Psychological perspectives on enhancing the design of A&F

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Inspired by research. Inspiré par la recherche.
Driven by compassion. Guidé par la compassion.

Overview : (some of) Psychology's contribution to understanding and designing A&F

Core elements of A&F and theories that explain them

- Feedback Loop
- Goals
- Comparators (self, others)
- Attention

Contemporary approaches that may strengthen core elements
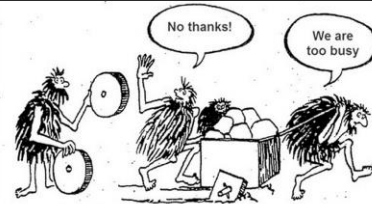
- Behaviour change techniques taxonomy
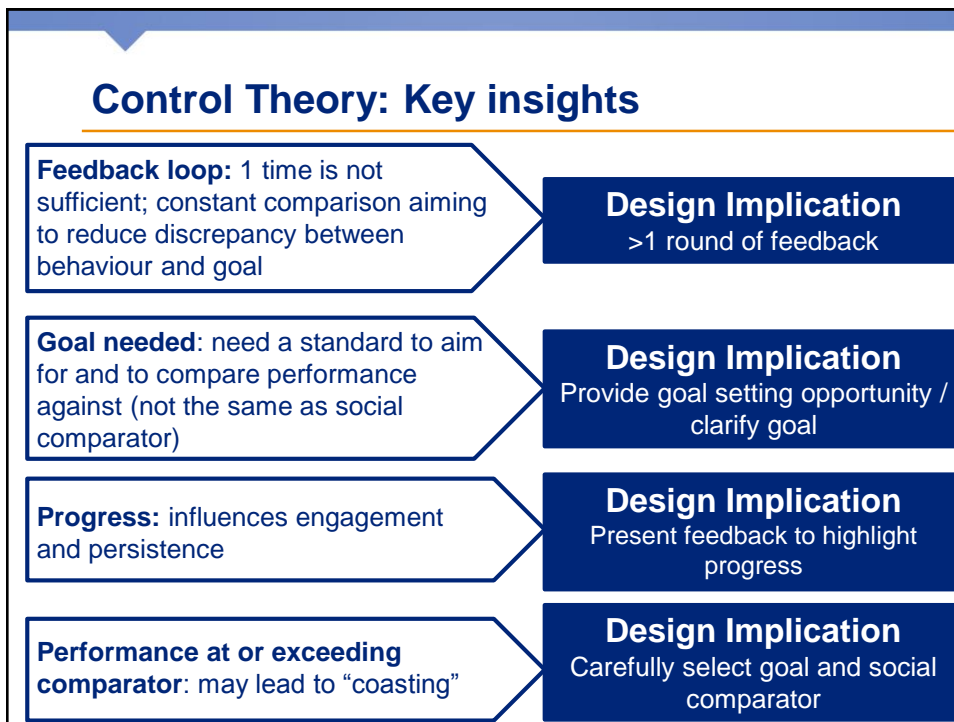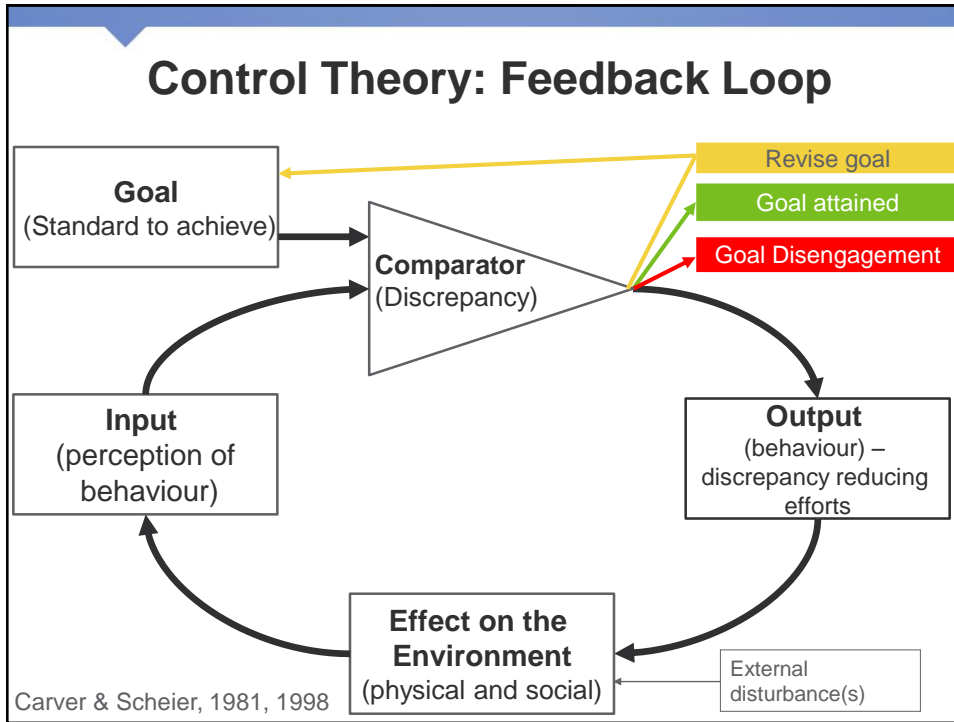- Feedback on multiple indicators

