

Abnormal Psychology - Annette Hillers-Chen

Spring Semester 2018

Wed 9-12, Xianlin I-112

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## 6. Eating disorders



### Too slim? (1)



Recent Gucci  
advertisement (April  
2016):

Forbidden by the British  
Advertising Standards  
Authorities (ASA)

## Too slim? (2)

陈鲁豫/郭敬明



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## Too slim? (3)



"Venus at the mirror"

Peter Paul Rubens (1577-1640)



杨玉环

唐代



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## Thought stimulation



- What is the attitude in your family about food?
- What is your personal attitude?
- How do you usually have food at Nanda? How do you select what you eat?
- Have you ever been on a diet?
- How much do you move every day?

**What is normal eating behavior  
and normal weight?**

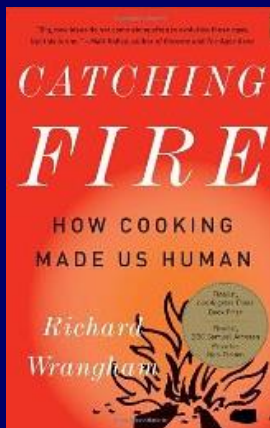


## Some ideas about food



- All cultures cook (no raw-diet culture).
- Human beings are omnivores (“all-eaters”).
- 20% of our daily energy is used by the brain (although: brain only < 5% of our body )
- Food needs to be absorbed first, otherwise it remains outside of the body.
- Before (in the mouth by saliva) and after absorption, it is metabolized by enzymes.

## Food as the origin of human kind



### *Raw-food diet*

Time necessary to provide enough energy for the brain of

- Chimpanzees: 7.3 hours/day
- Gorillas: 8.8 hours/day
- Humans: 9.3 hours/day

(Herculano-Houzel, 2011)

=> Processed food = more energy  
Processing food (cooking) made the development of mankind possible!

## Minnesota starvation experiment (1944/45)



- Research topic: Effects of starvation esp. with respect to re-nourishing post-war Europe
- Design ( $N = 36$ , male, 22-33 years of age)
  - *Control period*: 12 weeks, controlled 3200 calories/day diet
  - *Semi-starvation period*: 24 weeks, 1500 calories/day
  - *Restricted rehabilitation period*: 12 weeks, different sub-groups of re-nourishment
  - *Unrestricted rehabilitation period*: 8 weeks, normal intake but recorded

## Minnesota starvation experiment Most visible effects



- Loss of libido
- Emotional numbing
- Inability to concentrate
- Apathy, depression
- Tendency to isolate themselves
- **Obsession with food**
- Edema
- Lower pulse rate
- Lower body temperature
- Dizziness, tinnitus
- Extreme tiredness

# The body mass index (BMI)

$$\text{body weight (kg)} / [\text{height (m)}]^2$$



WEIGHT lbs	100	105	110	115	120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215
kg	45.5	47.7	50.0	52.3	54.5	56.8	59.1	61.4	63.6	65.9	68.2	70.5	72.7	75.0	77.3	79.5	81.8	84.1	86.4	88.6	90.9	93.2	95.5	97.7
HEIGHT in/cm	Underweight				Healthy				Overweight				Obese				Extremely obese							
5'0" - 152.4	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42
5'1" - 154.9	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	
5'2" - 157.4	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39		
5'3" - 160.0	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38		
5'4" - 162.5	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37			
5'5" - 165.1	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36			
5'6" - 167.6	16	17	17	18	19	20	21	21	22	23	24	25	25	26	27	28	29	29	30	31	32	33	34	34
5'7" - 170.1	15	16	17	18	18	19	20	21	22	22	23	24	25	25	26	27	28	29	29	30	31	32	33	33
5'8" - 172.7	15	16	16	17	18	19	19	20	21	22	22	23	24	25	25	26	27	28	29	29	30	31	32	32
5'9" - 175.2	14	15	16	17	18	19	20	20	21	22	22	23	24	25	25	26	27	28	29	30	30	31	31	
5'10" - 177.8	14	15	15	16	17	18	18	19	20	20	21	22	23	23	24	25	25	26	27	28	28	29	30	30
5'11" - 180.3	14	14	15	16	16	17	18	18	19	20	21	21	22	23	23	24	25	25	26	27	28	28	29	30
6'0" - 182.8	13	14	14	15	16	17	17	18	19	19	20	21	21	22	23	23	24	25	25	26	27	27	28	29
6'1" - 185.4	13	13	14	15	15	16	17	17	18	19	19	20	21	21	22	23	23	24	25	25	26	27	27	28
6'2" - 187.9	12	13	14	14	15	16	16	17	18	18	19	19	20	21	21	22	23	23	24	25	25	26	27	27
6'3" - 190.5	12	13	13	14	15	15	16	16	17	18	18	19	20	20	21	21	22	23	23	24	25	25	26	26
6'4" - 193.0	12	12	13	14	14	15	15	16	17	17	18	18	19	20	20	21	22	22	23	23	24	25	25	26

