

Lifestyle Behaviours

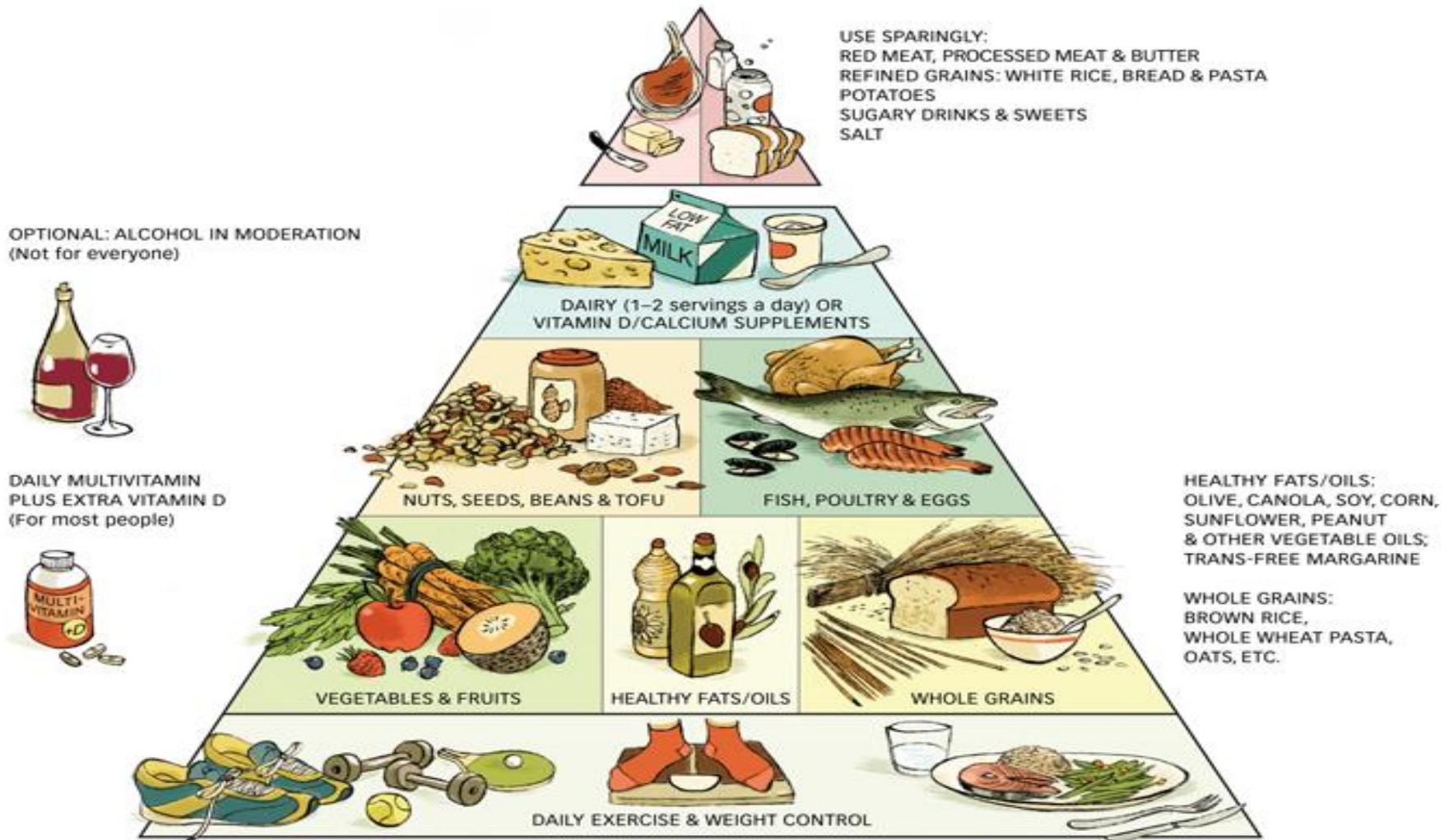
How can we facilitate change?



Colin Dunlevy,
PhD., MISCP

THE HEALTHY EATING PYRAMID

Department of Nutrition, Harvard School of Public Health



Copyright © 2008

For more information about the Healthy Eating Pyramid:

WWW.THE NUTRITION SOURCE .ORG

Eat, Drink, and Be Healthy

by Walter C. Willett, M.D. and Patrick J. Skerrett (2005)

Free Press/Simon & Schuster Inc.

Plan

- Backdrop - Obesity & Physical Activity
- Self Reporting PA
- Sleep
- Pain
- Barriers we should address
- Change..
- Blame / Shame / Language?

Sitting is the new smoking!

- Non-exercise physical activity (NEPA) (regardless of regular exercise) was associated with;
 - Waist circumference
 - cholesterol
 - metabolic health
- Also associated with a lower risk of CVD (HR=0.73) and all-cause mortality (HR=0.70).

(n=4232, over 12.5 years)
(Ekblom-Bak et al 2013)

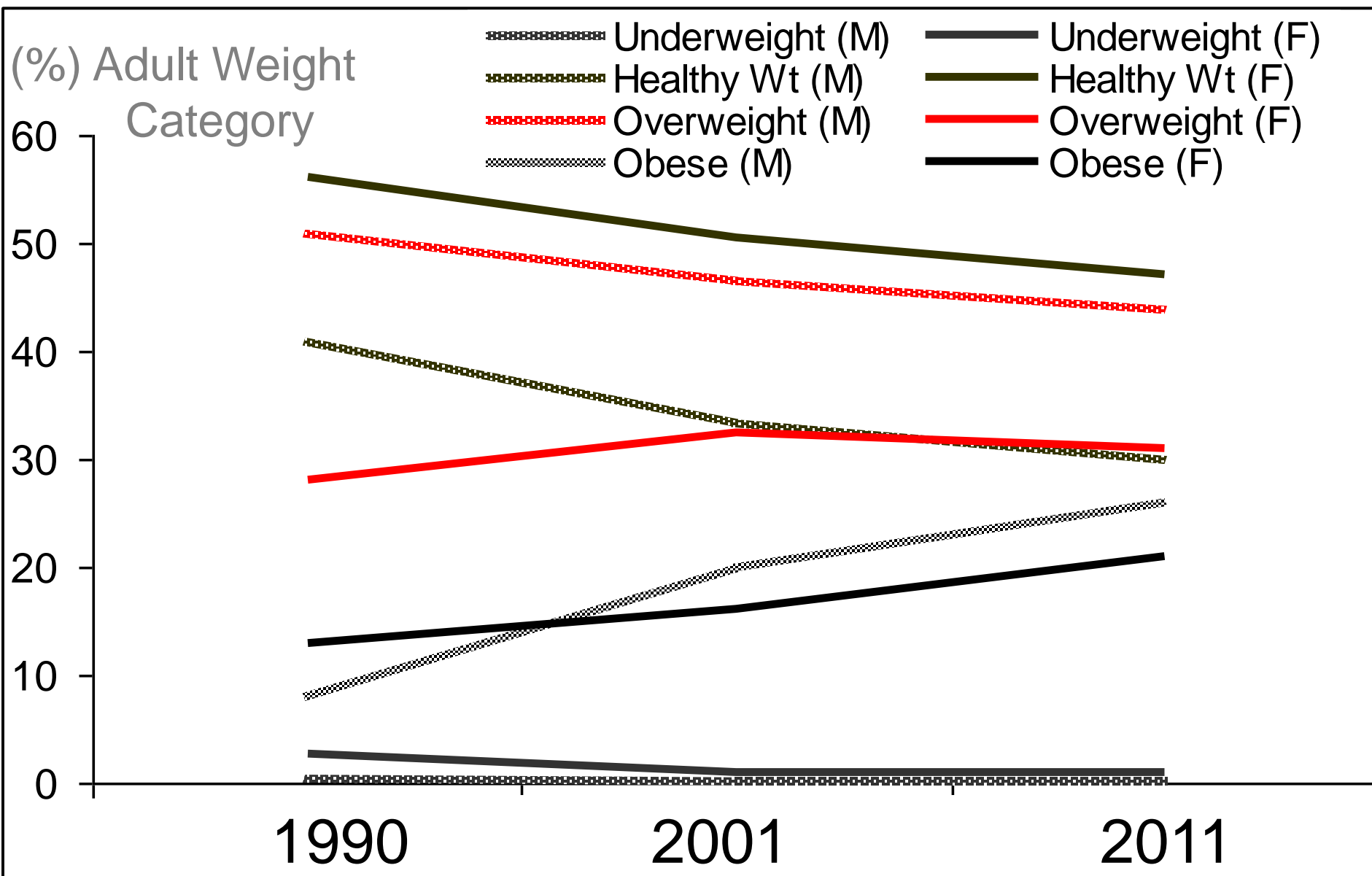


Lipid phosphate phosphatase-1 (LPP1)

- LPP1 (gene) helps prevent blood clotting and inflammation.
- Significantly suppressed when you sit for a few hours, but not activated by exercise if muscles were inactive most of the day..
- LPP1 is sensitive to sitting but resistant to exercise.

Zderic and Hamilton (2012)

National Adult Nutrition Survey (2011)