Overview of key theoretical models and design insights they provide

- **Control Theory** (Carver & Scheier)
- **Goal Setting Theory** (Locke & Latham)
- **Social Cognitive Theory** (Bandura)
- **Feedback Intervention Theory** (Kluger & DeNisi)

Why behaviour change theory?

✓ **More Efficient**
  - Build on or refine what we already know

✓ **Shared language for shared understanding**

✓ **Beyond intuitive approaches**

✓ **Offers explanations:** reasons why people respond to feedback

✓ **Suggests how to change behaviour**
  - Which specific techniques to use (or not use)

✓ **Cumulative and organized evidence-base**

Control Theory: Feedback Loop

Goal
(Standard to achieve)

Comparator
(Discrepancy)

Revise goal

Goal attained

Goal Disengagement

Input
(perception of behaviour)

Output
(behaviour) –
discrepancy reducing efforts

Effect on the Environment
(physical and social)

External disturbance(s)

Carver & Scheier, 1981, 1998

Control Theory: Key insights

Feedback loop: 1 time is not sufficient; constant comparison aiming to reduce discrepancy between behaviour and goal

Design Implication
>1 round of feedback

Goal needed: need a standard to aim for and to compare performance against (not the same as social comparator)

Design Implication
Provide goal setting opportunity / clarify goal

Progress: influences engagement and persistence

Design Implication
Present feedback to highlight progress

Performance at or exceeding comparator: may lead to "coasting"

Design Implication
Carefully select goal and social comparator

An overview of key theoretical models

- Control Theory (Carver & Scheier)
- **Goal Setting Theory (Locke & Latham)**
- Social Cognitive Theory (Bandura)
- Feedback Intervention Theory (Kluger & DeNisi)

Goal Setting Theory (Locke & Latham, 2002)

Describes key mechanisms of **how goals work**:

Having a goal focuses attention

> **Design Implication**
> Goal setting and/or commitment to a set goal needed to optimize feedback effects (feedback on behaviour without a goal may not be as effective)

Challenging goals *get* and *keep* people going

> **Design Implication**
> Specific difficult goals are more effective than urging "do your best!" goals to promote *effort* and *persistence*

Goal Setting Theory (Locke & Latham, 2002)

Factors that moderate effect of goal setting on performance

Feedback on goal progress

Design Implication
Pair goal setting with recurring feedback on progress

Commitment to the goal

importance

Design Implication
Use techniques for enhancing goal importance e.g. public commitment; signed/witnessed contract

self-efficacy

Design Implication
Use techniques for enhancing self-efficacy as part of A&F intervention

An overview of key theoretical models

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Social Cognitive Theory: Key insight 1
Self-efficacy (task-specific confidence)

✓ People with **high self-efficacy (SE) set higher more challenging goals**

✓ Discrepancies between goal and performance are **energizing when SE is high** but **discouraging when SE is low**

