



# Behaviour change in cystic fibrosis and exercise

Improving adherence to exercise

Dr Sarah Denford

With thanks to the Cystic Fibrosis Trust



# Welcome and Introductions



# Aims of this session

- Help you identify potential barriers to physical activity in CF
- Describe 'step-change' models applicable to changing behaviours
- Gain skills and knowledge to apply behaviour change models in clinic



# Behaviour patterns are important to health

- UK Population study of 20,000 people
  - Not smoking
  - Being physically active
  - Drinking moderately
  - Eating 5 portions of fruit and veg per day
- Eleven years later: those engaging in none of the four behaviours were four times more likely to have died than those engaging in all four

Khaw et al 2008



# It is possible to change behaviour... but not easy

- Systematic review and meta-analysis of 1,011 evaluations
- Interventions targeting
  - Healthy eating, physical activity, sexual behaviour, addictive behavior, stress management, uptake of screening, and use of health services
- Interventions were effective – although effect size vary

Johnson et al. (2010, *Am J Pub Hlth*)



# Because despite recommendations...



I know I should really but...

My gran never did any exercise and she lived to be 402

I'm too unfit to join a gym

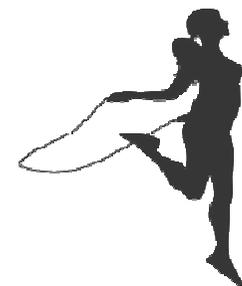
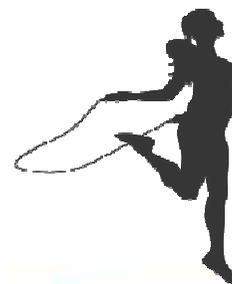
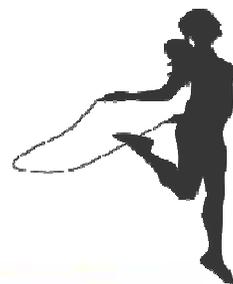
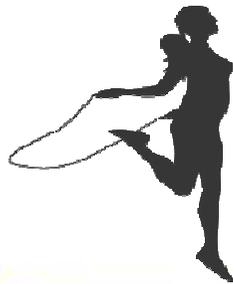
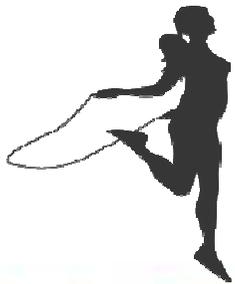
I haven't got time for that...

I'm going to start on Monday...



# Specifying target

- Who needs to do
  - What?
  - When?
  - Where?
  - How?



# Behaviour is a complex series of actions

- Understand exactly what it is that we want to change - behaviour is rarely a “one-time” action
  - E.g., “Healthy eating” involves buying healthy food, preparing and cooking healthy food, eating the healthy food, not snacking etc.
- Behaviour is often dependent on or influenced by other behaviours (own and others)
- Intervention should target the behaviour and sub-behaviours



# Task 1

- What sub-behaviours need to be considered when thinking about physical activity?
  - Who, what, when, where, how...
- Would any of the sub-behaviours require additional intervention?
- Feedback to the rest of the group





- Who
  - Family, friends, self...
- What
  - Offer support, join a gym, walk the dog, buy equipment, plan nutritional intake
- Where
  - Home, work, gym
- When
  - Before work, lunch time..
- How
  - Find a time to exercise / be active, set an alarm to get up early, incorporate exercise into routine



# Things to consider when changing behaviour

- The nature of the behaviour
- The context
- The scope of the intervention
- Modifiable regulatory mechanisms
- Behaviour change techniques



# The nature of physical activity behaviour

- Physical activity
  - requires energisation, “push”
  - begin doing things
  - create impulses
  - respond to cues
- Healthy eating
  - requires self-control, “pull”
  - avoid/stop doing things
  - resist impulses
  - **not** respond to cues



# Socio-Ecological Model



# Task 2

- What factors influence participation in physical activity?
  - Think about biological
  - Demographic
  - Psychological
  - Environmental
  - Social
  - Other
- Feedback to the rest of the group



# Biological

- Age
- Gender
- Physical fitness
- CF factors: health status / lung function / exercise tolerance / nutritional status / disease burden etc



# Demographics

- Social Economic Status
- Ethnicity
- Education



[dreamstime.com](http://dreamstime.com)



[dreamstime.com](http://dreamstime.com)



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[dreamstime.com](http://dreamstime.com)



# Psychological facilitators

- Choice of activity
- Interest and enjoyment from physical activity
- Feelings of competence, success and achievement
- A positive attitude towards physical activity
- Belief in one's ability to be physically active (self-efficacy)
- Opportunities to challenge oneself, set goals and to improve (self-regulation)



# Psychological barriers

- Perceived lack of time
- Lack of interest
- The effort required
- Self-consciousness
- Issues of body image and appearance (particularly adolescent girls)



# Environmental factors

- Access to facilities
- Provision of safe walking / cycling routes
- Perception of neighbourhood



# Social factors

- Family and clinical support
- Peer support / pressure



# Any others?

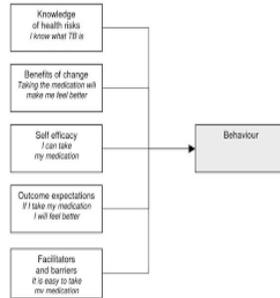


# Theories of behaviour change

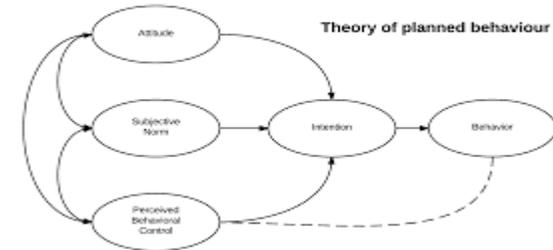
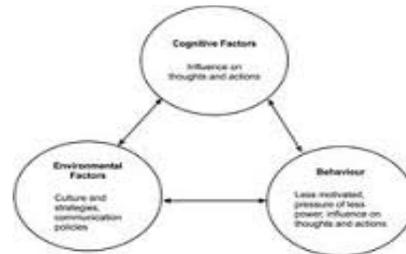
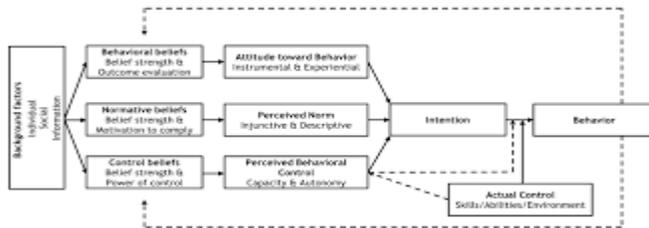
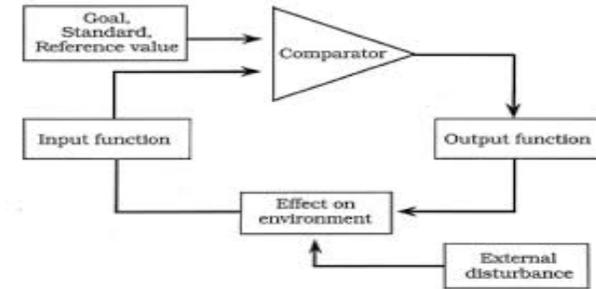
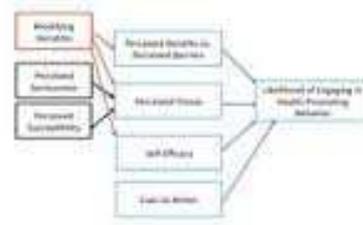
## Trans-theoretical Model of Change