Obesity associated with increased overall mortality

Mortality Ratio

2.5

2.0

1.5

1.0

0

Metabolically Healthy & Metabolically Unhealthy

very low

low

moderate

high

20

25

30

35

40

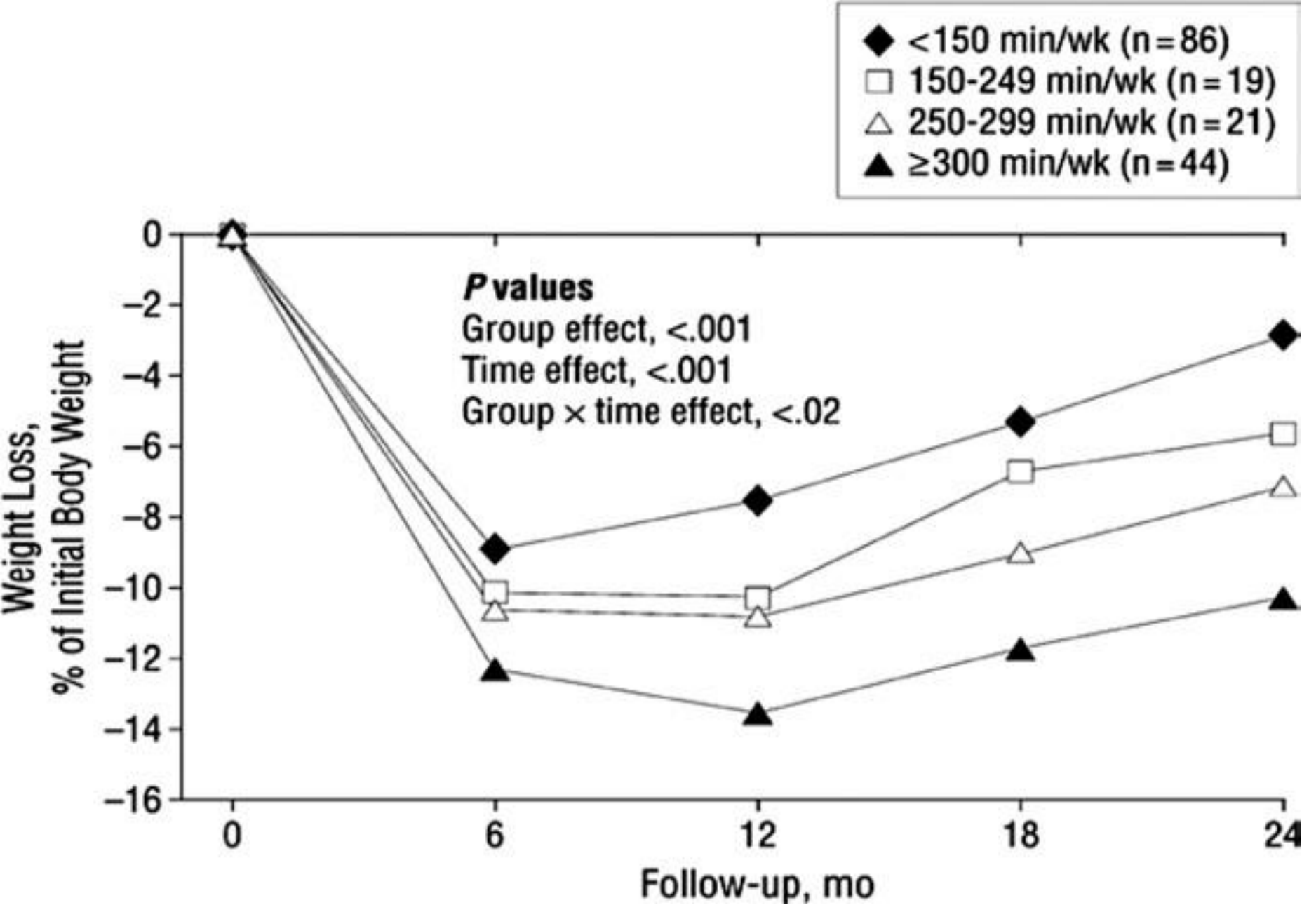
Body Mass Index, kg/m²

Bray G & Gray D 88



Body Mass Index (kg/m ²)	Mortality Ratio
18	1.2
20	1.1
25	1.0
30	1.3
35	1.7
40	2.5

shift[®] Obesity System Influence Diagram



Butryn et al, 2011

Barriers for Physical Activity

- **Ambivalence**
 - Importance
 - Perceived need
- **Self Efficacy**
 - Sleep
 - Perceived Effort
 - Fear Avoidance
 - Pain
 - Social Fear
 - Past Experience
- Sociocultural
- Functional Capacity
- Environment
- Time issues
- Etc...



(Tappe 1990, Sallis 1988, 1992, 2000, Andersen 1992; Biddle 1992; Butcher 1985; Freedson 1992; Garcia 1995; McMurray 1993; Moore 1991; Poest 1989; Reynolds 1990; Stucky-Ropp 1993; Zakarian 1994)

“150 mins/wk”!, WHO said that..

- Physical inactivity is 4th leading risk factor for global mortality (all economic groups)
- 25% of cancer (breast and colon)
- 27% type 2 diabetes
- 30% coronary heart disease
- Physical inactivity Vs Insufficient physical activity?
- High NEPA Vs Low NEPA?

How much exercise?: National Guidelines (mins/wk)

- **GetIrelandActive.ie – (HSE/ DoHC)**

We all need 150 mins/wk

Weight control 250 – 400 mins/wk



- **American College of Sports Medicine**

We all need 150 mins/wk

Weight control >250 mins/wk

Resistance training: reduced health risk, possible ↑ fat-free mass, & ↑ loss of fat mass, but not weight loss.



Who is getting 150 mins/week?

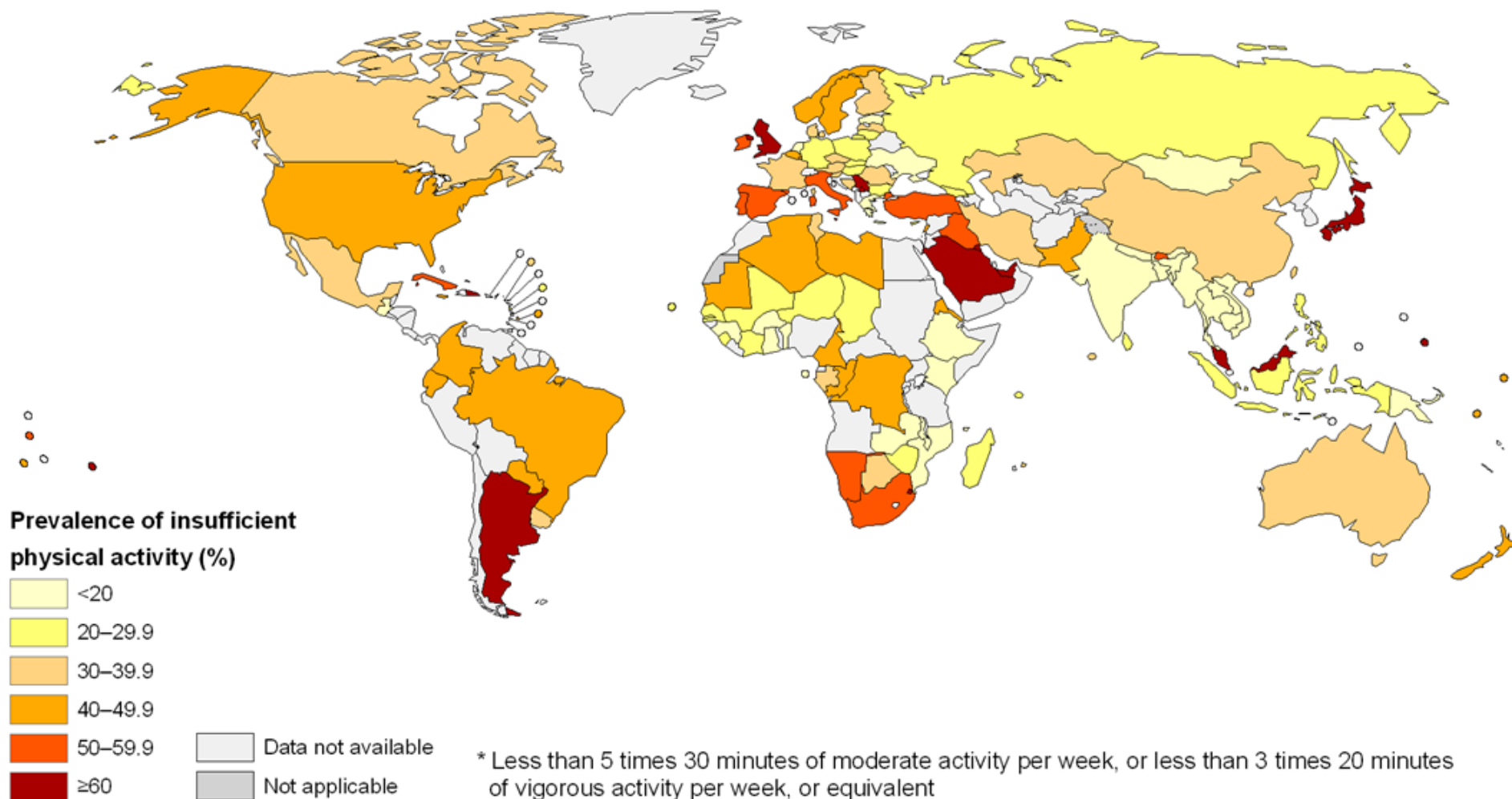
- 5,000 participants measured by Accelerometer
- 3 METS – walking 1.5 m/s (Mod Int = 3 to 6 METS)

Results

- | | | |
|----------------------|---|------|
| • Ages 16 – 19 years | - | 5.6% |
| • Ages 20 – 59 years | - | 3.5% |
| • Ages 60 + years | - | 2.4% |

(Troiano et al, 2008)

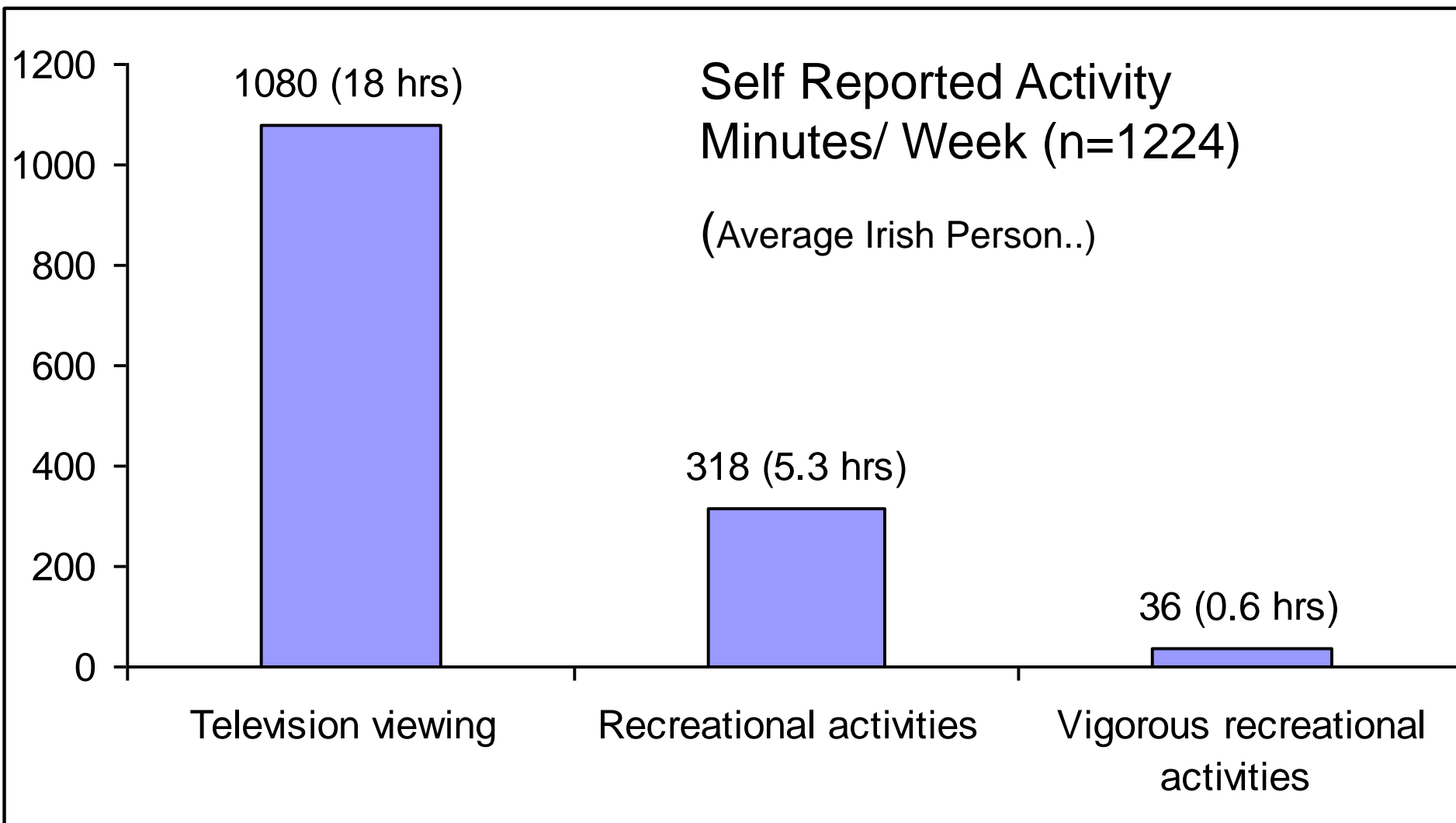
Prevalence of insufficient physical activity*, ages 15+, age standardized Both sexes, 2008