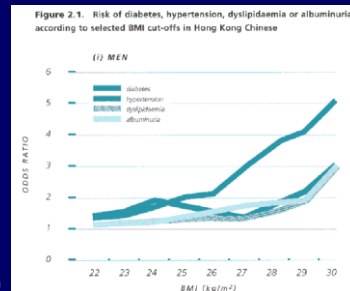


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## BMI standards: What is healthy?



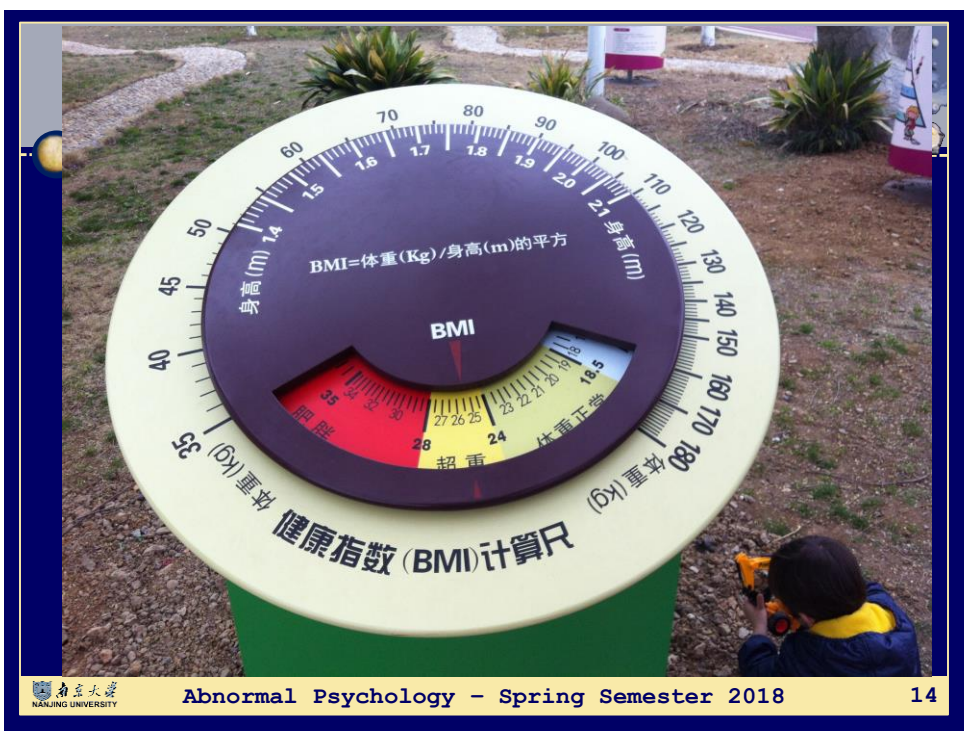
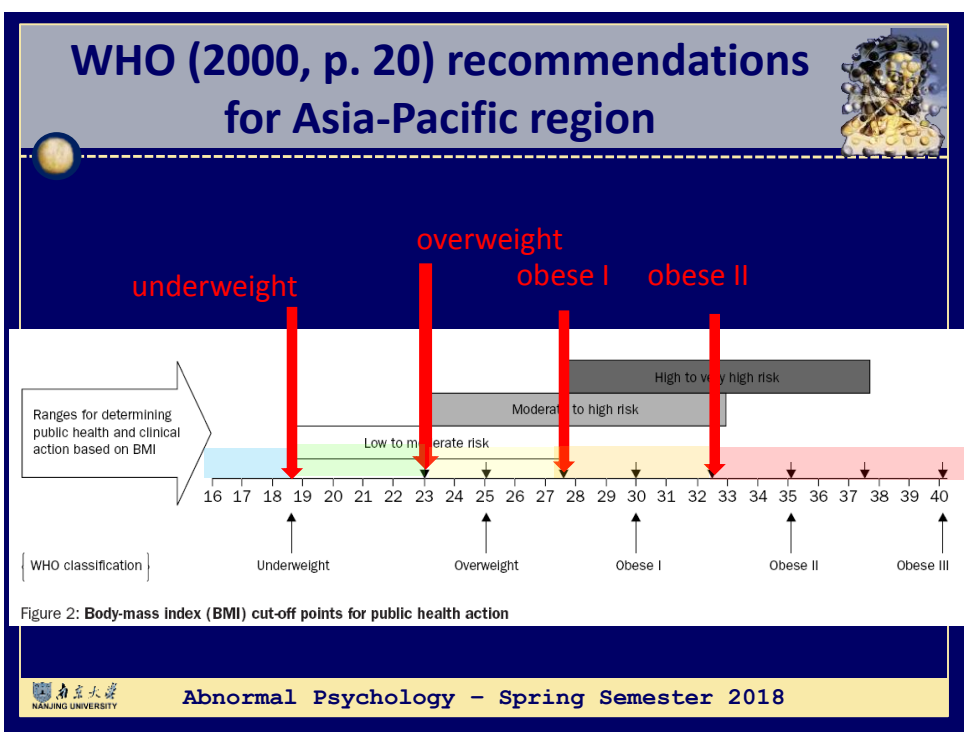
- Definitions of “healthy” vs. overweight vs. obese determined by risk assessments for various diseases and mortality (e.g., diabetes, hypertension)
- For China, WHO standards should be adjusted (*Lancet* 2004; 363: 157–63)
  - “underweight” < 18.5
  - “healthy” = 18.5-23
  - “overweight” = 23-27.5
  - “obese” >28
- Increases across life are normal! (WHO (2000, p. 16))



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# BMI is increasing around the world!

## NCD Risk Factor Collaboration (2016)

<http://www.thelancet.com/journals/lancet/article/PIIS0140-6736%2816%2930054-X/fulltext>

World

