Novel research methods used to explore behaviour change maintenance focusing on weight loss and physical activity

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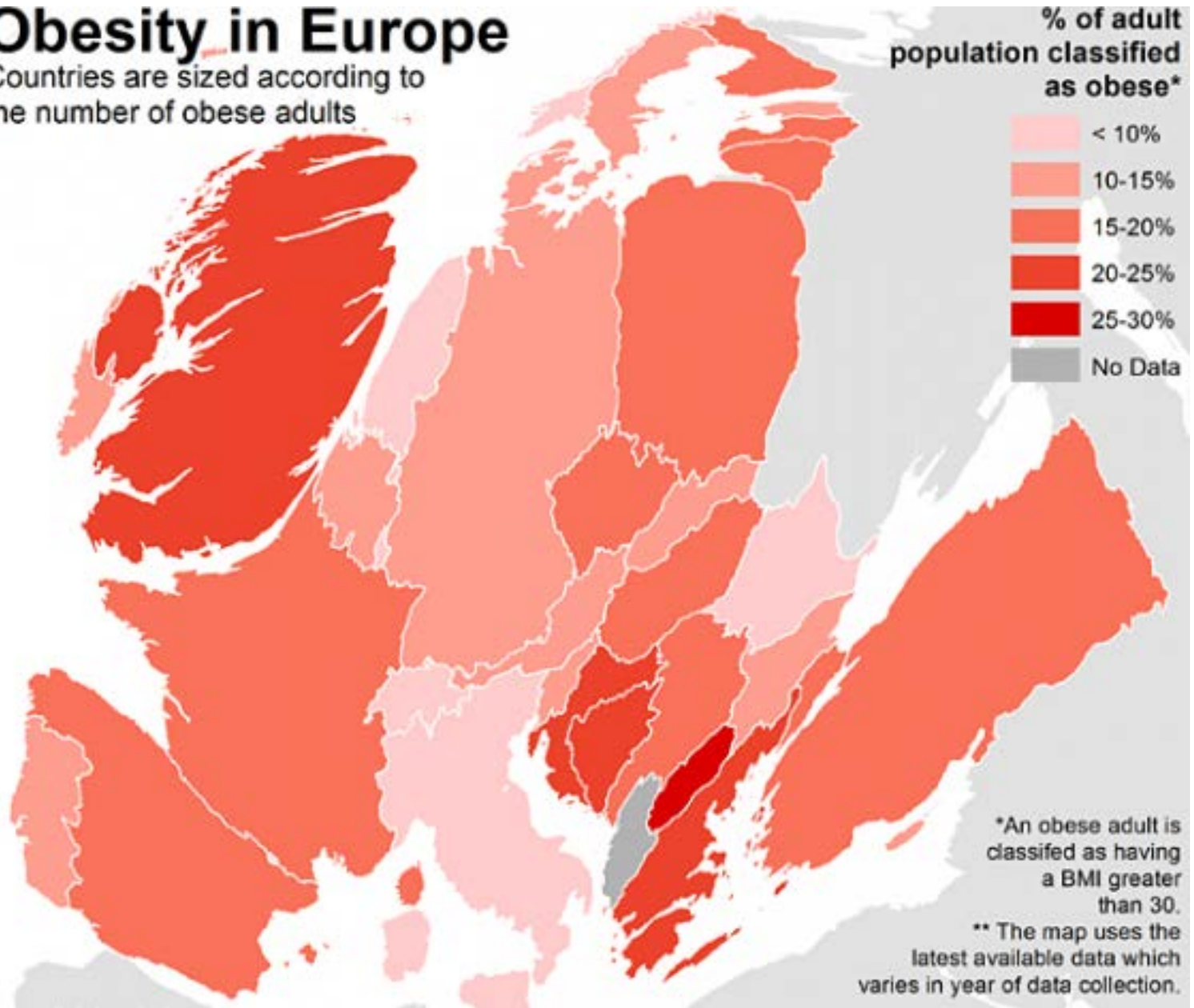
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Introduction