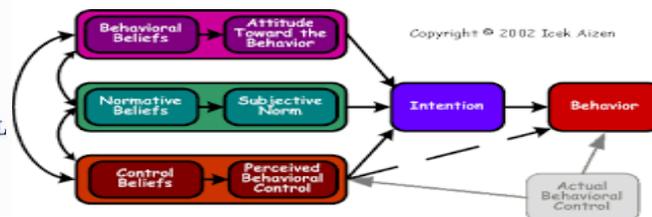
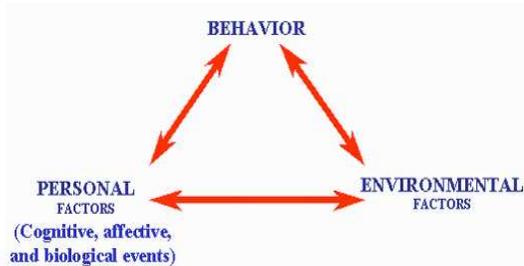
Adapted from Prochaska and Di Clemente's cycle of change model.



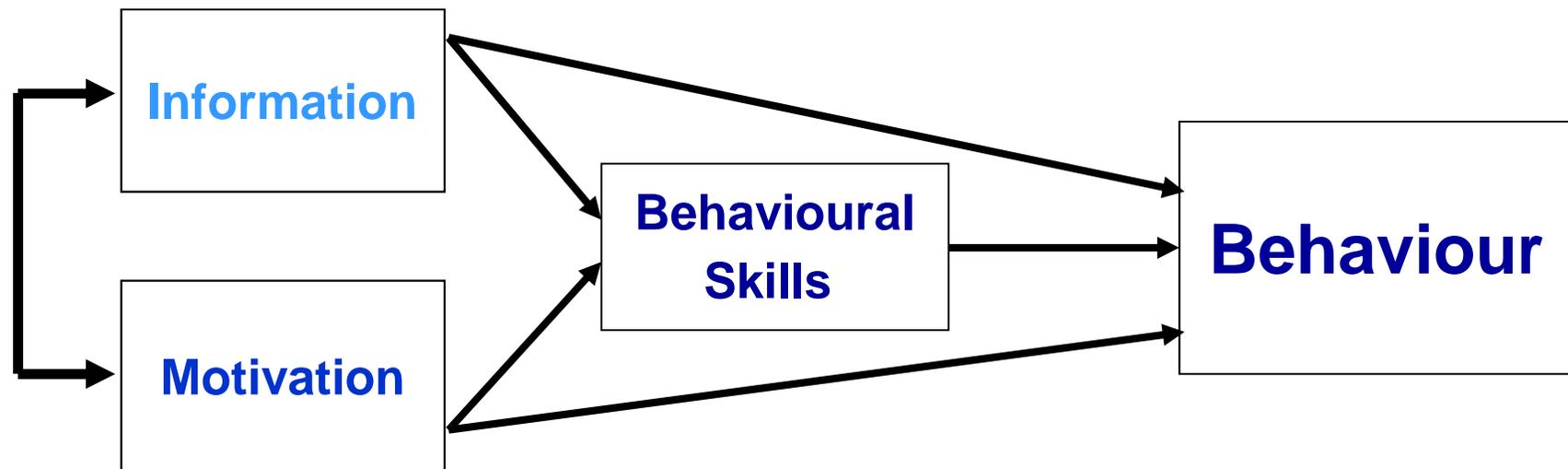
## The Health Belief Model



## Theory of planned behaviour



# A framework for intervention development



Fisher, J. D. & Fisher, W. A. (1992). Changing AIDS-risk behavior. *Psychological Bulletin*, 111, 455-474



# Information

How many steps should I take a day?

What do the results of my fitness test mean?

What is the best way to build muscle?

What is the difference between exercise and physical activity?

What should I eat when I exercise?

What is the difference between HIIT and interval training?

What is the best way to get fit?

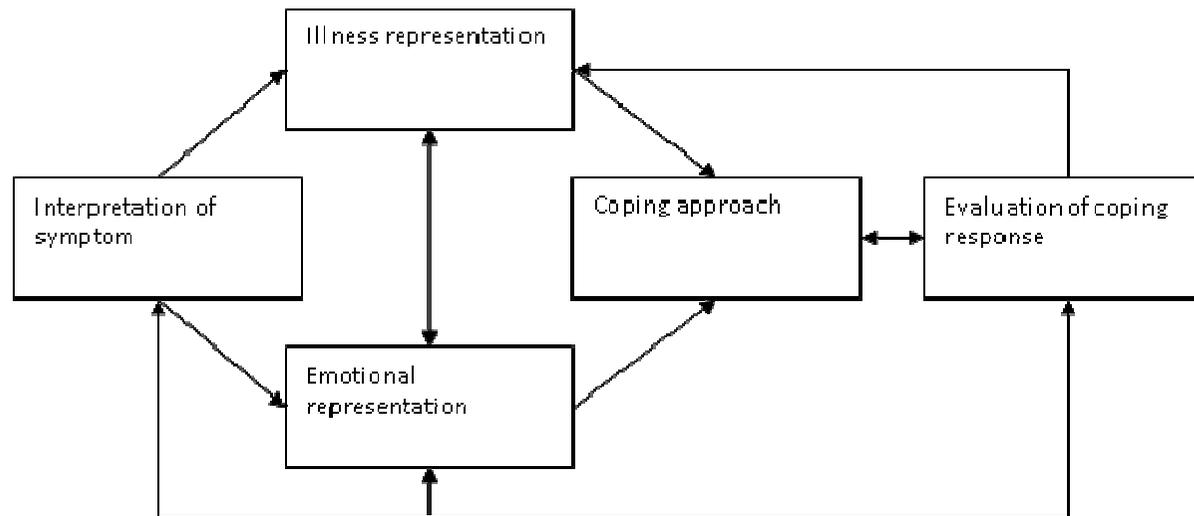
How often should I exercise?

How out of breath should I be?

What sort of exercise should I do?



# Illness understanding – The Common-Sense Model of Self-Regulation



Leventhal et al (2003) The common-sense model of self-regulation of health and illness.