Age-standardised mean BMI (kg/m<sup>2</sup>)

Year

1980 1990 2000 2010

20 25 30

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# China's position (1) Obesity

## Note: Despite Western BMI standards!

Obesity in men 1975			2014		
Rank	Country	Millions of obese men (% of global obesity)	Rank	Country	Millions of obese men (% of global obesity)
1	USA	7.7 (22.5)	1	China	43.2 (16.3)
2	Russia	2.5 (7.4)	2	USA	41.7 (15.7)
3	Germany	2.0 (5.9)	3	Brazil	11.9 (4.5)
4	UK	1.7 (5.1)	4	Russia	10.7 (4.0)
5	France	1.4 (4.0)	5	India	9.8 (3.7)
6	Italy	1.4 (4.0)	6	Mexico	8.9 (3.3)
7	Ukraine	1.0 (2.9)	7	Germany	8.3 (3.1)
8	Poland	0.9 (2.7)	8	UK	6.8 (2.6)
9	Argentina	0.9 (2.7)	9	Italy	5.8 (2.2)
10	Brazil	0.9 (2.6)	10	France	5.6 (2.1)
12	Mexico	0.8 (2.3)	16	Argentina	3.8 (1.4)
13	China	0.7 (2.1)	17	Poland	3.6 (1.4)
19	India	0.4 (1.3)	19	Ukraine	3.1 (1.1)