- Worldwide obesity has **more than doubled** since 1980

- In 2014, **39%** of adults were **overweight** (1.9 billion), and **13%** were **obese**

Obesity in Europe

Countries are sized according to
the number of obese adults

% of adult
population classified
as obese*

- < 10%
- 10-15%
- 15-20%
- 20-25%
- 25-30%
- No Data

*An obese adult is
classifed as having
a BMI greater
than 30.
** The map uses the
latest available data which
varies in year of data collection.

Weight loss maintenance

In the WHO/European Region

over 50%
of people are
overweight or **obese**

over 20%
of people are
obese

www.euro.who.int/obesity
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- People need help losing weight initially
- But they also need help keeping it off once they lost it
- Health behaviour change interventions are:
- Effective in supporting individuals in achieving temporary behaviour change
- Less effective in attaining behaviour change maintenance (Dombrowski et al, 2014)

World Health
Organization

Behaviour change maintenance

- Maintaining health behaviour change is often challenging

- Think about:

- Maintaining weight

- Exercise program

- Regular health checks etc

- Research Aim:

To advance understanding of psychological variables underpinning sustained behaviour change

Three behaviour maintenance studies

1. Systematic review of theories of behavior change maintenance
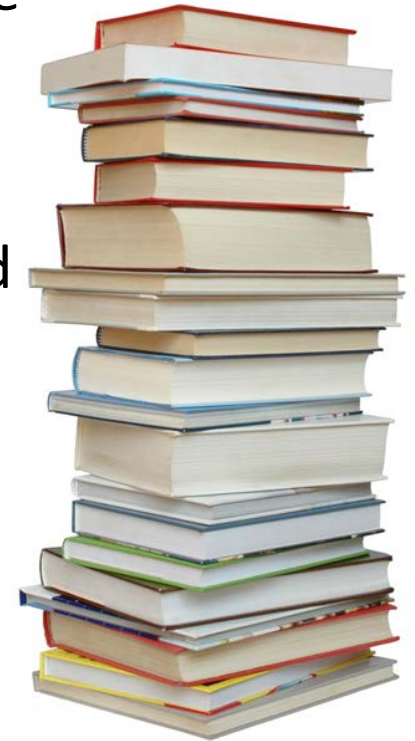
2. *N*-of-1 study in people who have lost weight