# Illness representations

- Identity: The label the individual places on the problem and the symptoms associated with it
- Cause: Personal ideas about the aetiology
- Consequences: Expected effects and outcomes
- Controllability/Cure: How one controls or recovers from the illness
- Timeline: How long it will last



# Patient's understanding of asthma

- Qualitative study
- Participants included nine nurses and twenty one patients
- Data collected at three time points
  - Two taped and transcribed consultations
  - Semi structured interviews with patients and nurses post intervention
- Data analysed using framework analysis



# Identity

*“I suppose to some extent that I haven’t got it, but I’m still not convinced, you see, my perception of asthma is that sort of the situation where as a child, you know a young lad who probably didn’t have a cold or anything, suddenly couldn’t breathe, probably due to some fright or other”*



# Cause of condition or symptoms

*“Nurse: So what sort of things trigger your asthma?”*

*“Patient: Exercise does definitely”*

*“Patient: I know it’s not an excuse, I have taken on board everything that you have said to me, but the smoking never causes me to be, you know, I never have a cigarette and think ‘oh god I shouldn’t have had that because I’m short of breath’, it doesn’t have that sort of effect on me”*



# Consequences

*“Nurse: Are there any particular concerns you have about your asthma?”*

*“Patient: No none at all. It’s something I have had all my life. It’s never bothered me. I’ve never, apart from being in hospital from it, that’s the only time it’s ever bothered me”*



# Cure / Control

*“I don’t think you can actually ever be properly [in control of it], do you know what I mean? You kind of like tell yourself that you’re not going to have a flare up, but I don’t think it’s like our own fault that it happens. It’s just one of those things, if you’re going to get ill you’re going to get ill”*



# Timeline

*“P: I do take my inhaler while I’ve got asthma.*

*N: yes, but in order to keep your lungs healthy,  
you have to keep using your brown inhaler.*

*P: Forever?!”*

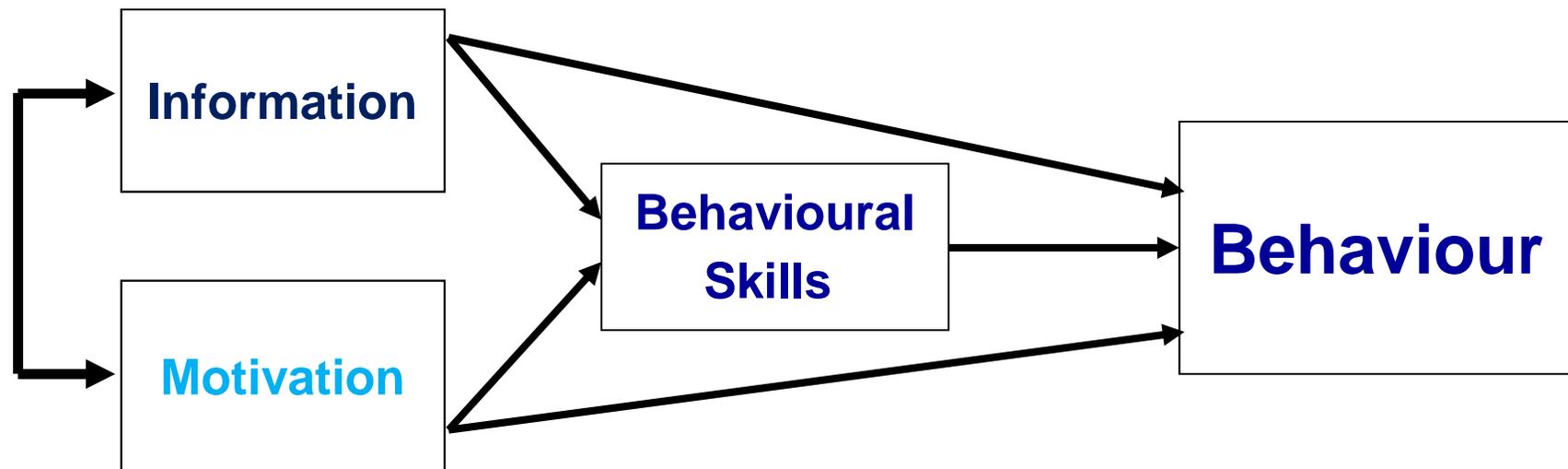


# Information: Summary

- Patients with CF need to be sufficiently informed about:
  - Physical activity,
  - How to be physically active,
  - The relationship between CF and physical activity in relation to:
    - Identity
    - Cause
    - Consequence
    - Controllability
    - Timeline



# Information, motivation, behavioural skills model



Fisher, J. D. & Fisher, W. A. (1992). Changing AIDS-risk behavior. *Psychological Bulletin*, 111, 455-474





## Task 3

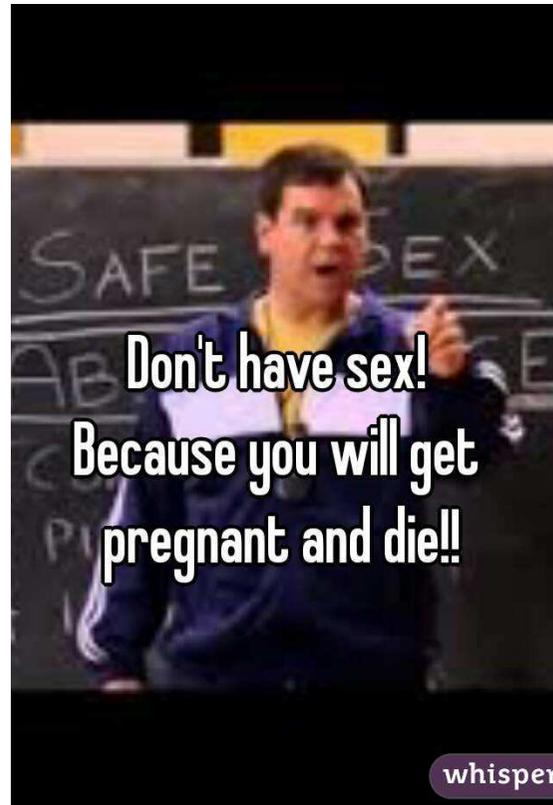
- How do we build motivation?