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## China's position (2) Underweight



### Underweight in men

1975

Rank	Country	Millions of underweight men (% of global underweight)
1	India	61.4 (37.9)
2	China	29.6 (18.2)
3	Indonesia	7.4 (4.6)
4	Bangladesh	5.8 (3.6)
5	Pakistan	5.2 (3.2)
6	Japan	3.4 (2.1)
7	Vietnam	3.2 (2.0)
8	Nigeria	2.8 (1.7)
9	Brazil	2.7 (1.7)
10	Thailand	2.1 (1.3)
11	Philippines	1.9 (1.2)

13	Ethiopia	1.7 (1.1)
16	DR Congo	1.2 (0.8)

2014

Rank	Country	Millions of underweight men (% of global underweight)
1	India	101.8 (46.2)
2	China	18.0 (8.1)
3	Indonesia	11.9 (5.4)
4	Bangladesh	11.5 (5.2)
5	Pakistan	9.5 (4.3)
6	Vietnam	5.8 (2.6)
7	Nigeria	4.9 (2.2)
8	Ethiopia	4.9 (2.2)
9	Philippines	3.6 (1.6)
10	DR Congo	3.1 (1.4)

12	Thailand	2.6 (1.2)
13	Japan	2.4 (1.1)
18	Brazil	1.5 (0.7)



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## Limitations of the BMI: Proportion of body fat



- Ethnic differences exist with respect to body fat, e.g.,
  - Europeans more body fat than Americans for similar BMIs => "American" standard underestimates body fat of Europeans
  - Chinese (C) from Shanghai in NY vs. Americans (A) in NY:
    - BMI(C) < BMI(A)
    - Fat(C) > Fat(A)
- Different measurement methods and formulas of estimation, e.g. FFM (fat free mass)
- *But:* BMI provides convenient approximation of body fat



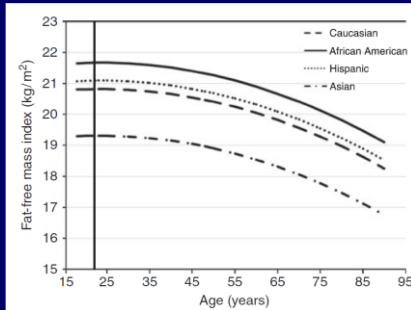
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## Fat free mass index across lifetime

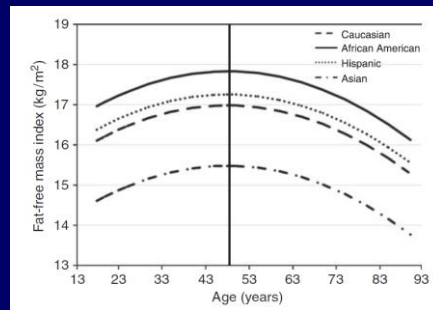
$$FFMI = (\text{fat free mass [kg]} / (\text{height [m]}))^2$$



### Males

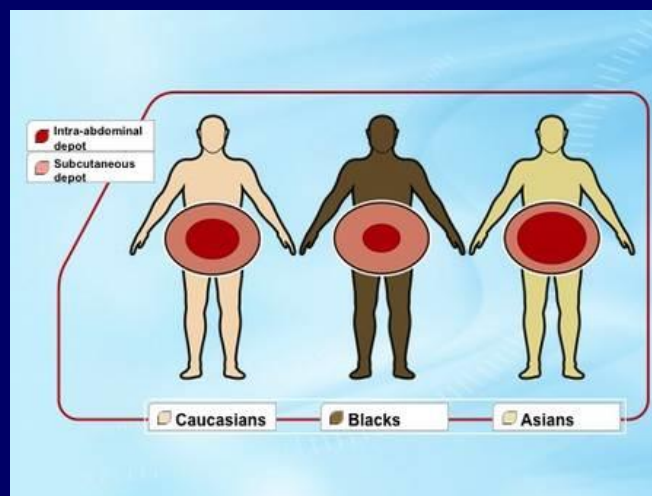


### Females




Hull et al. (2011)