The boundaries and names shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted lines on maps represent approximate border lines for which

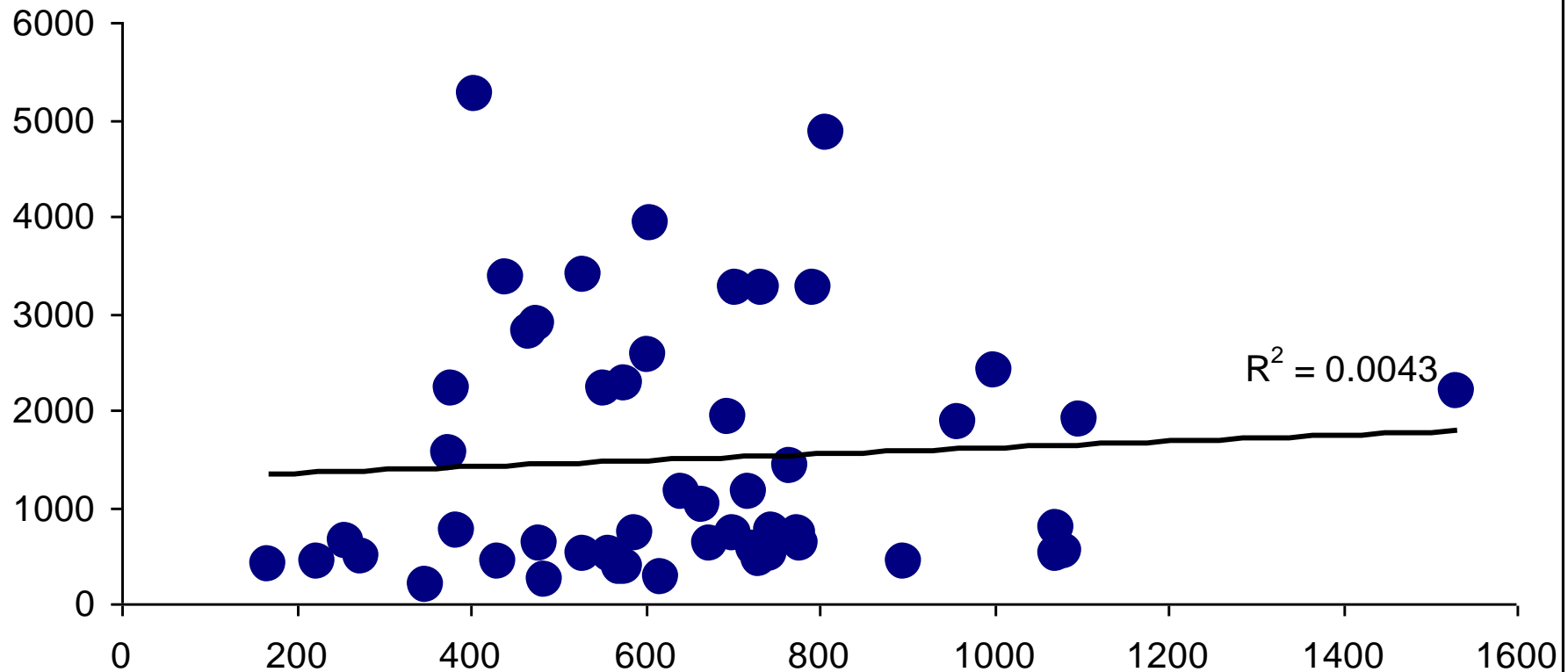
Data Source: World Health Organization
Map Production: Public Health Information
and Geographic Information Systems (GIS)

National Adult Nutrition Survey (2011)



Self-Reported PA levels

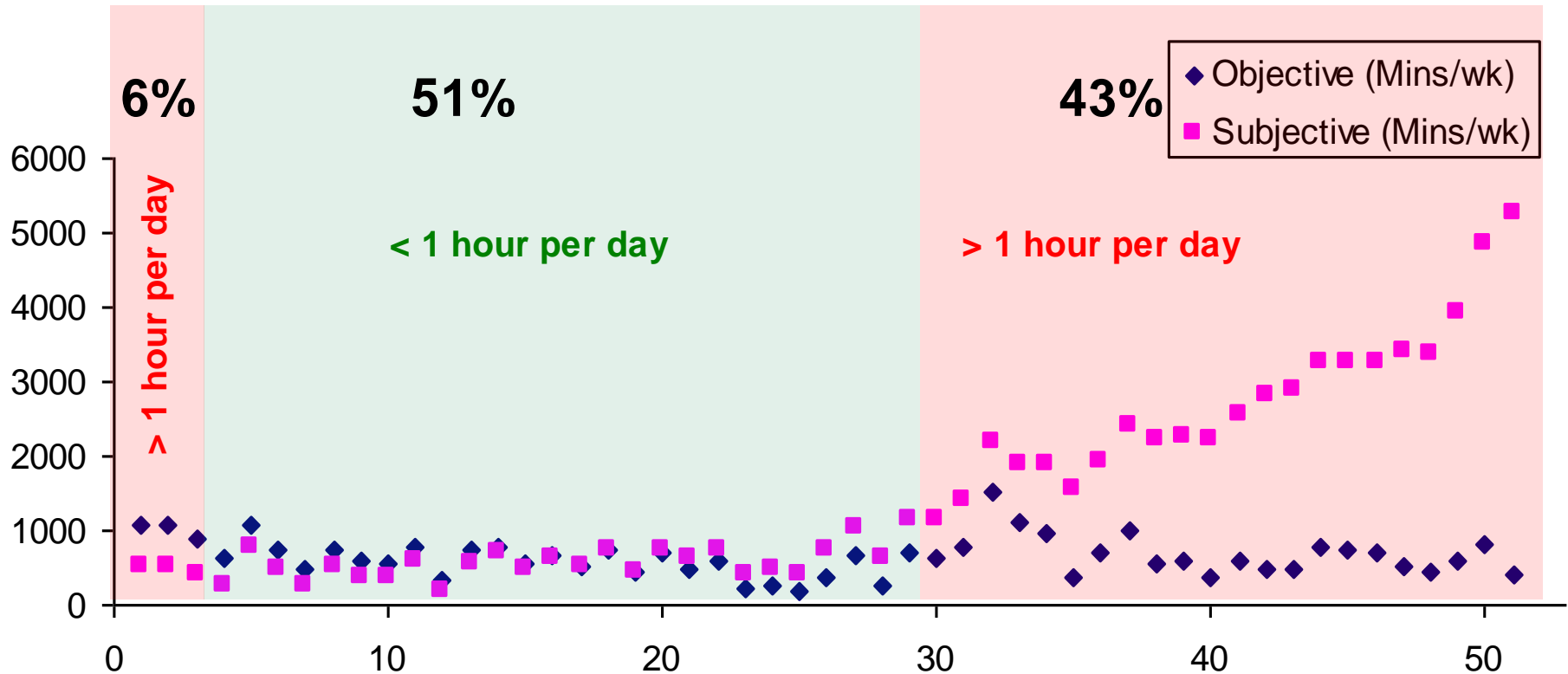
Subjective Vs Objective (Mins/wk)



Lambe et al 2013 (Unpublished)

Recall Bias is a Problem

Ascending differences - Observed and Self Reported (Mins/wk)



Lambe et al 2013 (Unpublished)

Adams et al, 2005, Troiano et al, 2008, Beyler et al 2008

PA Promotion Cochrane Review (Dobins et al, 2009)

- The best primary strategy for improving the long-term health ..into adulthood .. creating **lifestyle patterns of regular physical activity...**
- => Internalisation (need for low ambivalence and high self-efficacy)

Sedentary Cycle

Lower Confidence & Motivation to Move



Lower Physical Activity



More effort required to move, leading to more sedentary behaviour



Further Loss of "History of Use" of CV and atrophy

Lower Functional Capacity, Lower Fitness, Weight gain



Sleep



Sleep and Obesity

- Decr. sleep is a risk factor for obesity.

(Cappuccio FP et al, 2008, Gangwisch GE et al, 2005)

- 33% more likely to have successful weight loss if you sleep well.

(Thomson CA et al, 2012)

- Sleeping > 7 hours/night ↑ weight loss.

(Thomson CA et al, 2012)

- ↓ Leptin, ↑ Ghrelin = ↑ Appetite

(Crummy et al, 2006, Chin, 1999, Makinodan et al, 2008)



Sleep, OSAS & Physical Function

Parameter	Sleeps <6 Hours/night (n=147)		Sleeps 6-8 Hours/night (n=167)		Sleeps >8 Hours/night (n=54)		P ¹	P ²	P ³
OSAS	34	(23.1%)	29	(17.4%)	11	(20.4%)			
RHR (bpm)	78	±13	77	±12	80	±12	0.221	0.841	0.899
Activity Level (Min/week)	91.3	±140.7	105.2	±137.1	123.8	±143.5	0.323	0.394	0.335
Grip Strength	33.3 ^a	±11.9	36.3	±12.7	31.9 ^a	±11.1	0.053	0.005	0.005
Step Speed (step/s)	0.43 ^b	±0.10	0.46	±0.12	0.39 ^a	±0.11	<0.001	<0.001	<0.001
Gait Speed (m/s)	1.09	±0.32	1.19	±0.28	1.07 ^a	±0.29	0.004	0.009	0.053
Completer Step Speed (step/s)	0.46 ^b	±0.09	0.48	±0.11	0.43 ^a	±0.08	0.037	0.002	0.008
Completer Gait Speed (m/s)	1.19 ^b	±0.24	1.22	±0.25	1.14 ^a	±0.22	0.092	0.008	0.038

Data are expressed as mean ±standard deviation or as number (percentage).

1. P values were calculated using the Independent samples T Test and the Chi Squared Test.

2. P values were calculated using analyses of covariance and multivariate logistic regression analyses adjusting for age, BMI and gender.

3. P values were calculated using analyses of covariance and multivariate logistic regression analyses adjusting for age, BMI, gender, Diabetes & OSAS.

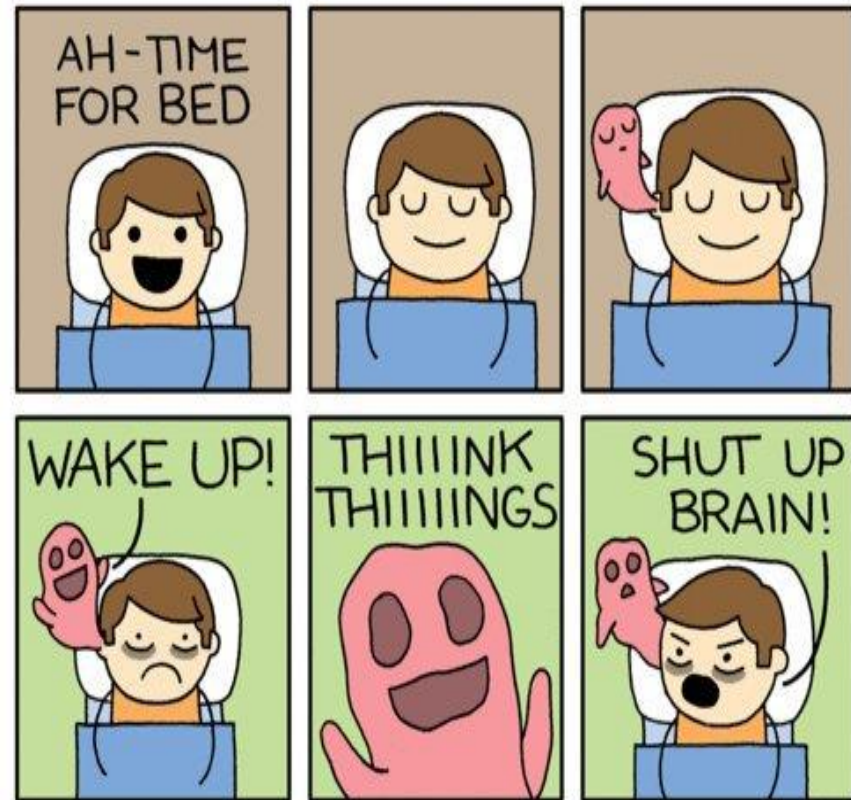
a. Significantly different from 6-8h/night group in the final statistical model.

b. Significantly different from >8h/night group in the final statistical model.

n, number; BMI, body mass index; OSAS, obstructive sleep apnoea syndrome; QOL, quality of life; sBP, systolic blood pressure; RHR, resting heart rate.