✓ Feedback that shows progress enhances sense of **progressive mastery** and SE

✓ Feedback showing no progress or consistently worse than others undermines SE and discourages persistence

How to enhance self-efficacy

Feedback on performance accomplishment/progress

Vicarious experience (modeling by others)

Managing emotional/physiological states

Social Persuasion

Design Implications: ensure recipients are already confident that they can do the behaviour, OR include SE-enhancing strategies

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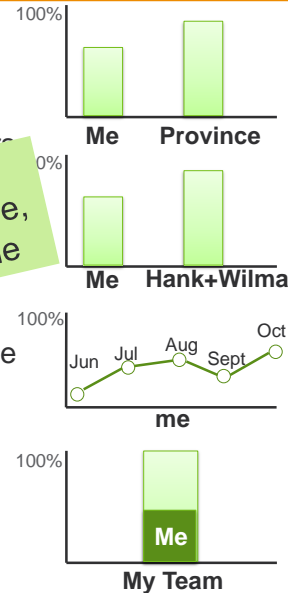## Social Cognitive Theory: Key insight 2
Distinguishing between different types of comparators

Standard Norms: a general comparison to a large representative group

Social Comparison: specific comparison to others seen as similar to oneself and one's situation
Implication: allow self-selection, comparison to similar others

Considerations for design
Not all comparators may be equally effective, nor may presenting more than one at a time

Self comparison to past performance: people want to improve on past performance and set higher (more challenging) goals once a given level is achieved unless SE is low

Collective comparison: evaluates own contribution to the team's success/performance

100%
Me   **Province**

Me   **Hank+Wilma**

100%
Jun Jul Aug Sept Oct
me

100%
Me
My Team

6

An overview of key theoretical models

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Feedback Intervention Theory: Key insights

Feedback **directs attention to discrepancies**	**Design Implications**
Feedback **sometimes detrimental**	✓ If discrepancies not clear, will not get attention
Repeated negative feedback can lead to disengagement (**learned helplessness[1]**)	✓ Be mindful of the 'worst' performers
Feedback can **focus attention on task** or **focus attention on self**	✓ User testing key to ensure feedback interpreted for tasks not 'taken personally'

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                        ┌──────────────────┐         ┌──────────────┐
                        │ Attention on self│────────▶│    Other     │
                        └──────────────────┘         │  Behaviour   │
┌──────────────┐                                     │ Performance  │
│   Feedback   │───────▶┌──────────────────┐         └──────────────┘
│ Intervention │        │  Attention on    │
└──────────────┘        │ target behaviour │         ┌──────────────┐
                        └──────────────────┘         │    Target    │
                        ┌──────────────────┐────────▶│  Behaviour   │
                        │  Attention on how│         │ Performance  │
                        │ to improve target│         └──────────────┘
                        │    behaviour     │
                        └──────────────────┘
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Adapted from Kluger & DeNisi (1996) & Hysong et al (2012); [1]Mikulincer 1988, 1989

Looking forward

- **Behaviour change techniques taxonomy** (Michie et al 2013)
- **Feedback on multiple indicators** (Schmidt & DeShon, 2007; Vancouver et al 2010)

Not all A&F created equal

Most lists and taxonomies (e.g. EPOC) describe A&F at a high level = helpful for communication but not for distinguishing content and "flavours" of A&F

It may help to:

✓ Tease apart the content of the **core elements** of an A&F intervention to better understand **active ingredients**

✓ Describe **supplemental techniques** operating alongside A&F interventions

✓ **Use generalizable labels** to these fine grained elements to help stakeholders apply specific A&F interventions in their setting

ORIGINAL ARTICLE

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

Susan Michie, DPhil, CPsychol · Michelle Richardson, PhD · Marie Johnston, PhD, CPsychol · Charles Abraham, DPhil, CPsychol · Jill Francis, PhD, CPsychol · Wendy Hardeman, PhD · Martin P. Eccles, MD · James Cane, PhD · Caroline E. Wood, PhD

Behaviour change techniques taxonomy (Michie et al 2013)