3. Qualitative data-prompted study exploring experiences of weight loss maintenance
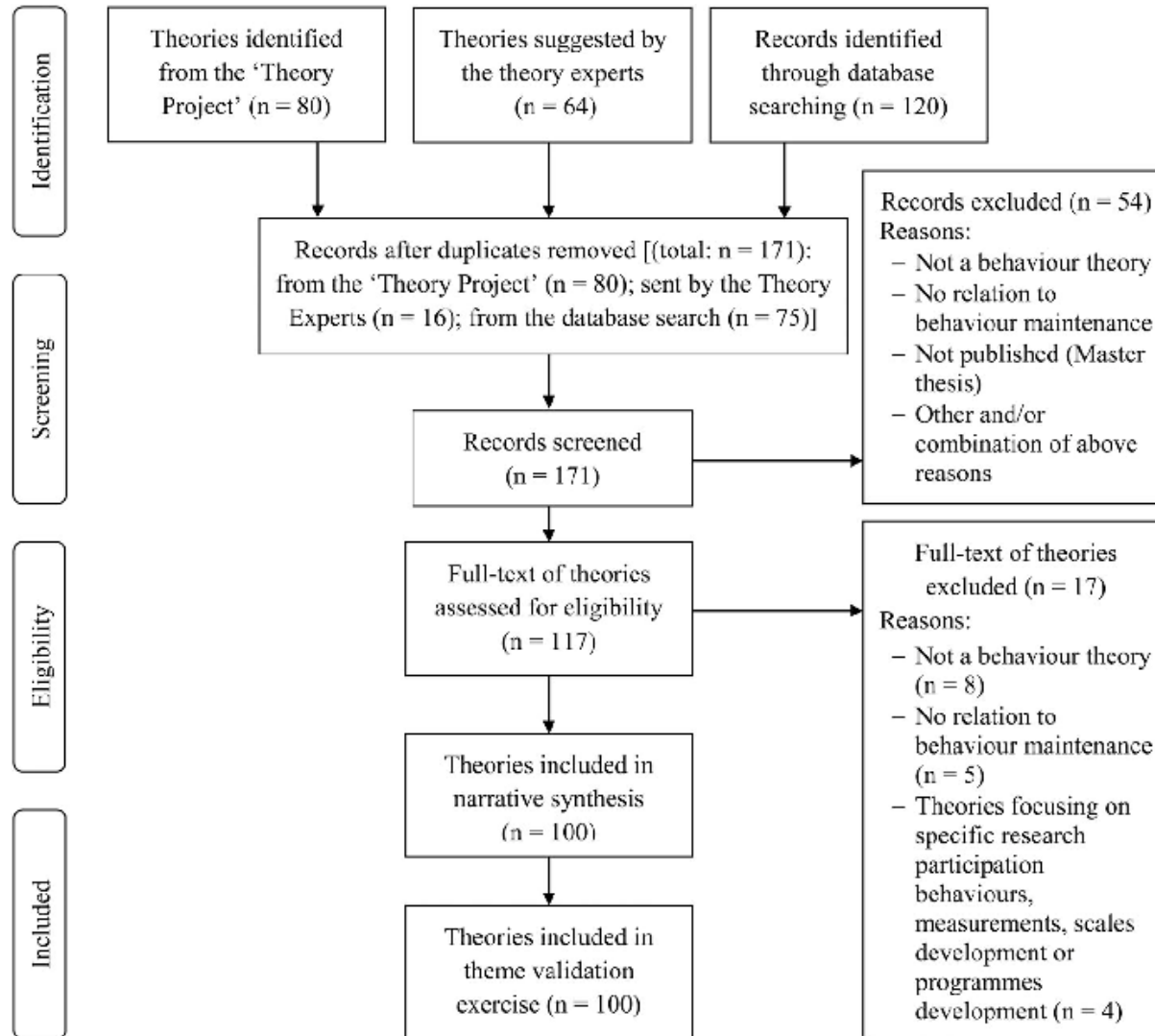
Study 1. Systematic review of theories

- **Theory identification** from 3 data sources: on-line search; UCL 'Theory Project' list; contact with 40 experts (25 replied)

- **Data Extraction:** theoretical application; specified population and/or behaviour; statements about behaviour maintenance

- **Narrative data Synthesis**

1. Testable explanations for behaviour change maintenance reviewed in included theories

2. Generation of themes and subthemes

3. Theory themes validated by 10 health psychologists

Study 1. How many behaviour change theories are there?

Study 1. Review Results

Identification

Theories identified from the 'Theory Project' (n = 80)

Theories suggested by the theory experts (n = 64)

Records identified through database searching (n = 120)

Screening

Records after duplicates removed [(total: n = 171): from the 'Theory Project' (n = 80); sent by the Theory Experts (n = 16); from the database search (n = 75)]

Records screened (n = 171)

Records excluded (n = 54)
Reasons:
- Not a behaviour theory
- No relation to behaviour maintenance
- Not published (Master thesis)
- Other and/or combination of above reasons

Eligibility

Full-text of theories assessed for eligibility (n = 117)

Full-text of theories excluded (n = 17)
Reasons:
- Not a behaviour theory (n = 8)
- No relation to behaviour maintenance (n = 5)
- Theories focusing on specific research participation behaviours, measurements, scales development or programmes development (n = 4)