<http://www.bbc.co.uk/news/uk-wales-39057049>



# Fear?!



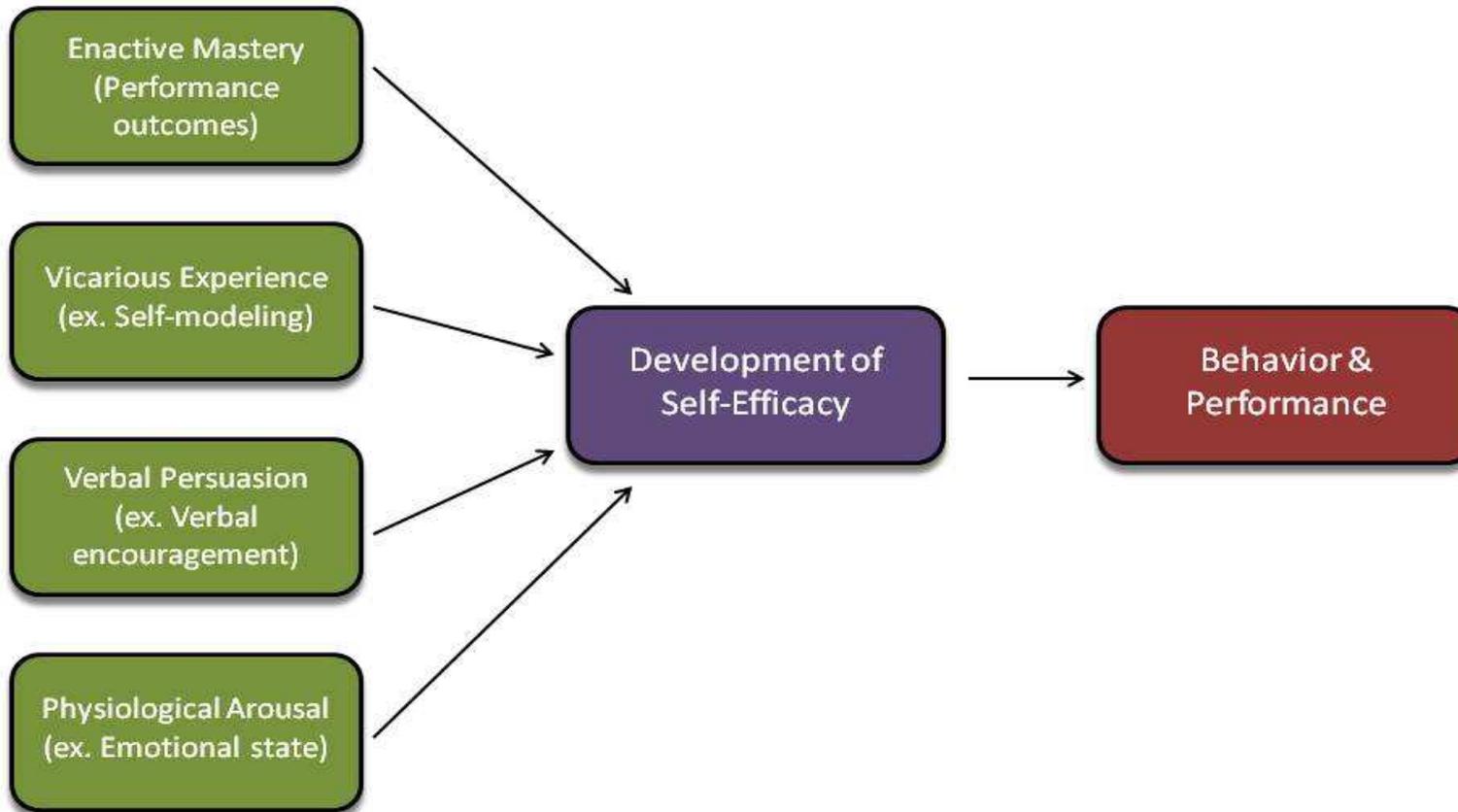
# Modifiable determinants of motivation

- More likely to intend to perform a behaviour if you...
  - Believe the advantages outweigh the disadvantages
  - Anticipate a positive emotional reaction to the behaviour
  - Feel social pressure (normative influences)
  - Perceive behaviour to be consistent with self image
  - Have high self efficacy

Fishbein et al (2001) Handbook of Health Psychology



# Sources of Self-Efficacy



To be successful, we need to cultivate a desire *among patients* to be active



# “Selling” physical activity to patients

1. Focus on the patient’s goals – which may not be medical
2. “Framing” physical activity as fun v exercise (internal v external motivation)
3. Focus on observable and immediate benefits of exercise
4. Foster positive affect
5. Prescribe intensity to match enjoyment



# Choose to M.O.V.E.!

**M**ove to **O**ptimize your **V**itality and **E**njoyment!

NAME: \_\_\_\_\_ DATE: \_\_\_\_\_

What positive experiences do you want from being physically active?  
(Check your top 2)

- |   |   |   |
|---|---|---|
| <input type="checkbox"/> <b>Vitality</b>    | <input type="checkbox"/> <b>Well-being</b>      | <input type="checkbox"/> <b>Connection</b>    |
| <input type="checkbox"/> <b>Less Stress</b> | <input type="checkbox"/> <b>Better mood</b>     | <input type="checkbox"/> <b>Clear my mind</b> |
| <input type="checkbox"/> <b>Stronger</b>    | <input type="checkbox"/> <b>Feel in control</b> | <input type="checkbox"/> <b>Other: _____</b>  |
| <input type="checkbox"/> <b>Relaxed</b>     | <input type="checkbox"/> <b>Enjoyment/fun</b>   | _____   |
| <input type="checkbox"/> <b>Joyful</b>      | <input type="checkbox"/> <b>Less anxious</b>    | _____   |

What type of movement is most likely to bring these experiences to you? \_\_\_\_\_

What would a realistic goal be for starting this week? \_\_\_\_\_

How can I support you in learning how to move more? \_\_\_\_\_

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# Task 4

- How do we make exercise fun?

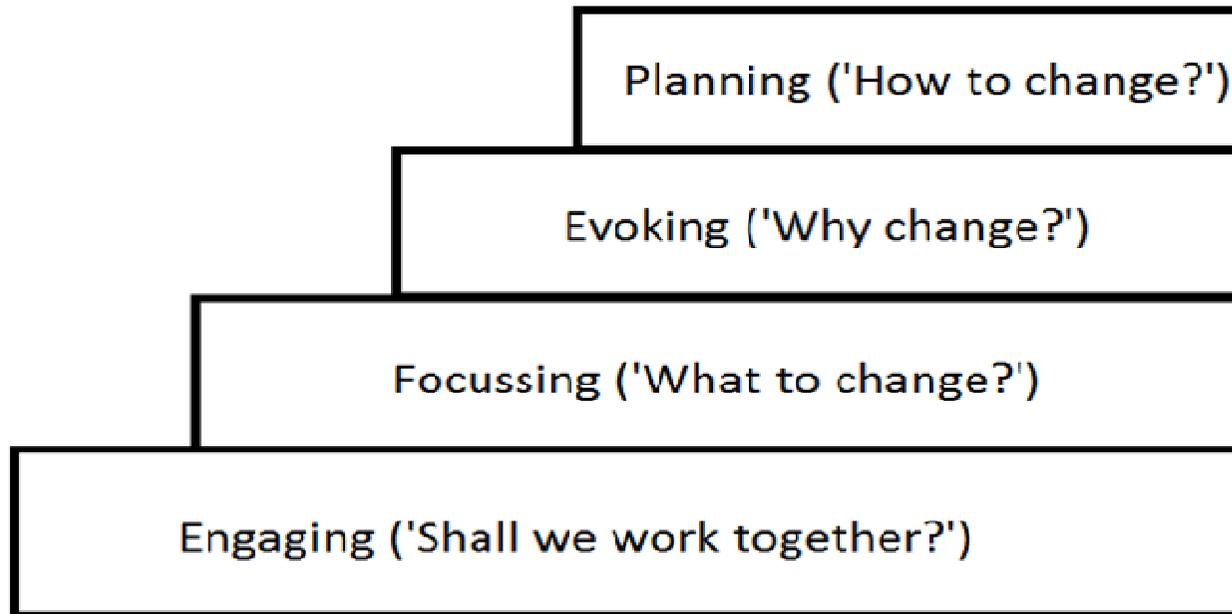


# How do we make exercise fun?

- Add friends
- Competitions
- Fitness monitors
- Fitness apps
- Music
- Try something new
- Achievement / goal setting