Sleep Hygiene

- Structured Rise Time
- Structured Bed Time
- Stimulants / Alcohol
- Electronics
- Routine / rituals
- Relaxation/Stress Mgt techniques
- Environment..



Pain



Musculoskeletal System

- OW and OB are associated with musculoskeletal pain.
- \uparrow BMI associated with \uparrow pain².
- Obese & Relative Risk:
 - TKR 32 times greater
 - THR 8.5 times greater³



1. Paulis WD, Silva S, Koes BW, van Middelkoop M. Overweight and obesity are associated with musculoskeletal complaints as early as childhood: a systematic review. *Obes Rev*. 2013 Aug 14.
2. Stone AA, Broderick JE. Obesity and Pain Are Associated in the United States. *Obesity* 2012;20:7:1491-1495.
3. Cangulani M, Kalairajah Y, Peel T, et al: The relationship between obesity and the age at which hip and knee replacement is undertaken. *J Bone Joint Surg Br* 90:360-363, 2008.

Musculoskeletal System

	Pain	LBP	Knee Pain	Other MSk
% (n=316)	86% (273)	69% (218)	53% (166)	51% (161)



Musculoskeletal System

	Initial	At 8/12	Change	p value
LBP (n=78) Worst	7.4 (2.6)	5.6 (3.6)	-1.8 (3.8)	$p < 0.001$
Knee Pain (n=59) Worst	6.9 (2.6)	5.8 (3)	-1.1 (3)	$p < 0.005$
Other Pain (n=40) Worst	6.8 (2.2)	5.5 (3.6)	-1.3 (3.1)	$p = 0.01$

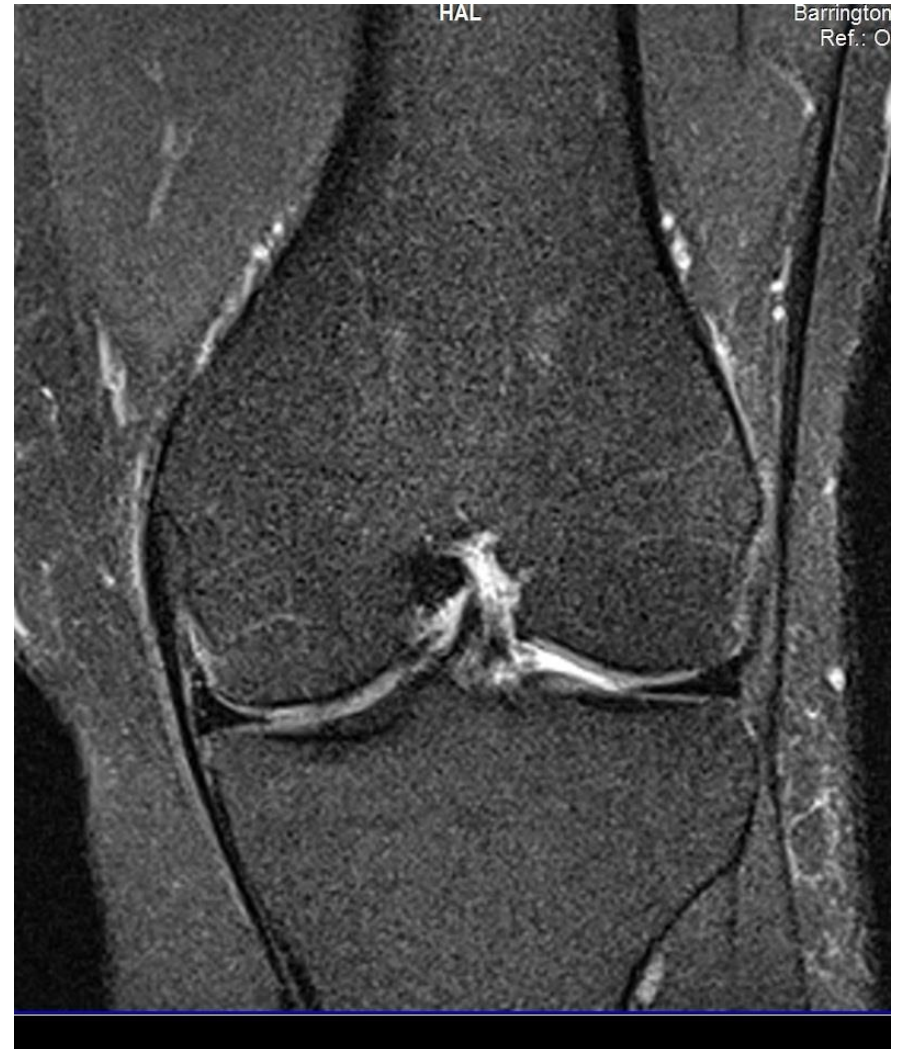


Case Study - MMcG

- Weight Management
- Dynamic Quads
- Pool Walking
- Progressive Exercise (“Golden Window”)
- Self-efficacy

Initial Worst (2010) 9/10

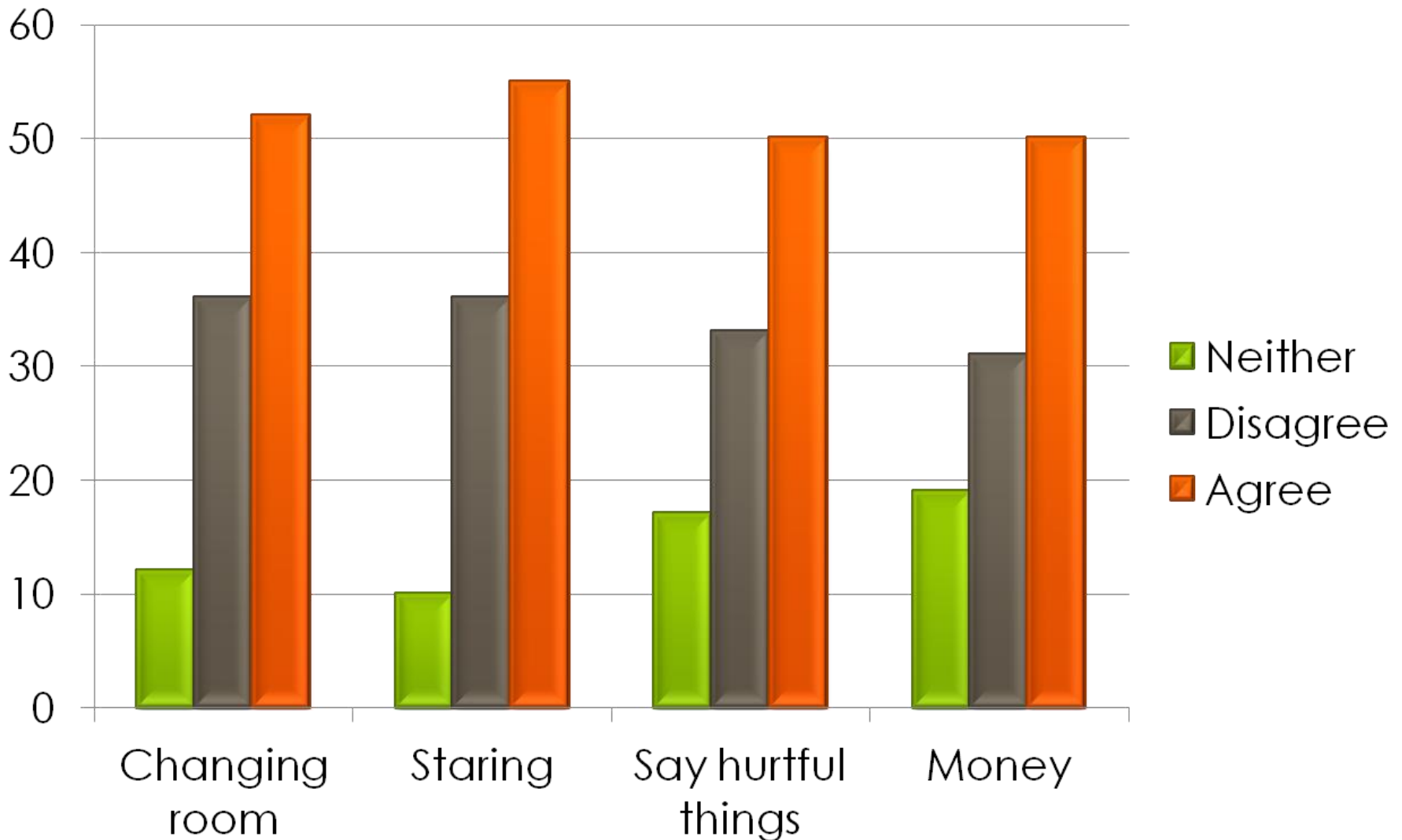
Current Worst (2013) 3/10
(& Less frequency)



Social Fear.. (Shame & Blame)



Results: Barriers for Gym Use



Reactions to stigmatizing language among parents:

Feel upset/embarrassed	42%
Seek a new doctor	35%
Avoid future medical appointments	24%

- *Challenges recommendations from Public Health Minister
- *The language that providers use about weight is important

Puhl, Peterson, Luedicke, *Pediatrics*, 2011. Puhl, Peterson, Luedicke, *Int J Obesity*, 2012.