Included

Theories included in narrative synthesis (n = 100)

Theories included in theme validation exercise (n = 100)

Study 1. Review Results

Five main themes:

1. **Maintenance motives**: behaviour satisfaction, enjoyment, congruence with identity

2. **Self-regulation** and coping with barriers

3. **Habits** and responses to cues

4. Psychological and physical **resources**

5. **Contextual influences**: social and environmental

1. Maintenance motives

People tend to maintain their behaviour if they:

- are satisfied with behavioural outcomes

- enjoy engaging in the behaviour

- behaviour is congruent with identity, beliefs and values.

Examples of theories:

- Model of Behaviour Maintenance (Rothman, 2000) changed into A 2 x 2 Behaviour Change Matrix (Rothman, Sheeran & Wood, 2009)

- Regulatory Fit Theory (Higgins, 2006)

- Self-Determination Theory (Deci & Ryan, 1985; 2008)

2. Self-regulation

People tend to maintain behaviour if they successfully monitor and regulate the newly adopted behaviour and have effective strategies to overcome barriers to the performance of the new behaviour.

Examples of theories:

- Self-Regulation Theory (Kanfer & Gaelick, 1991)

- Relapse Prevention Theory (Marlatt & Donovan, 2005)

- Dual process model of self-control (Hofmann et al., 2008)

3. Habits

People are effective with maintaining behaviours which have become habitual and are supported by automatic responses to relevant cues.

Examples of theories:

- Health-related model of behaviour change (Hunt & Martin, 1988)

- Habit Theory (Verplanken & Aarts, 1999; Verplanken & Orbell, 2003; Verplanken et al., 2008)

- Process Model of Lifestyle Behaviour Change (Greaves, 2012)

4. Psychological and physical resources

People are successful in maintaining behaviour if their psychological and physical resources are plentiful.

Examples of theories:

- Reflective and Impulsive Model (Strack & Deutsch, 2004)

- Self-Control Theory (Muraven & Baumeister, 2000; Baumeister, 2002)

- Goal Conflict Model (Stroebe et al., 2008)

5. Contextual influences

A supportive environment and social support are important for behaviour maintenance. People tend to maintain behaviour which is in line with relevant social changes.

Examples of theories:

- Social Cognitive/Learning Theory (Bandura, 1989)

- Social Change Theory (Thompson & Kinne, 1990)

- Normalisation Process Theory (May et al., 2007)

Study 1. Discussion

- Summary of theoretical predictions; five themes emerged: motivation, self-regulation, habits, resources and context

- Constructs are interrelated and there are pronounced dependencies between them, e.g. self-regulation depends on the level of psychological resources

- Theoretical themes can be tested in behavioural studies, e.g. *N*-of-1 study

Routledge
Taylor & Francis Group

REVIEW

Theoretical explanations for maintenance of behaviour change: a systematic review of behaviour theories

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ABSTRACT

Background: Behaviour change interventions are effective in supporting individuals in achieving temporary behaviour change. Behaviour change maintenance, however, is rarely attained. The aim of this review was to identify and synthesise current theoretical explanations for behaviour change maintenance to inform future research and practice.

Methods: Potentially relevant theories were identified through systematic searches of electronic databases (Ovid MEDLINE, Embase, PsycINFO). In addition, an existing database of 80 theories was searched, and 25 theory experts were consulted. Theories were included if they formulated hypotheses about behaviour change maintenance. Included theories were synthesised thematically to ascertain overarching explanations for behaviour change maintenance. Initial theoretical themes were cross-validated.

Findings: One hundred and seventeen behaviour theories were identified, of which 100 met the inclusion criteria. Five overarching, interconnected themes representing theoretical explanations for behaviour change maintenance emerged. Theoretical explanations of behaviour change maintenance focus on the differential nature and role of motives, self-regulation, resources (psychological and physical), habits, and environmental and social influences from initiation to maintenance.