# Motivational interviewing



Miller and Rollnick 2012 Motivational interviewing: Helping people change



# Motivational interviewing

1. Motivation to change must be from the patient, not imposed by professionals;
2. The role of the professional is to help the patient to resolve conflict; not to teach behavioural strategies
3. interactions should be viewed as partnerships as opposed to professional / patient roles.
4. The patient has to articulate and resolve any conflict inherent in changing their behaviour
5. Persuasion is not an element of MI (righting reflex)
6. Aggression, confrontation, and argumentation are avoided
7. Readiness to change depends on the interactions between the patient and professional; not a static trait from within the patient



# READS Principles of Motivational Interviewing

- Roll with resistance
- Express empathy
- Avoid argumentation
- Develop discrepancy
- Support self-efficacy



# Motivational Interviewing

- Asking open questions
- Affirming (recognising and commenting on the patient's strengths and abilities)
- Reflective listening (summarising what the patient has told you in your own words, in the form of a statement rather than a question that encourages them to continue talking)
- Summarising (giving a collection of reflections, allowing you to indicate what you think were the most important headlines of what the patient has said)
- Informing and advising (giving information and advice where appropriate, for example when the patient asks, or more spontaneously, when there is good engagement).

Miller and Rollnick 2012 Motivational interviewing: Helping people change



# Motivational interviewing

<https://www.youtube.com/watch?v=bTRRNWrwRCo>



# Social support

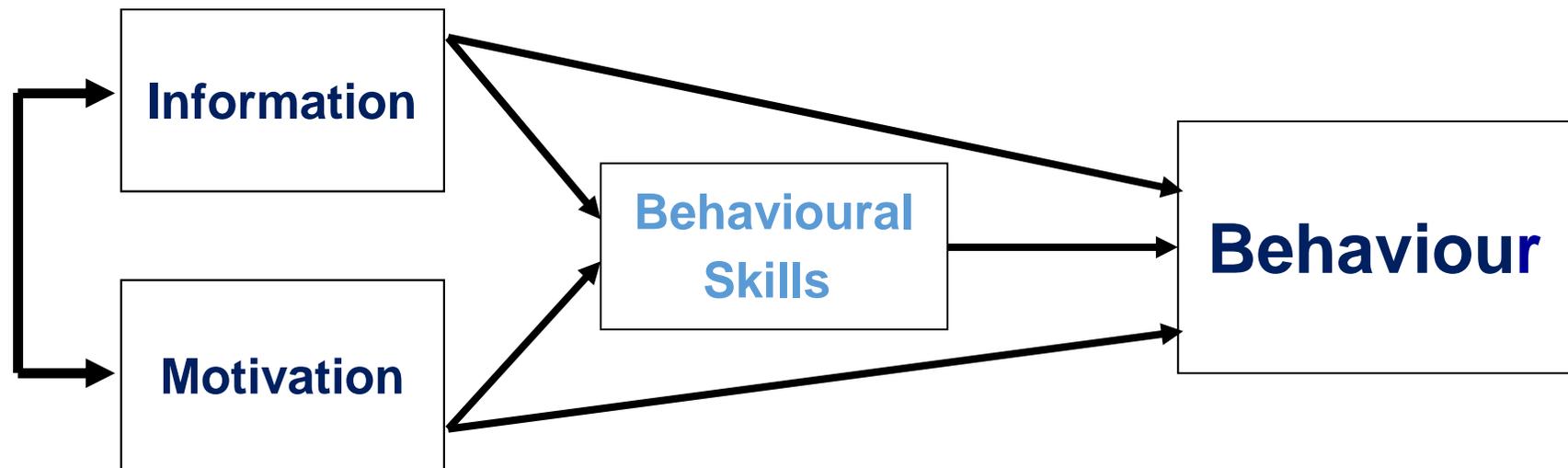


# Social support

- Can include participation or encouragement
- From family, clinical teams, and peers



# Information, motivation, behavioural skills model



Fisher, J. D. & Fisher, W. A. (1992). Changing AIDS-risk behavior. *Psychological Bulletin*, 111, 455-474



# From Motivation to Behaviour

- Across 6 studies of cancer screening, exercise and condom use:
  - Intenders who acted = 53%
  - Non intenders who acted: 7%
- Intention – behaviour gap

**Sheeran, P.** (2002). Intention-behaviour relations: A conceptual and empirical review.  
*European Review of Social Psychology*, 12, 1-36



# Behavioural skills

- Motor skills
  - How to use gym equipment
- Social skills
  - How to overcome self-consciousness in the gym
- Self-regulatory skills



# Motor skills

<https://www.cysticfibrosis.org.uk/life-with-cystic-fibrosis/cystic-fibrosis-care/staying-active/cf-fitness-space>

[https://www.youtube.com/watch?v=NXU\\_X119AGU](https://www.youtube.com/watch?v=NXU_X119AGU)

<https://www.nhs.uk/10-minute-shake-up/shake-ups#JvtAxrXJk66leiYQ.97>



# Social skills

“I would like to swim more. I’m very body conscious and because of having a stoma and I am very aware that I have quite a large chest”

“I enjoy going swimming and stuff and I enjoy sort of dancing but it’s just that I can’t do it. So I just don’t even try”

“a little conscious like sometimes but you know, I switch off really and say ‘well I’m doing what I want to do’ and I get down, I know my regime and I just stick to that really”

“Some people look at you terrified as if to say, ‘Oh my God! Are you alright?’ But (.) I think I’ve heard it all. You know, I’ve got to the stage now where I’m coughing, you know, and there’s nothing I can do about it.