Consequences for Physical Health

Weight Stigma:

- Avoidance of physical activity
- Lower motivation for exercise
- Cardiovascular health
 - elevated blood pressure
 - increased physiological stress
 - increased cortisol reactivity



Unhealthy Food Related Behaviours and Wt Gain

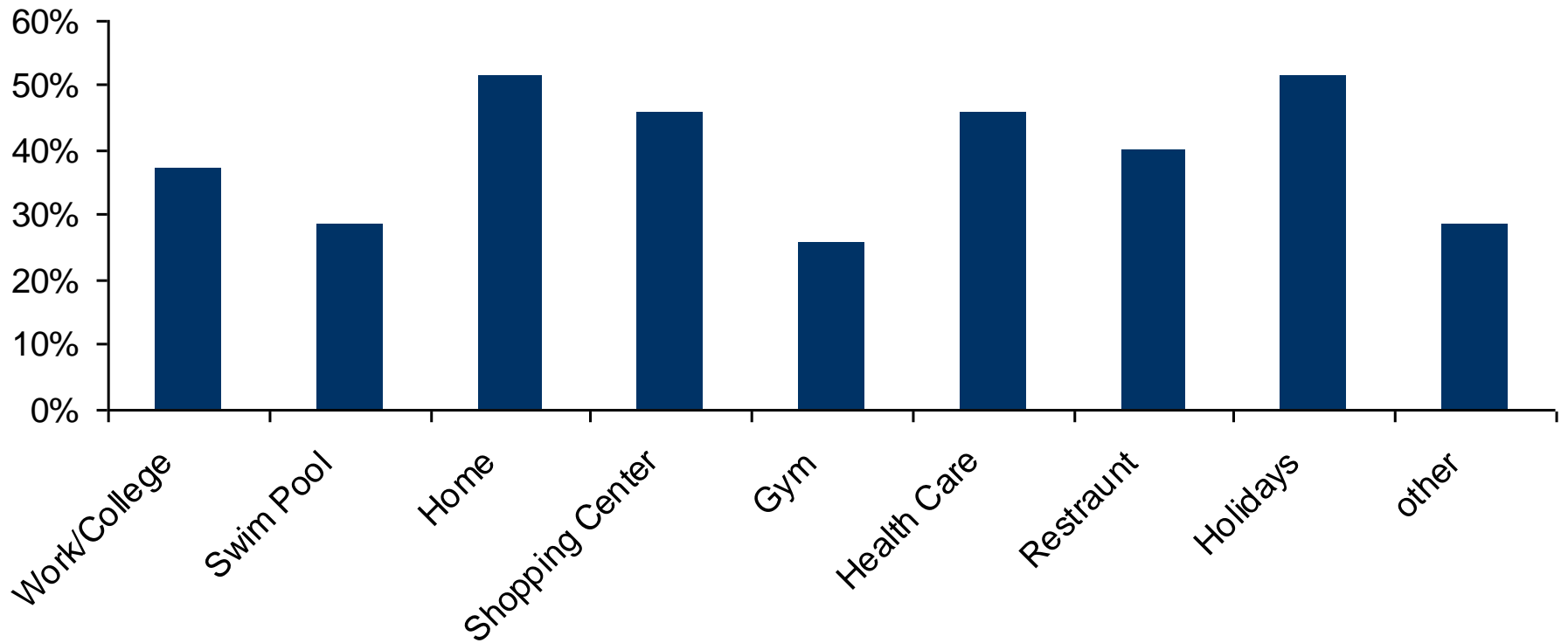
Bauer et al., 2004; Faith et al., 2002; Matthews et al., 2005; Schvey, Puhl, Brownell (under review); Schwimmer et al., 2003; Storch et al., 2006; Schmaltz, 2010; Seacat & Mickelson 2009; Vartanian & Shaprow, 2008; Vartanian & Novak, 2011.



YALE RUDD CENTER
FOR FOOD POLICY & OBESITY

Bad Attitude Survey SCH (2011)

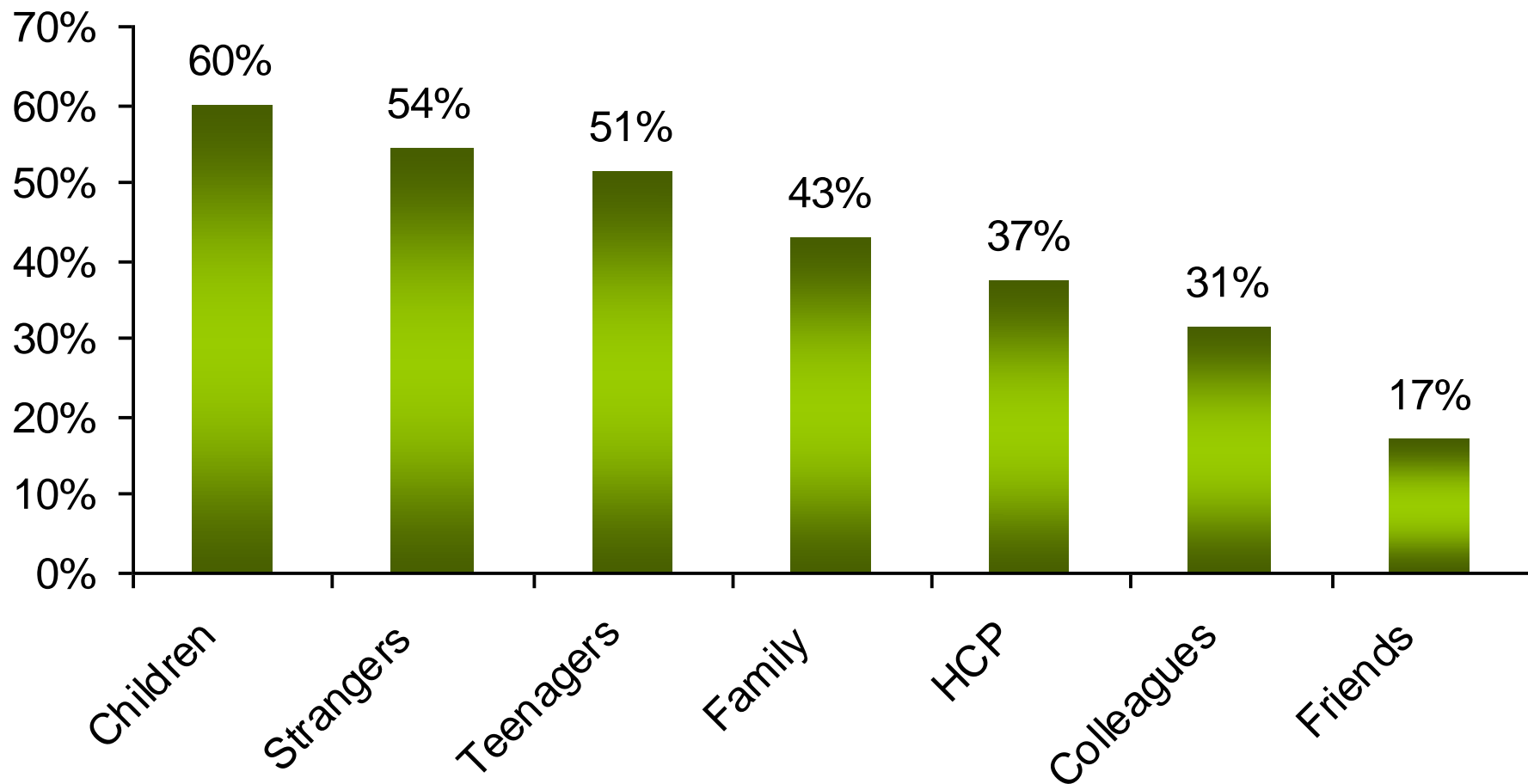
Where?

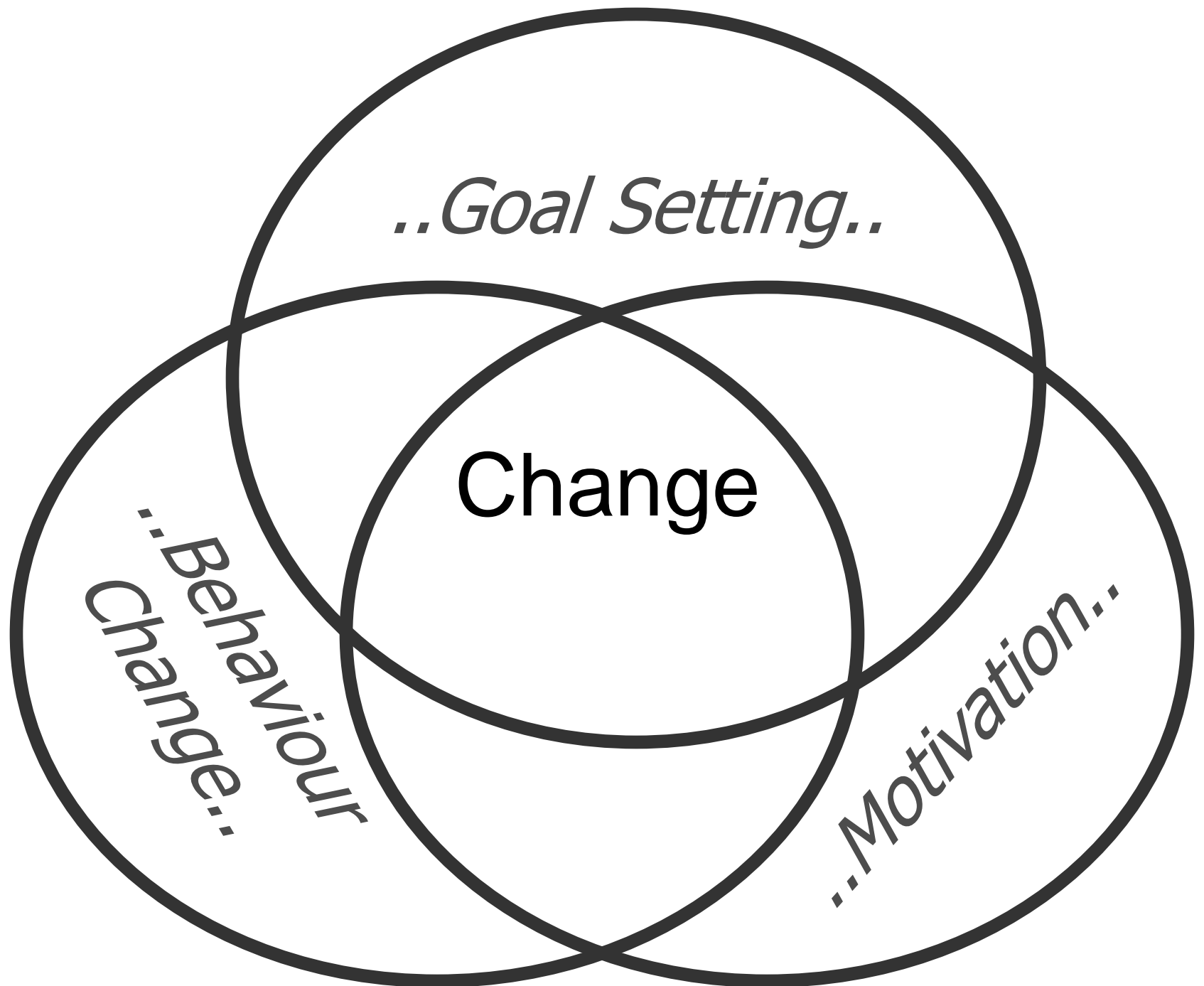


n=35 (F 19: M 16) Average Age: 44.9 yrs (SD: 11.8 yrs)
Average BMI : 44.1 kg/m² (SD 12.2)

Bad Attitude Survey SCH (2011)

Who?