Discussion: There are distinct patterns of theoretical explanations for behaviour change and for behaviour change maintenance. The findings from this review can guide the development and evaluation of interventions promoting maintenance of health behaviours and help in the development of an integrated theory of behaviour change maintenance.

Study 2. Observational *N*-of-1 study

- 12 participants (mean age 50.58, SD=9.92; 3M, 9F) who lost 5% of body weight for 3 months (or 6 months) gathered daily data through:

- **ecological momentary assessment** - filling in daily questionnaires send to their mobiles

- used Fitbit™ **scales** and **activity monitors** daily

- Engaged in pro-active **experience sampling** - writing messages and sending pictures

Kwasnicka, D., Dombrowski, S. U., White, M., & Sniehotta, F. F. (in press). N-of-1 study of weight loss maintenance assessing predictors of physical activity, adherence to weight loss plan and weight change. *Psychology & Health*

Study 2. N-of-1 study – design

Study 2. Results

- A range of maintenance-related theoretical variables showed differential impact on:

  - Ability to maintain weight

  - Engage in physical activity

  - Follow a personal weight loss maintenance plan

- The combination of predicting variables that had significant impact on outcome variables was unique for each individual

Kwasnicka, D., Dombrowski, S. U., White, M., & Sniehotta, F. F. (in press). N-of-1 study of weight loss maintenance assessing predictors of physical activity, adherence to weight loss plan and weight change. *Psychology & Health*

Study 2. Example of participant data time plots
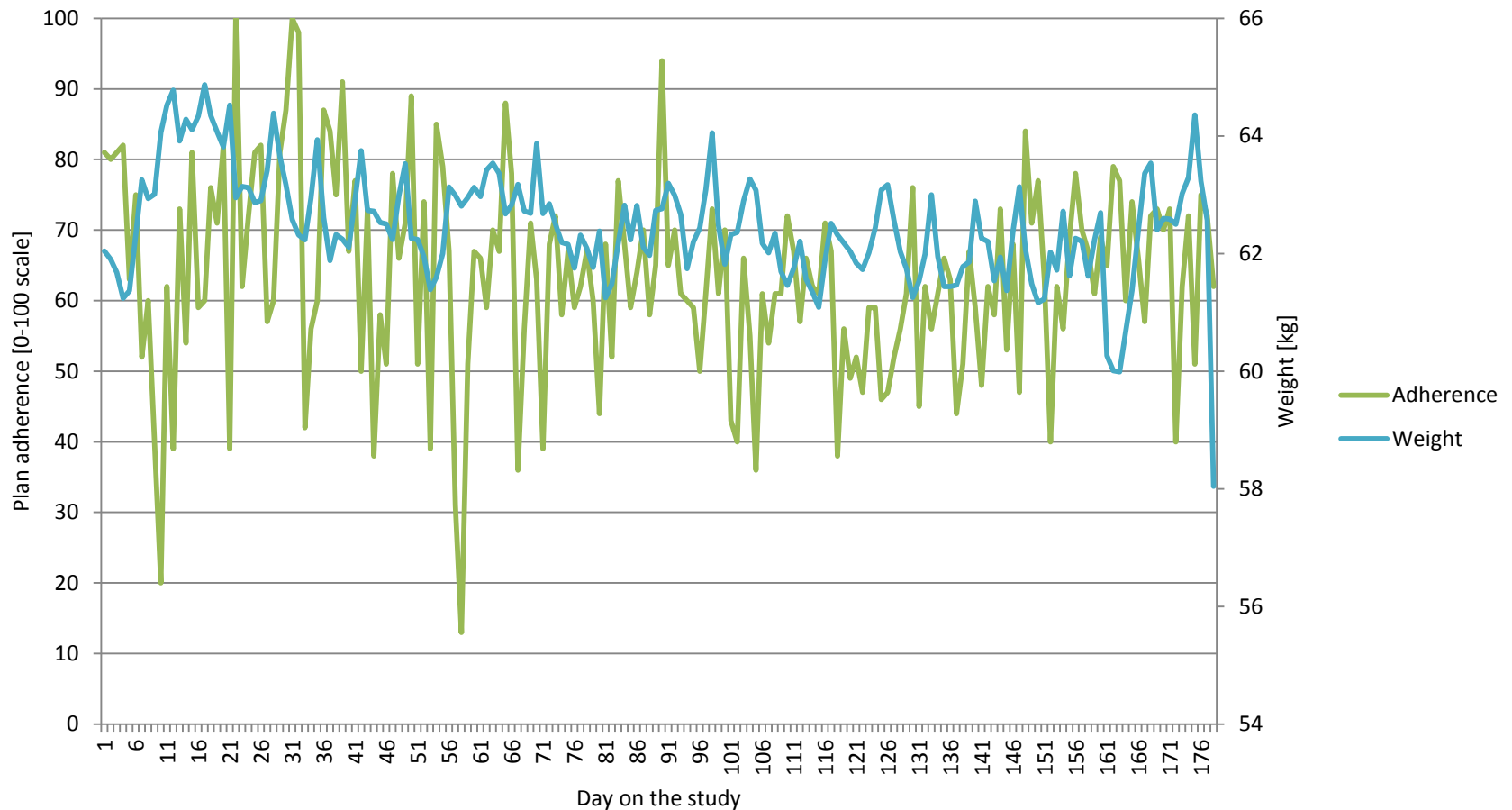
Study 2. Results