“If anything, it makes me feel more normal because everyone should do exercise”

Street et al., 2014 J Health Psych

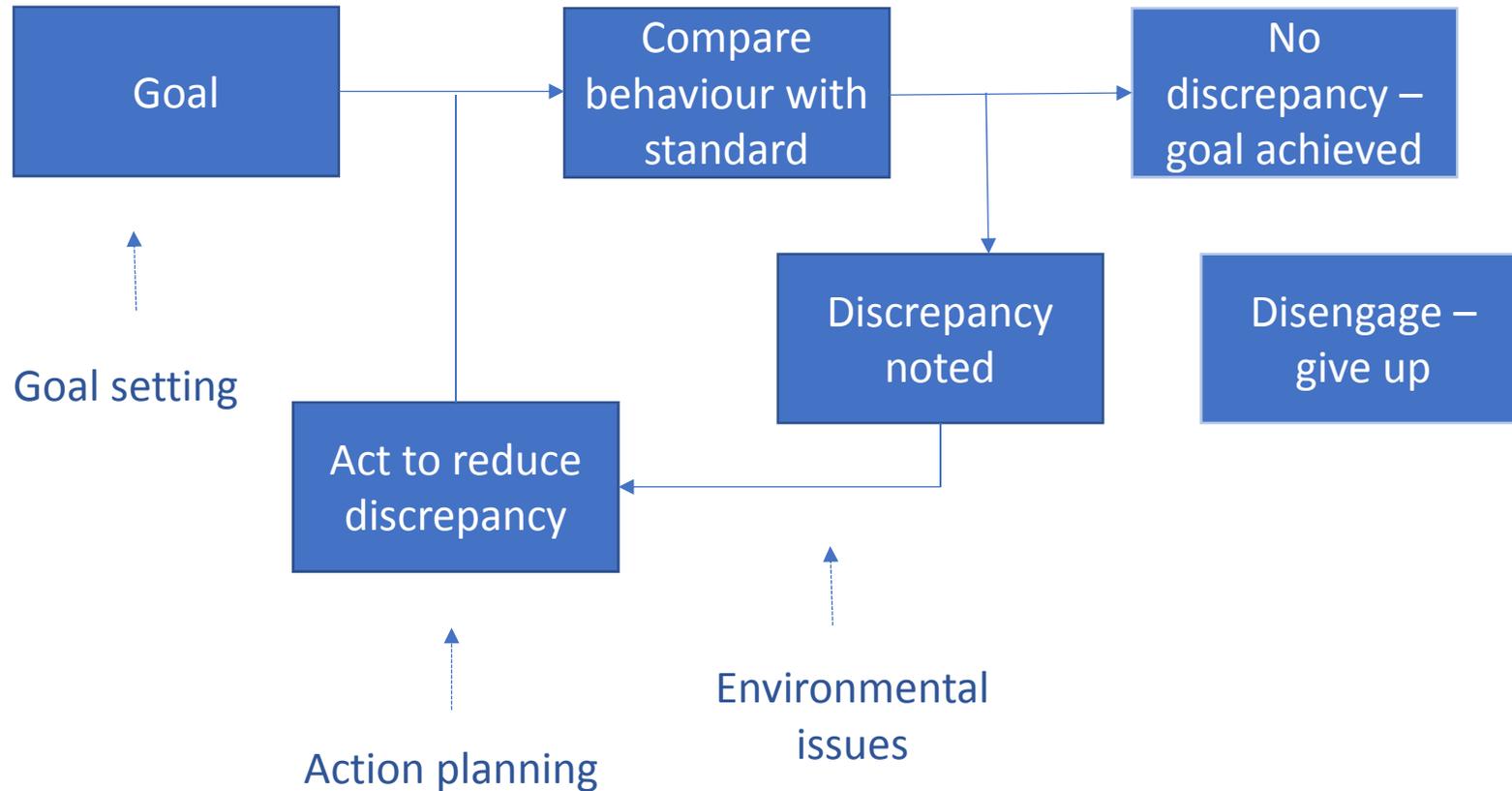


# Self regulatory skills

- Action planning
- Goal setting
- Self monitoring



# Control Theory



# Goal setting and action planning

- Involves detailed planning of what the person will do including, at least, a very specific definition of the behaviour e.g., frequency (such as how many times a day/week), intensity (e.g., speed) or duration (e.g., for how long for). In addition, at least one of the following contexts i.e., where, when, how or with whom must be specified. This could include identification of sub-goals or preparatory behaviours and/or specific contexts in which the behaviour will be performed.

Abraham & Michie (2008). A taxonomy of behavior change techniques used in interventions. *Health Psychology*.





# Goal Setting



People who set sensible goals are more likely to reach their goals than those who don't.

## Setting SMART goals.

SMART goal setting is widely used in sport work and leisure to help make people's goals easier to achieve.

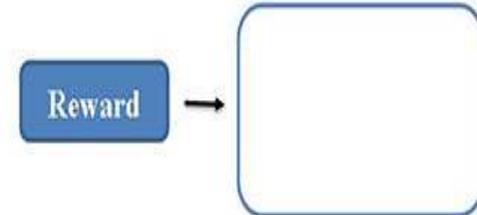
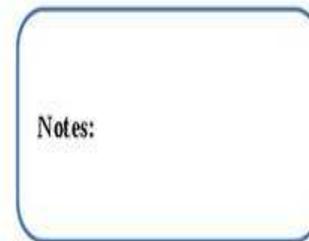
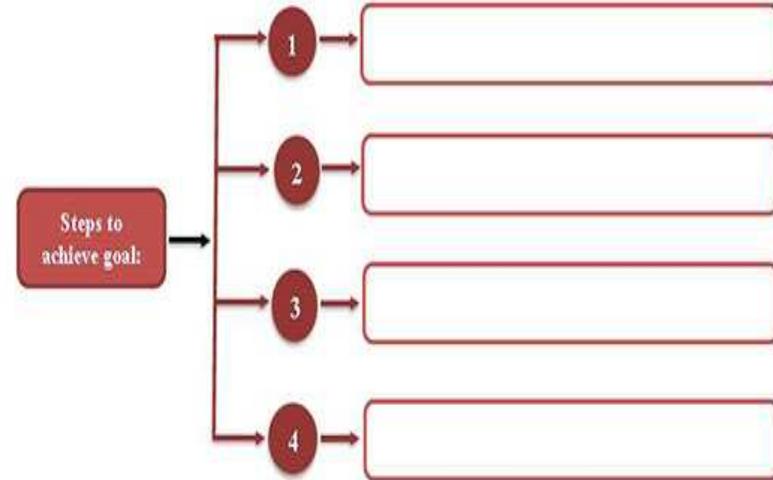
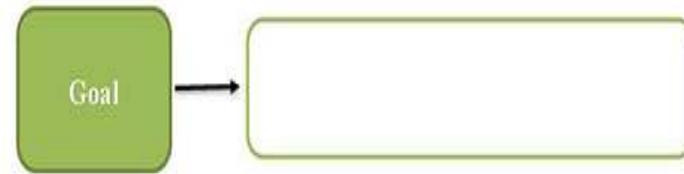
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## Action plan

**I will ...** get more exercise (remember to say what, how much, how often)

*How will I incorporate this into my daily routine?* (reminders, where, when)

*Who else might help or be involved?*

*What are the challenges /barriers (list e.g. forgetting)*

*How will I know I have succeeded?*

*On a scale of 1 to 10, how confident am I about achieving this?*

1

2

3

4

5

6

7

Barrier	How to Avoid Problem
Raining	Brolly and wellies
Working late	If I know I'm working late, I'll do an extra walk at the weekend. I can try to have a walk at lunchtime, or I get off the bus a stop earlier and walk home.



# Monitoring

The person is asked to keep a record of specified behaviour/s. This could e.g. take the form of a diary or completing a questionnaire about their behaviour.