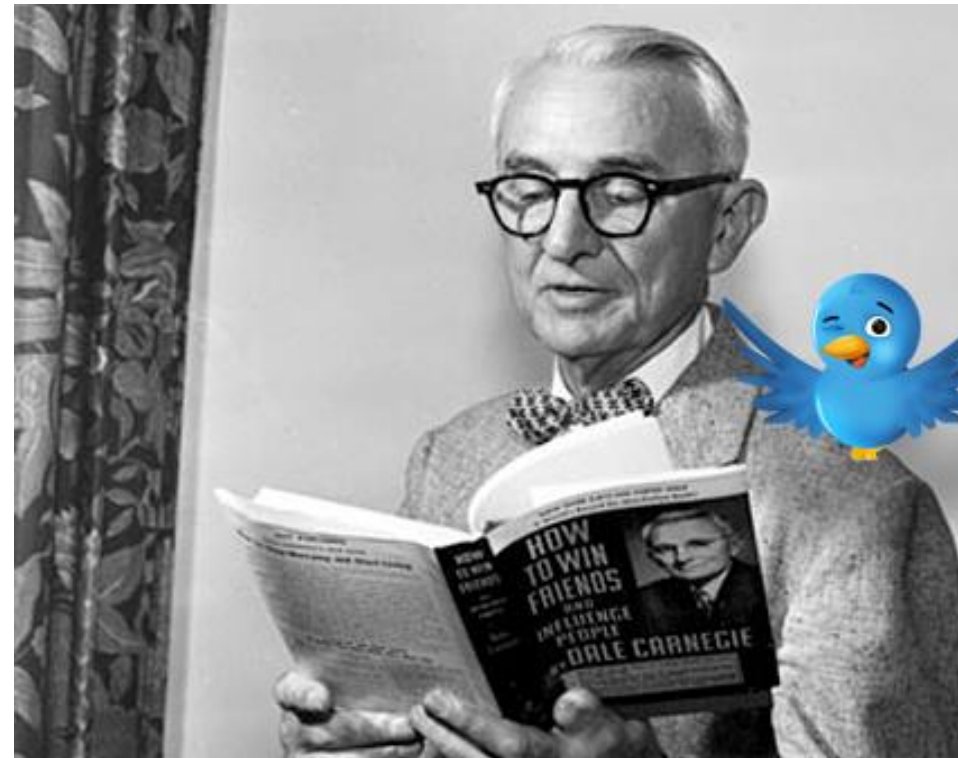


Fundamental Question..

Information
Providers

Vs

Facilitators
of Change



Psychological Theory and Behaviour Change

- 60 + different models...
- **Self-Determination Theory**
(... Psychological needs, autonomy, competence, relatedness)
- **Social Cognitive Theory**
(...Self-Efficacy) (Miller and Dollard, 1941, Bandura, 1977)
- **Theory of Planned Behaviour**
(... Volitional Control & Social Norm)
(Ajzen, 1985)



Important Point: No model more superior –
generic skills and competencies are important (NICE 2007)

Psychological Theory

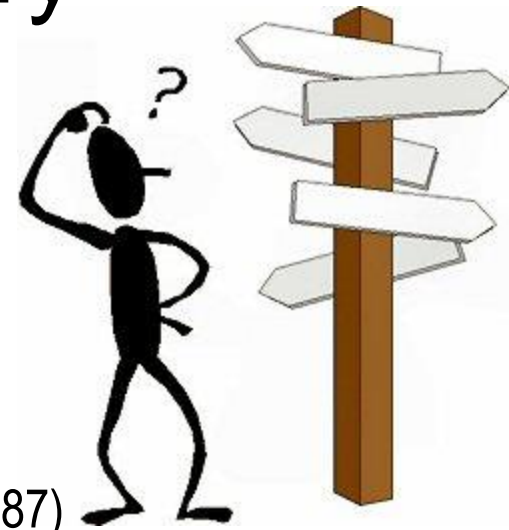
Goal Setting

- Multiple Models

- Theory of Symbolic Self-Completion
- **The Rubicon Model of Action Phases**

(Heckhausen & Gollwitzer, 1987)

- The Auto-Motive Model of Automatic Goal Striving
- The Mindset Theory of Action Phases
- The If-Then plan (Goal Intentions vs. Implementation Intentions)



*Your fun and easy guide to
the basics of human behavior*



Psychology FOR **DUMMIES®**



Adam Cash, PsyD
Psychologist

A Reference for the Rest of Us!™



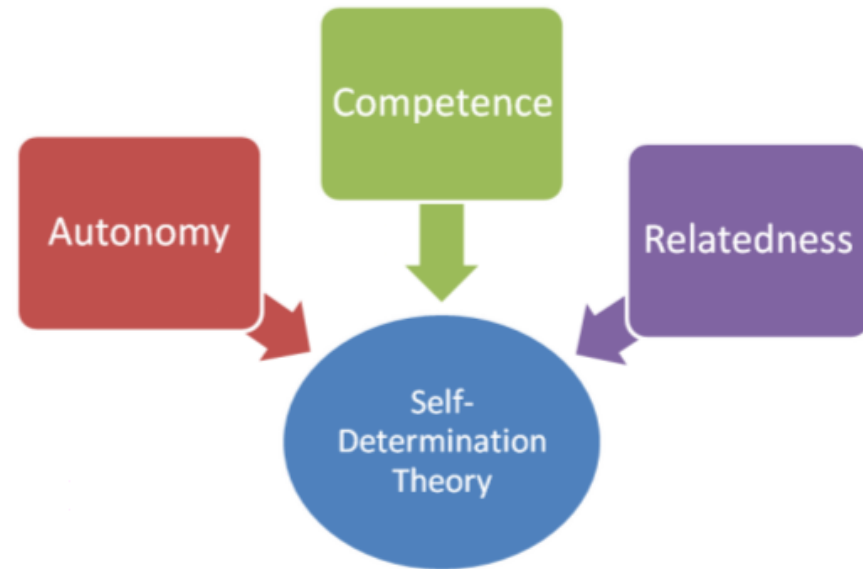
**FREE daily eTips
at dummies.com**

Road
Maps..

Self-Determination Theory

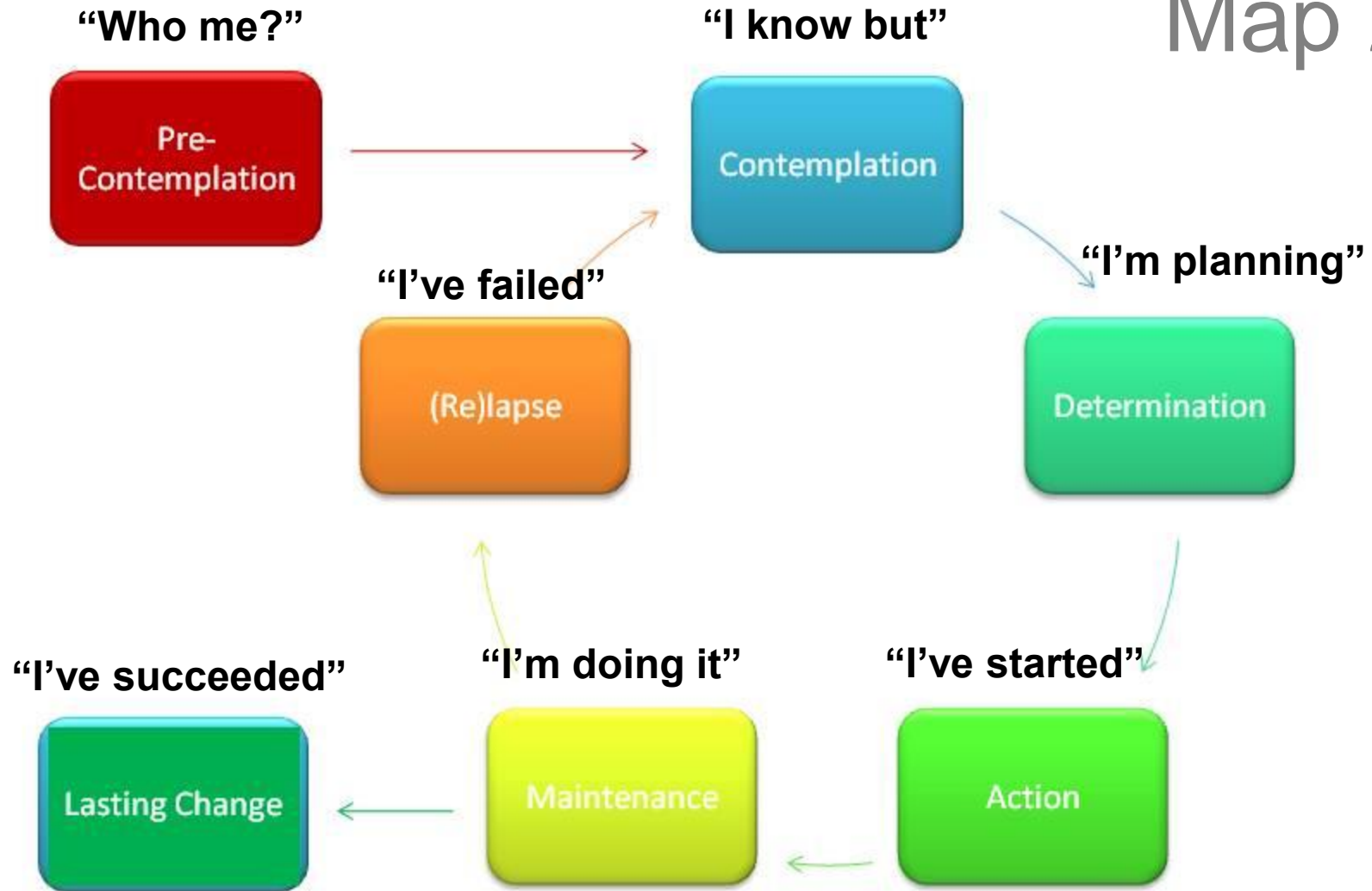
Road Map 1

- Autonomy
 - They'll make their own Decision ..
- Competence
 - The Decision they make will be the right one..
- Relatedness
 - What are the people in the social group doing?
 - Can they think of a role model?



Cycle of Change

Road Map 2

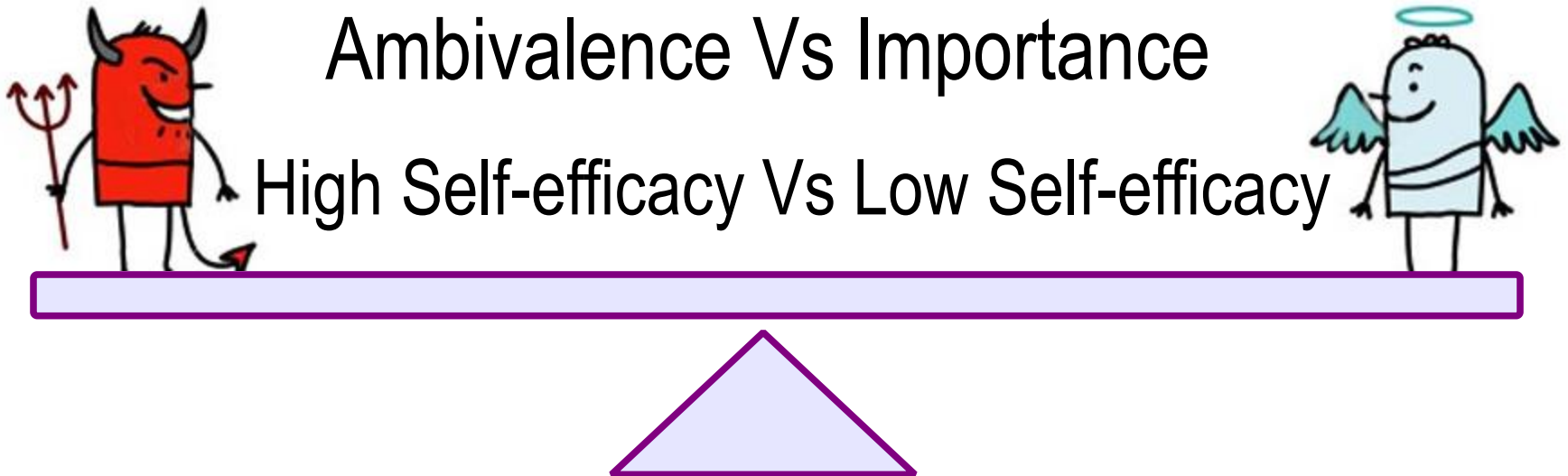


Prochaska and Diclemente Cycle of Change Theory (1982)

Decisional Balance

Road Map 3

“I know I should but it’s isn’t happening”



Ambivalence

- “I can live with it..
it’s who I am”
 - Personal &
Peer stereotype
 - “You can get used to anything..”
 - Persuasion
 - not effective at resolving ambivalence
 - “being told” often entrenches
- (Rollnick and Miller, 1995)



Ambivalence

- Interventions
 - “*Develop discrepancy*”
 - Discussion of the persons vision of who they are versus who they want to be..
- NB – Do not fill in the opposite side of the argument!