Variable	Motivation			Self-regulation					Habit	Resources				Context	
	Motivation	Importance	Benefits	Awareness	Obstacles	Confidence	Hunger	Temptation	Routines	Stress	Sleep	Energy level	Happiness	Context	Social support
P1	.32	.29	.42	.57	.29	.33		.19	.77					.53	.64
P2	.36	.25	.44	.47	.57	.44	.31	.38	.15	.27		.43	.45	.32	.18
P3	.37	.26	.28	.32	.70	.34	-.32	.55	.72			.34		.60	.45
P4	.30	.27	.48	.48		.26			.48	.19		.42	.39	.32	.29

Study 2. Discussion

- The psychological variables predicting weight loss maintenance behaviours within individuals who have recently lost weight differ between individuals

- There might be a potential for stratified behavioural medicine that should be further explored in within person designs

Study 3. Semi-structured theory driven interviews

- After 3 months (n=12) and after 6 months (n=8) each participant was presented with a **report** based on their own data including:

- weight and activity graphs

- correlations of psychological factors

- self-generated notes and pictures

- Interviews transcribed, coded and **Framework Analysis** method used
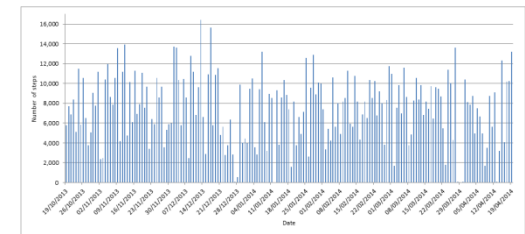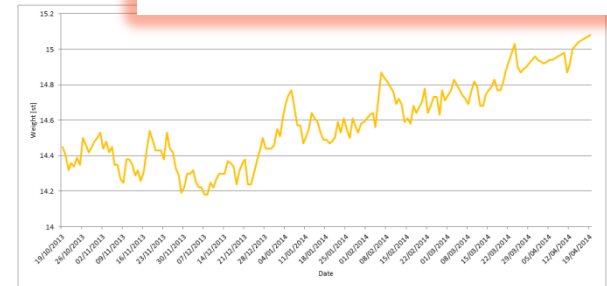
Kwasnicka, D., Dombrowski, S. U., White, M., & Sniehotta, F. F. (under review). "It's not a diet, it's a lifestyle": A qualitative study of weight loss maintenance experiences in people who have lost over 5% of body weight.

