people and communities
- Working with children or vulnerable groups
- Wanting to get back to normality
- Wanting to have opportunities to travel and attend other events (e.g., go out to restaurants with family)

Participants reported potential barriers to receiving the COVID-19 vaccine to be:

- Knowing when they can receive a vaccine – reminders needed
- Having had COVID-19, therefore they already have antibodies & don't need a vaccine
- Having not had COVID-19 yet, so it's not going to impact & so there's no need for them to get vaccinated
- Lack of knowledge/understanding about the development of the vaccine & concern about the speed at which it has been developed.
- Concern there's a lack of transparency about how the vaccine has been developed
- Concern about short-term side-effects, especially from AstraZeneca vaccine
- Need to be able to get a vaccine at a convenient time (e.g., outside of work/university time) and at an accessible location (especially for those that don't drive)
- Fear of needles
- Having the perception that young people are at a lower risk of COVID-19

Factors to be addressed in messaging

- The myth that the COVID-19 vaccination could adversely affects women's future fertility.
- The belief that young people who are fit and healthy don't need the COVID-19 vaccine.
- The value of the COVID-19 vaccine for friends, family, and the young person themselves.
- The value of the COVID-19 vaccine for friends, family, and the young person themselves, whilst also acknowledging the difficulties experienced by young Pakistani people during the pandemic.



As young women we care about our future and the families we want to have one day. The COVID Vaccine is safe for us.

It will not affect our ability to have children. There is no evidence of this, nor that other similar vaccines have affected fertility in the past. The best way to protect our health and our future is to get the vaccine.

**For our families, for our friends, for us:
Get the COVID Vaccine**



The COVID Vaccine is important for all of us.

The virus that causes COVID can infect us, no matter how young, fit and healthy we are.

Vaccination is the only way to protect ourselves and our loved ones from infection so we can get life going again.

Do your part - You're essential



For our families, for our friends, for us.

So we can get life going again

**Do your part - You're essential
Get the COVID Vaccine**



It's been difficult for us. Our community has been badly affected. We've missed out on so much.

But we can really make a difference

**For our families, for our friends, for us
So we can have a better future
Get the COVID Vaccine**

Testing the messages

- We trained three community researchers to undertake qualitative online interviews with young people (18 – 25 years) of Pakistani heritage from Bradford
- The community researchers have undertaken 73 interviews

The interviews explored:

- People's understanding and experiences of COVID-19 and vaccinations
- People's opinions about four new messages to promote uptake of the COVID-19 vaccine

Findings from the interviews

- All four of the messages were perceived to be effective by a majority of participants who were previously unsure about having the vaccine.
- The vast majority of participants (> 91 %) who previously intended not to have the vaccine perceived the messages to either be effective or to have no effect.
- Participants reported a range of capability, opportunity, and motivational barriers and facilitators to receiving the vaccine
- The project was successful in identifying the types of message content and imagery that would be most effective in helping persuade people who are more hesitant to get the vaccine when offered, as well preferred message source and mode of delivery

Recommendations

- One message wont work for everyone
- Messages need to focus on key motivations for young people to get vaccinated
- Evidence based approach to myth busting
- Messages target multiple communities of young people, including but not exclusively those of Pakistani heritage
- Targeted messages might be appropriate within the context of a series of messages for different groups/communities in Bradford which would then avoid the Pakistani community feeling particularly targeted or blamed

How would you go about developing an Active Travel strategy informed by behaviour change models and theories?

British Psychological Society Roadmaps

- BPS published six new guidance documents to advise health officials how to use psychology to support people to adopt healthy behaviours during the Covid-19 pandemic using the COM B model
- The guidance focuses on addressing the following key health behaviours:

Physical activity	Sedentary behaviour
Eating behaviour	Stopping smoking
Alcohol consumption	Sleep hygiene

<https://www.bps.org.uk/news-and-policy/new-bps-guidance-help-experts-support-people-look-after-their-health-during-pandemic>

Behaviour Change Guide for Local Government



Public Health
England

Protecting and improving the nation's health

Achieving behaviour change

A guide for national government

Summary

- Behaviour change needs to be studied as a science using the available theory and evidence
- Behaviour change models and theories can support in developing effective interventions BUT is dependant on the use of an appropriate theory and robust application of this
- There are lots of resources available and an increase in behavioural scientists working within/alongside public health teams

Resources

- https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/875385/PHEBI_Achieving_Behaviour_Change_Local_Government.pdf
- <https://www.gov.uk/government/publications/improving-peoples-health-applying-behavioural-and-social-sciences>
- <https://www.bsphn.org.uk>
- <https://www.bct-taxonomy.com/>
- <https://www.bsphn.org.uk/784/Tools-Resources-for-Professionals>