Self Efficacy

- “Belief in ones ability to succeed in a particular situation”
- Can be manipulated!
(McEvoy *et al*, 2013)
- Strong self-efficacy:
 - View challenging problems as tasks to be mastered
 - Develop interest in the activities (relevance)
 - Strong commitment to task
 - Cope well with setbacks and disappointments
- Weak self-efficacy:
 - Avoid challenging tasks
 - Beyond their capabilities
 - Focus on personal failings and negative outcomes
 - Quickly lose confidence



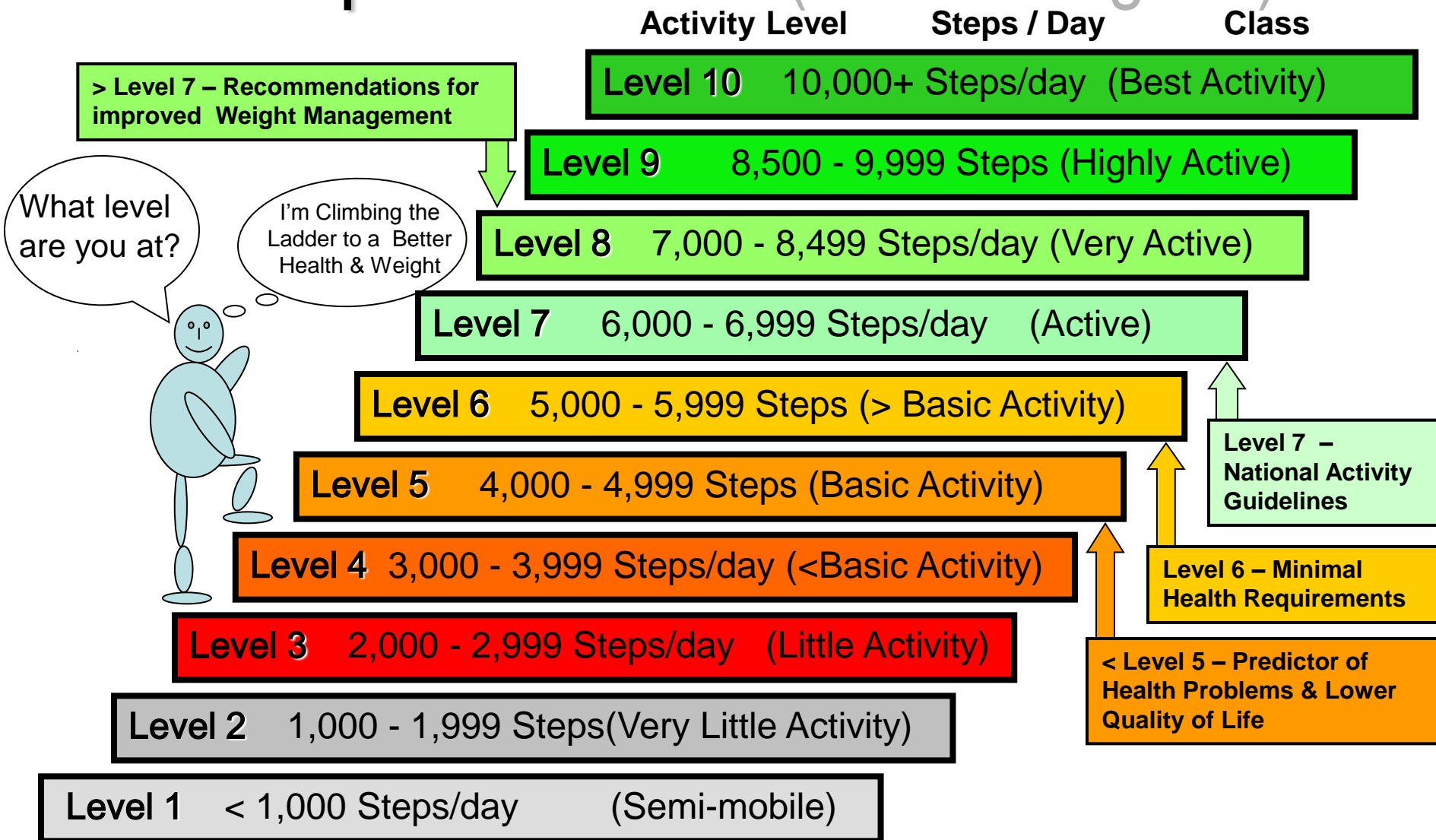
Self-Efficacy - Interventions

- **Mastery Experience** – Successfully completing a task (NB - Realistic Goals)
- **Vicarious Experience** – Seeing or hearing of others .. (NB - Social Relatedness, Role modelling & “Borrowing Self-efficacy”)
- **Social Persuasion** – the voice of others, “you can do it”, and discussing “how to’s..” (NB Expert assessment, advice and positive feedback)
“Make Every Contact Count”, St. James hospital (Sunderland and O’Hanlon, 2013)
- **Somatic and Emotional State** – Positive / Negative Mood (NB Right time, Right place, Right person)

Bandura 1997

The Step Ladder

(BMI > 40kg/m²)

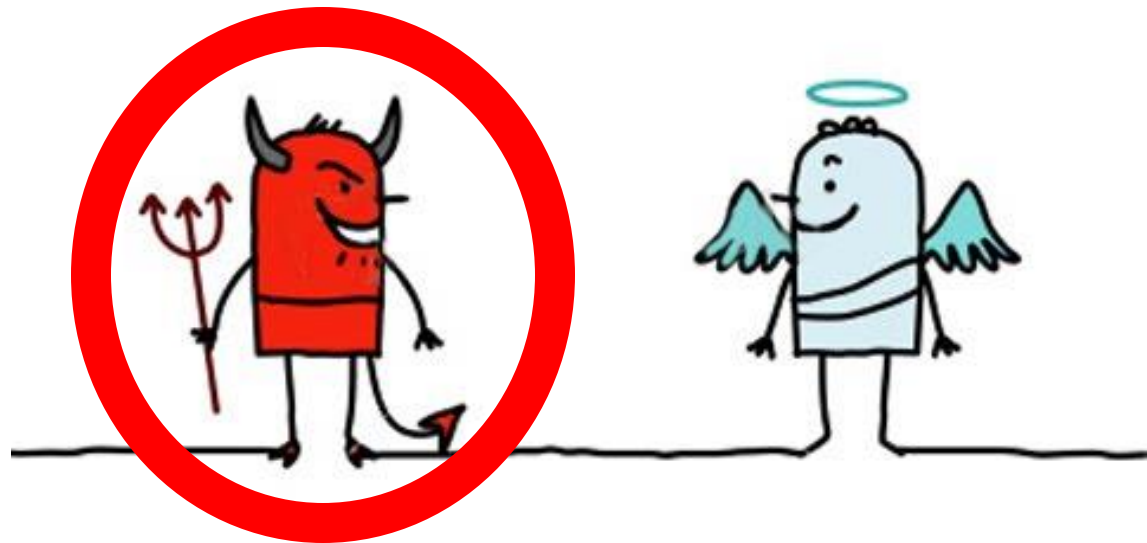


Baseline Activities taken to be 4,800 Steps/day Counts for Moderate Activity Only

This Chart is Based on Walking: To correct for other activities calculate 1 minute = 100 steps

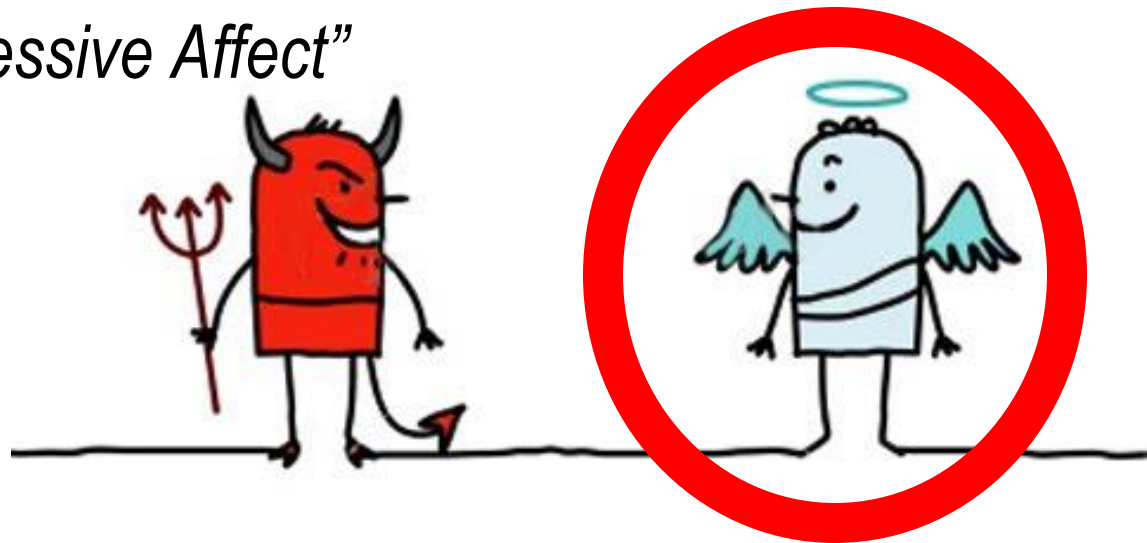
Avoidance Motivation

- Discrepancy enlarging behaviour
- Widen the gap between current and undesired state
- How to *Avoid* a bad state (avoid heart disease, etc)
 - Success => “*Relief*”
 - Failure => “*Anxiety*”



Approach Motivation

- Discrepancy reducing behaviour
- Close the gap between current and desired state
- How to *Approach* the goal (feel better, increase ability, *Enjoyment*)
(Griffin et al, 2013)
 - Success => “Happy Affect”
 - Failure => “Depressive Affect”





"What fits your busy schedule better, exercising one hour a day or being dead 24 hours a day?"

Is this the “*Living Room*” or
“*Dying Room*”?



Framework for Intervention

Road Map 4

- Ambitions/ Self perception
Complex issues....



- Performance Goals
Focused Goals & Imagined....



- Avoidance Goals
Probable outcomes (Long term)....