Feedback and monitoring
- Monitoring of behaviour by others without feedback
- Feedback on behaviour/outcomes of behaviour
- Feedback on outcomes of behaviour
- Self-monitoring of behaviour
- Self-monitoring of outcomes of behaviour
- Monitoring of outcome(s) of behaviour without feedback
- Biofeedback

Regulation
- Conserving mental resources
- Pharmacological support
- Reduce negative emotions
- Paradoxical instructions

Goals and Planning
- Goal setting (behavior) OR Goal setting (outcome)
- Problem solving
- Action planning
- Review behavior goal(s) OR Review outcome goal(s)
- Discrepancy between current behavior and goal
- Behavioral contract
- Commitment

Repetition and substitution
- Behavioural practice/rehearsal
- Behaviour substitution
- Habit formation
- Habit reversal
- Overcorrection
- Generalisation of target behaviour
- Graded tasks

Comparison of outcomes
- Credible source
- Pros and cons
- Comparative imagining of future outcomes

Reward and threat
- Incentive (outcome
- Material incentive (behaviour)
- Social incentive
- Non-specific incentive
- Self-incentive
- Self-reward
- Reward (outcome)
- Material reward (behaviour)
- Non-specific reward
- Social reward
- Future punishment

Shaping Knowledge
- Instruction on how to perform behaviour
- Information about Antecedents
- Re-attribution
- Behavioural experiments

Social Support
- Social support (unspecified)
- Social support (practical)
- Social support (emotional)

Natural Consequences
- Info about health consequences
- Info about emotional consequences
- Info re social and environment consequences
- Salience of consequences
- Monitoring of emotional consequences
- Anticipated regret

Identity
- Identification of self as role model
- Framing/reframing
- Incompatible beliefs
- Valued self-identify
- Identity linked with changed behaviour

Scheduled consequences
- Behaviour cost
- Punishment
- Remove reward
- Reward approximation
- Rewarding completion
- Situation-specific reward
- Reward incompatible behaviour
- Reward alternative behaviour
- Reduce reward frequency
- Remove punishment

Antecedents
- Adding objects to the environment
- Restructuring the physical environment
- Restructuring the social environment
- Avoidance/reducing exposure to cues
- Distraction
- Body changes

Associations
- Prompts/cues
- Cue signalling reward
- Reduce prompts/cues
- Remove access to the reward
- Remove aversive stimulus
- Satiation
- Exposure
- Associative learning

Comparison of behaviour
- Demonstration of the behaviour
- Social comparison
- Information about others' approval

Covert learning
- Imaginary punishment
- Imaginary reward
- Vicarious consequences

Teasing apart A&F core components and their variants using the BCT taxonomy

Feedback

Feedback on behaviour
Monitor and provide informative or evaluative feedback on performance of the behaviour *(form, frequency, duration, intensity)*

Feedback on outcome(s) of behaviour
Monitor + provide feedback on the outcome of performance of behaviour

Self-monitoring of behaviour
Establish a method for the person to monitor and record their behaviour as part of a behaviour change strategy

Self-monitoring of outcome of behaviour
Establish a method for the person to monitor and record the **outcome(s)** of their behavior as part of a behavior change strategy

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Teasing apart A&F core components and their variants using the BCT taxonomy

Goals & Planning

Goal setting (behaviour)
Set or agree on a goal defined in terms of the behavior to be achieved

Goal setting (outcome)
Set or agree on a goal defined in terms of a positive **outcome** of wanted behavior

Review behaviour goals
Review behavior goal(s) jointly with the person and consider modifying goal(s) or behavior change strategy in light of achievement. May lead to re-setting same goal, small change in goal or setting new goal, or no change

Review outcome goals
Review outcome goal(s) jointly with the person and consider modifying goal(s) in light of achievement. This may lead to re-setting same goal, small change goal or setting a new goal

Action Planning
Prompt detailed planning of performance of the behavior (must include at least: context, frequency, duration or intensity). Context may be environmental or internal

Problem Solving
Analyse, or prompt the person to analyse, factors influencing the behavior and generate or select strategies that include overcoming barriers and/or increasing facilitators

Teasing apart A&F core components and their variants using the BCT taxonomy (cont'd)

Comparators

Discrepancy between current behaviour & goal

Draw attention to discrepancies between a person's current behavior (*form, fre..., duration, intensity*) and the ... set outcome goals ... plans (...