Name \_\_\_\_\_

## Physical Activity Record

Monday		Tuesday		Wednesday		Thursday		Friday		Saturday		Sunday	
Activity	Mins												
60 Mins a Day Achieved	Yes / No	60 Mins a Day Achieved	Yes / No	60 Mins a Day Achieved	Yes / No	60 Mins a Day Achieved	Yes / No	60 Mins a Day Achieved	Yes / No	60 Mins a Day Achieved	Yes / No	60 Mins a Day Achieved	Yes / No

It is recommended that 5–12 year olds spend a total of at least 60 minutes per day doing physical activity. Write a statement comparing your physical activity levels to this recommendation and explaining whether you need to maintain or improve your level of activity.



# If then plans – an alternative to goal setting

- If-then planning to help motivated women to lose weight
- Randomised controlled trial of 45 overweight / obese women attending weight watchers classes
- Intervention: single session add on “planning session”
- Main outcome: Weight loss 8 weeks later
- Clinically significant reduction of weight by 5%:
  - 54% intervention (4.2k)
  - 8.3% control (2.1k)



# If then plans should:

- Focus on one habit at a time
- Specify the context (if)
- And the response (then)
- This “links” the situation and response in our brain
- The situation (cue) then becomes highly activated
- Helps us build habits



# Task 5

- Think about a behaviour you want to change
- Develop an if-then plan to help you achieve the behaviour
- Feedback to the rest of the group

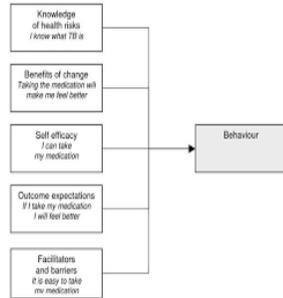


# Theories of behaviour change

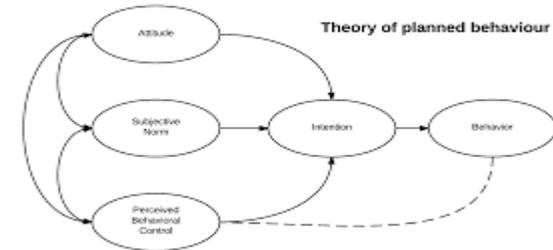
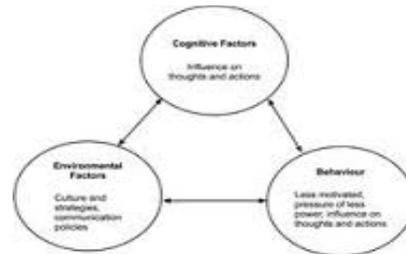
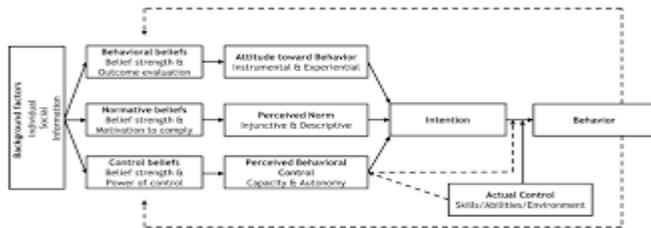
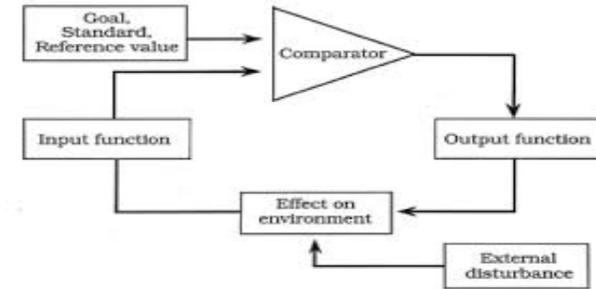
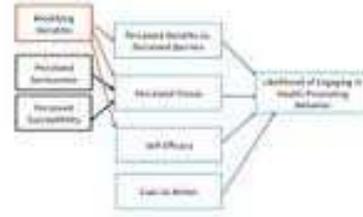
## Trans-theoretical Model of Change



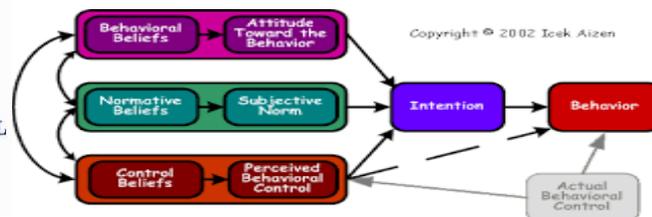
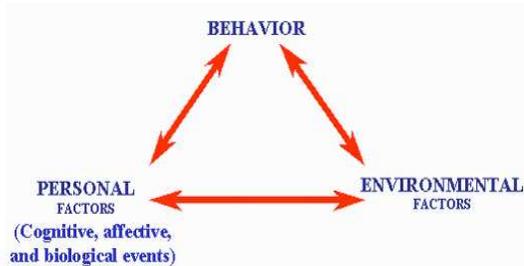
Adapted from Prochaska and Di Clemente's cycle of change model.



## The Health Belief Model



## Theory of planned behaviour



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# Making psychological theory useful

1. Knowledge
2. Skills
3. Social/professional role and identity
4. Beliefs about capabilities
5. Beliefs about consequences
6. Motivation and goals
7. Memory, attention and decision process;
8. Environmental context and resources
9. Social influences
10. Emotion
11. Behavioural regulation
12. Nature of the behaviours

Michie et al 2005

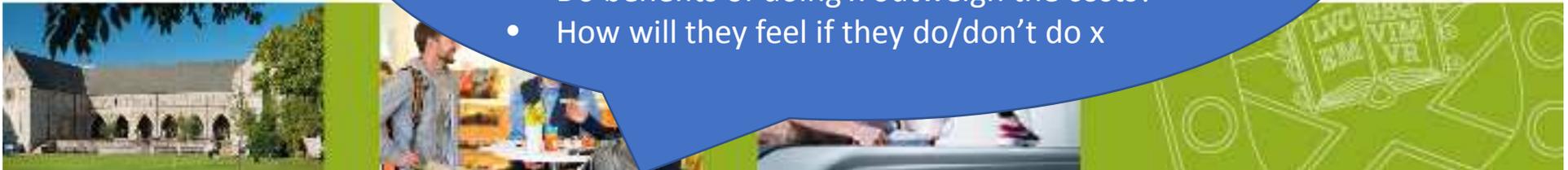


# Interview questions

- *How difficult or easy is it for them to do x?*
- *What problems have they encountered?*
- *What would help them?*
- *How confident are they that they can do x despite the difficulties?*
- *How capable are they of maintaining x?*
- *How well equipped/comfortable do they feel to do x?*

- *How much do they want to do x?*
- *How much do they feel they need to do x?*
- *Are there other things they want to do or achieve that might interfere with x?*

- *What do they think will happen if they do x?*
- *What are the costs of x and what are the costs of the consequences of x?*
- *What do they think will happen if they do not do x?*
- *Do benefits of doing x outweigh the costs?*
- *How will they feel if they do/don't do x*