Study 3. Data-prompted

BRIEF REPORT

Data-Prompted Interviews: Using Individual Ecological Data to Stimulate Narratives and Explore Meanings

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Objective: An emerging trend in qualitative research is to use individual participant data to stimulate narratives in interviews. This article describes the method of the data-prompted interview (DPI) and highlights its potential benefits and challenges. *Method:* DPIs use personal ecological data gathered prior to the interview to stimulate discussion during the interview. Various forms of data can be used including photographs, videos, audio recordings, graphs, and text. This data can be gathered by the researcher or generated by the participant and may utilize ecological momentary assessment. *Results:* Using individual data in DPIs can stimulate visual and auditory senses, enhance memory, and prompt rich narratives anchored in personal experiences. For the researcher, DPIs provide an opportunity to explore the meaning of the data and to explain data patterns. For the participant, presented stimuli give guidance for discussion and allow them to reflect. The challenges associated with conducting DPIs include practical issues such as data selection and presentation. Data analyses require narratives to be interpreted together with the data. Ethical challenges of DPI include concerns around data anonymity and sensitivity. *Conclusions:* Combining various sources of data to stimulate the interview provides a novel opportunity to enhance participants' memories and to meaningfully assess and analyze data patterns. In the context of health promotion and illness prevention, DPI offers a unique opportunity to explore reasons, opinions, and motivations for health-related behaviors in the light of previously gathered data.

Keywords: data-prompted interview, ecological momentary assessment, qualitative methods

Study 3. Results

- The theoretical framework was a good fit with the narratives, with five main themes underpinning successful weight loss maintenance

- Using participants' data summaries and repeated interviews proved valuable in evoking narratives regarding personal experiences of weight loss maintenance

Study 3. Results

- Participants reported an identity shift from being a dieter to accepting a new, habitual healthy lifestyle

- New themes that were not included in the theories emerged

Competing goals and prioritising

"*There were a lot of days when I was working, like doing 12 hour days and you'd get home and you wanted to eat something quick rather than something healthy and you wanted to relax quicker so you might have a drink when on normal day you wouldn't have an alcoholic drink.*" – Male, 32 years old

Preparatory strategies enhancing self-regulation

*"I know that I am able to say no but some days you just, you **don't want to say no** so you just need to accept that, today I didn't want to, today I wanted to eat what I wanted to eat and I **shouldn't feel guilty about that** I just had a day where I ate what I wanted and I'm not going to beat myself up for it."* – Female, 45 years old

Study 3. Discussion

- Data presented to participants evoked memories and stimulated informed discussion

- Through the process of gathering person-specific daily data prior the interview, the interviewer built the rapport with study participants

- Participants expressed their views regarding weight loss maintenance but were likely to alter them while contrasted with their own data, e.g. relevant pictures

Overall findings and discussion

The outcomes of the studies presented unique insights into maintenance theory:

Theory review summarised which predictions of sustained health behaviour should be tackled

N-of-1 study tested these predictions within individuals who lost weight

Data-prompted interviews provided evidence for new explanations for maintained behaviour

Strengths and limitations

- Strong theoretical framework

- Novel study design and most recent technology used to assess behaviour and cognitions

- Flexible analysis applied, new explanations emerged

- Difficulties combining and analysing data from multiple sources

- *N*-of-1 analytical challenges

- Scalability of the applied design

Further research

Aims:

- further develop theory and establish an integrated theoretical model
- explore which interventions in which individuals support effective weight loss maintenance
- employ most recent technologies to support people to maintain **healthy lifestyles**

Acknowledgements

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Acknowledgements

Tailored intervention to increase PA

"Any history of physical activity in your family?"

Physical Activity Tailored intervention in Hospital Staff