- Approach Goals
Definite outcomes (Short term)..<



Collaborative Approaches Work

- Meta-analysis (n=1504)
- Significant improvements

– Self-efficacy

– Physical activity level



(Niall McGrane, Rose Galvin, Tara Cusack, Emma Stokes, 2013)

The 4 E's

Road Map 5

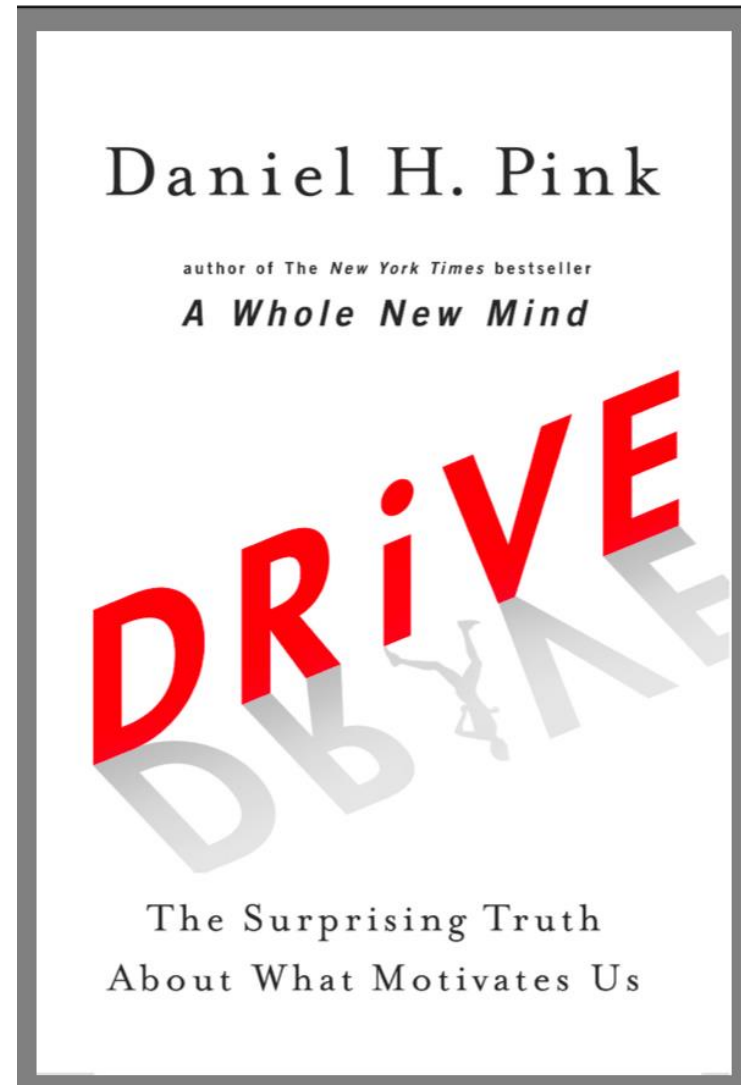
- Explanation - “the reason”
- Education - “the techniques”
- Empowerment - “the ability”
- Enjoyment - “the consistency”

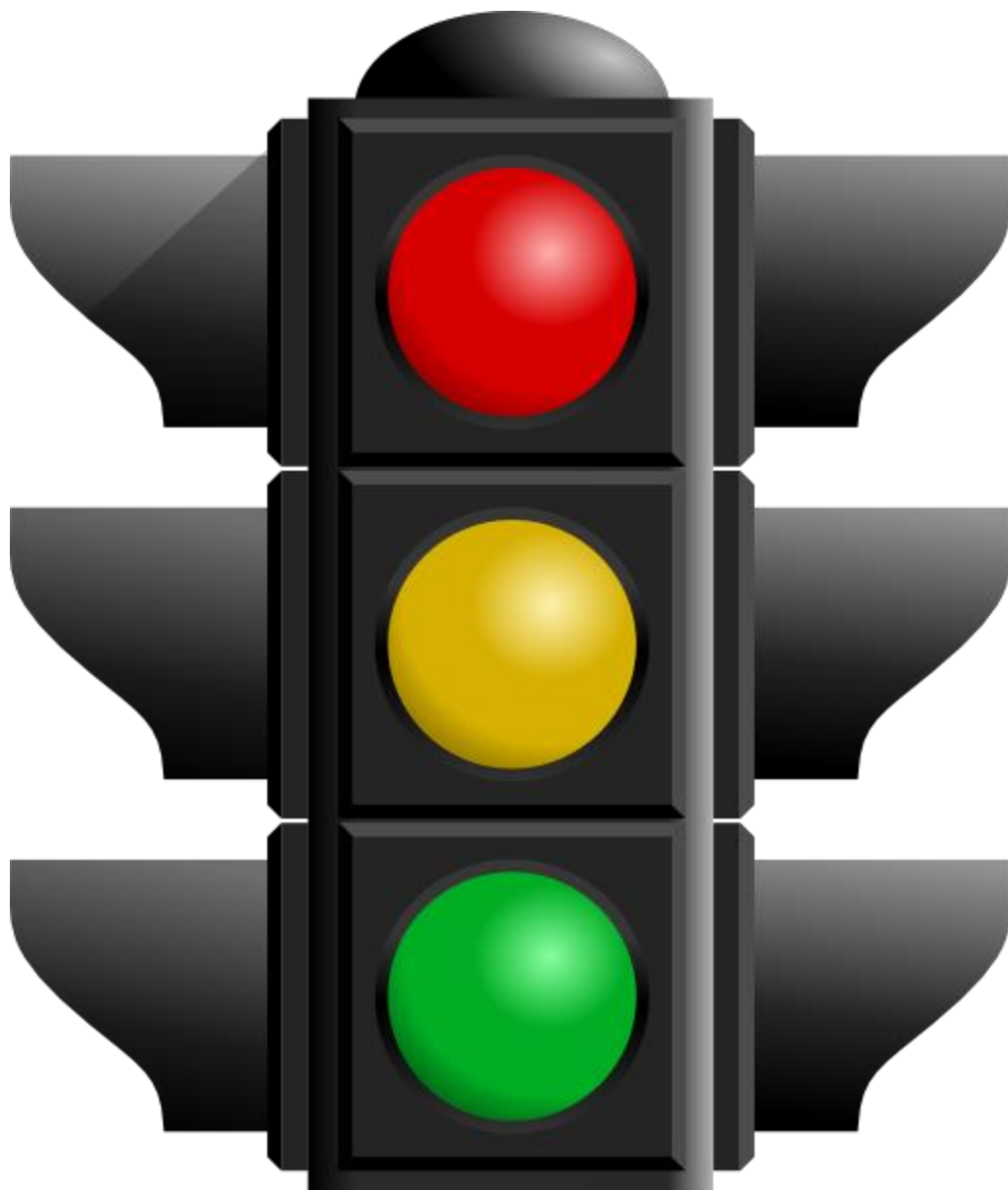
Summary (by Daniel Pink)

People are most motivated to change and maintain behaviours by...

1. (having) autonomy
2. mastery (self-efficacy) and
3. Purpose (~low ambivalence)

.... rather than incentives.





Workshop
Next...

Top Ten Evidence Based Traits of a Behavioural Change Programme

- Outcome Expectancy
- Personal Relevance
- Descriptive Norms
- Subjective Norms
- Personal & Moral Norms
- Positive Attitude
- Self-Efficacy
- Intension Formation
- Behavioural Contracts
- Relapse Prevention

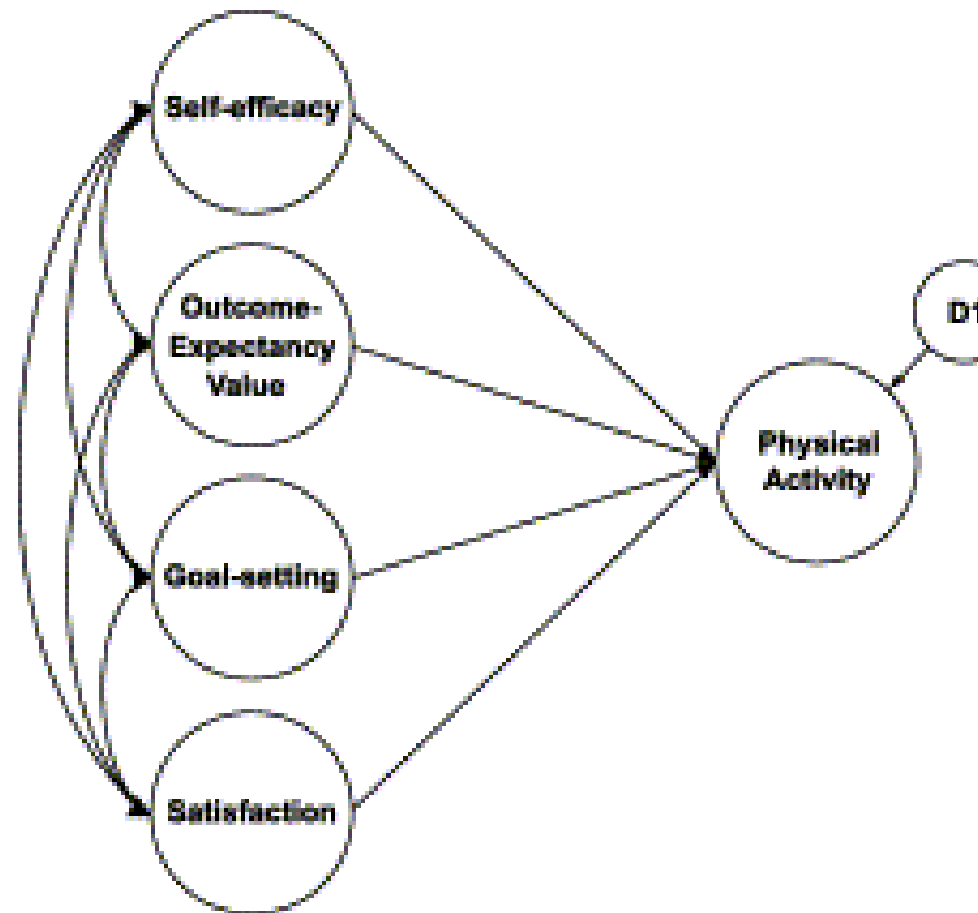
NICE Behavioural Change (2007)

Self Efficacy with Physical Activity

- Social-cognitive theory (SCT)

- control group n=1038
- experimental group n= 1049

“Manipulation of Self efficacy
directly increased PALs”
(*Dishman et al, 2004*)



Importance of Behavioural Theory

- Behavioural interventions
 - Without - 50% stop PA @ 6 months (r/v - 127 studies, n=131,000))
 - With - 25% Increased (Vs Control) PA @ 1 year (RCT, n=1442)
(*Dishman et al, 1996, 2009*)
- Self-Determination

Novice exercise groups @ 10 weeks, Significant increased attendance, enjoyment and internalisation. (RCT Exp.=25, Control=31)
(*Edmunds et al, 2008*)
- Volitional Control (Collaboration)
 - Enjoyment is stronger predictor than intrinsic and extrinsic needs
 - Feeling Autonomy and Competency (Self Determination) lead to persistence with task (& PALs).. (*Deci and Ryan, 2007, 2008*)

Who can choose successful Goals?

- Self perception..
 - Stereotypes & Behaviour of Social Group?
- Achievements..
 - Past
- Ambitions..
 - Future
- Role Models..



Sleep

- ~ 2 hours less sleep in last 50 years (US).
- Obesity & Short Sleepers
 - children (OR of 1.89)
 - adults (OR of 1.55; $p < 0.0001$)
- Exercise improves sleep/health
- Non-exercisers report worst sleep/health



(National Sleep Foundation (US) 2005, 2013, Cappuccio et al. 2008)