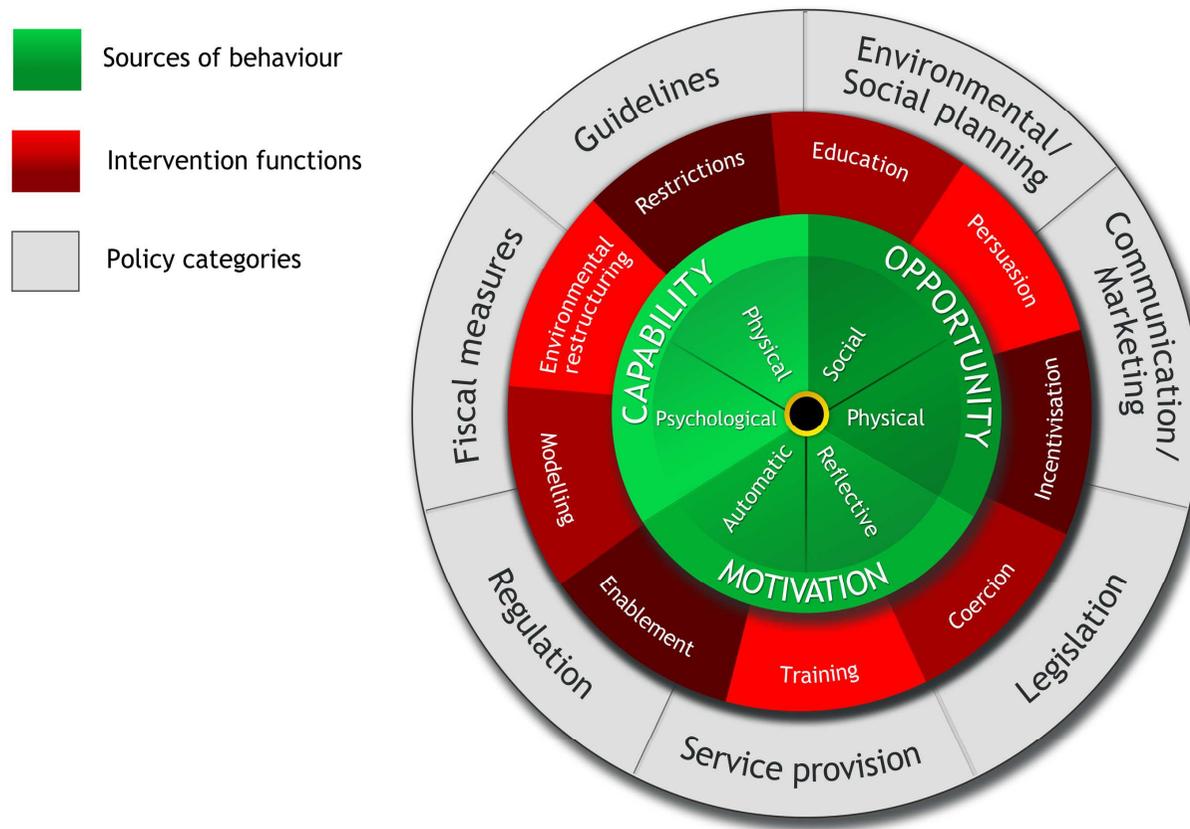


# Task 5

- Think of a behaviour you want to change
- In pairs, use the table to explore your partners beliefs about their capability / motivation/ consequences.
- How did you find it?
- Feedback to the rest of the group



# Behaviour change wheel



Michie et al. Implementation Science 2011, 6:42





Change the physical or social context

Provide an example for people to aspire to or emulate



Increase means or reduce barriers to increase capability (beyond education or training) or opportunity (beyond environmental restructuring)



Use rules to reduce the opportunity to engage in the behaviour



Increase knowledge or understanding

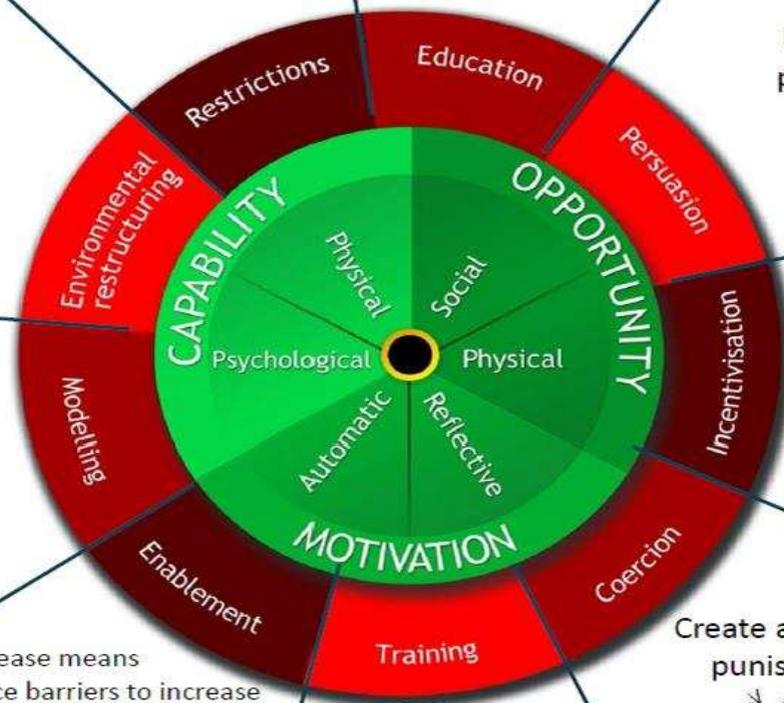


Use communication to induce positive or negative feelings to stimulate action

Create an expectation of reward



Create an expectation of punishment or cost



Impart skills



# Effective principles of individual behaviour change

- Goals and planning
  - Work with the client to:
  - agree goals for behaviour and the resulting outcome
  - develop action plans and prioritise actions
  - develop coping plans to prevent and manage relapses
  - consider achievement of outcomes and further goals and plans.
- Feedback and monitoring
  - encourage and support self-monitoring of behaviour and its outcomes and
  - provide feedback on behaviour and its outcomes.
- Social support
  - If appropriate advise on, and arrange for, friends, relatives, colleagues or 'buddies' to provide practical help, emotional support, praise or reward.



# Exercise should:

- Be healthy, fun and enjoyable, makes you feel good and can be sociable (that is, it can be undertaken with existing friends or can help develop new ones)
- Promote children and young people's independence
- Help develop children's movement skills
- Involve a wide variety of formal and informal activities such as play, dance, swimming, the gym, sport (including street sport and games) and physically active travel (such as walking, cycling and wheelchair travel)
- Become a regular part of daily life and that small lifestyle changes can be worthwhile (for example, active travel to school, the shops or the park, using the stairs and ramps instead of lifts and helping with housework)
- Be maintained by trying new and challenging activities to keep children and young people interested and motivated
- Be something that adults, especially parents and carers, should incorporate into their lives to set an example.

NICE Physical activity for children and young people 2007