Focus on ...
Advi...

... others' performance to ... comparison with the person's own performance

Design implications
BCTs are directly operationalizable and can be used to test variants of A&F in user centred design and evaluations

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Supplemental techniques operating alongside A&F interventions using the BCT taxonomy (BCTTv1)

Unpacking other strategies often used alongside A&F: e.g. Educational Outreach Visits or CPD events/meetings

Instruction on how to perform a behaviour
Advise or agree on how to perform the behaviour (includes '**Skills training**')

Demonstration of the behaviour
Provide an observable sample of the performance of the behaviour, directly in person or indirectly e.g. via film, pictures, for the person to aspire to or imitate (includes '**Modelling**').

Behavioural practice/ rehearsal
Prompt practice or rehearsal of the performance of the behaviour one or more times in a context or at a time when the performance may not be necessary, in order to increase habit and skill *Note: if aiming to associate performance with the context, also code* **8.3, Habit formation**

Control Theory: Feedback Loop

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Revise goal

Goal attained

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Comparator
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Discrepancy between current behaviour and goal

Input
(perception of behaviour)

Feedback on behaviour

Output
(behaviour) – discrepancy reducing efforts

Action Planning

Problem solving

Effect on the Environment
(physical and social)

Carver & Scheier, 1981, 1998

Looking forward

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- **Feedback on multiple indicators** (Schmidt & DeShon, 2007; Vancouver et al 2010)

Accounting for Feedback on Multiple Indicators

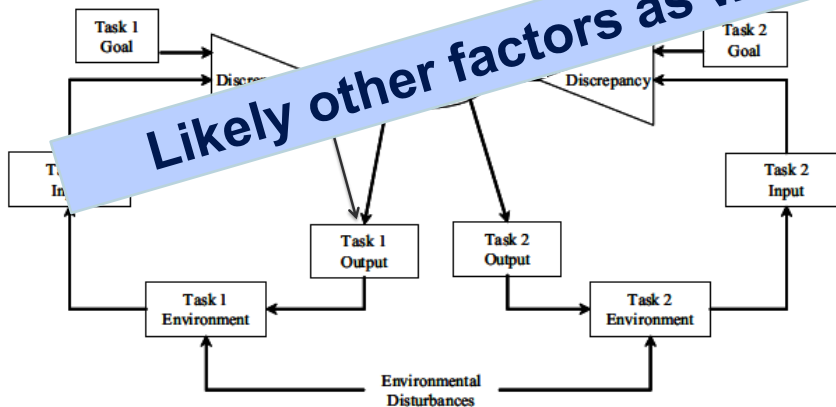## Extending control theory
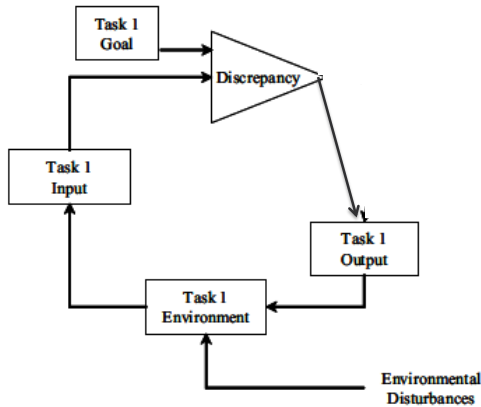
Schmidt & DeShon, 2007

What factors determine priority?

Schmidt & DeShon (2007)
- When lots of time: focus on greatest discrepancy between goal and behaviour
- When time pressure/deadline: focus on smallest discrepancy
- Incentivized
- Avoidance-framed (losses weigh more heavily than gains)

Likely other factors as well

Summary

- Psychology & behavioural sciences can provide potentially helpful design suggestions for A&F

- New methodological approaches might:
  - help to clarify variants of A&F
  - inform inform design choices
  - facilitate replication/extension in other settings

- Linking these approaches to theory can help to build cumulative evidence base

Merci
Thank you

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