## Ethnic differences of body fat distributions



## Body composition in male college students (He et al., 2015)

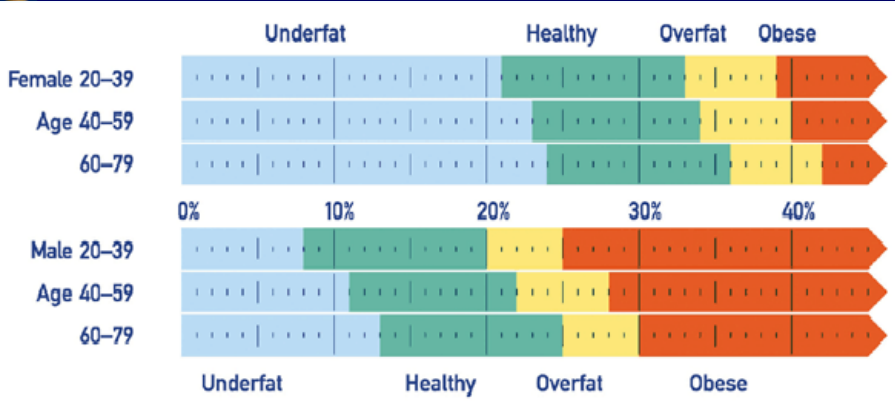
Body composition study <sup>d</sup>		
Data source	Zhejiang University	Columbia University
Number examined	399	76
Age, yr	50.5 (49.1, 51.9)	44.3 (40.7, 48.0)*
Weight, kg	66.4 (65.4, 67.5)	83.5 (80.8, 86.3)*
Height, cm	167.4 (166.8, 168.0)	178.3 (176.6, 178.9)*
BMI, kg m <sup>-2</sup>	23.7 (23.3, 24.0)	26.3 (25.4, 27.2)*
Percent body fat, %	20.7 (19.9, 21.4)	21.7 (19.7, 23.7)
Percent trunk fat, %	13.0 (12.5, 13.5)	11.5 (10.4, 12.7)***
Trunk to leg fat ratio	2.57 (2.50, 2.64)	1.63 (1.52, 1.74)*



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
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## “Normal” body fat percentage: Increases across lifespan!



NIH/WHO guidelines (2004)

Note: needs to be changed in order to be meaningfully used in China



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# Michael Phelps

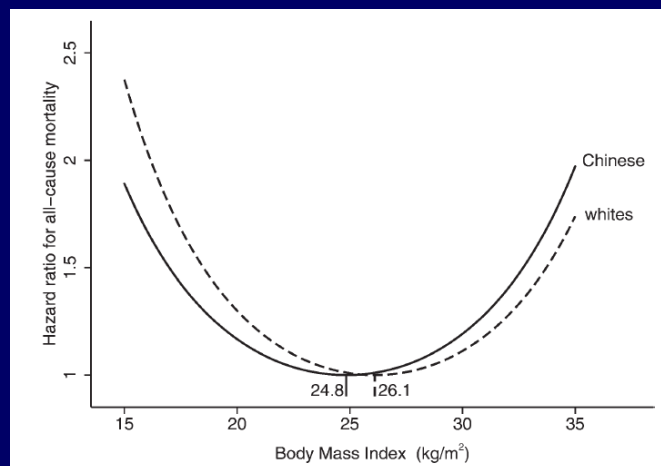


Estimated 7% body fat.



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## What is normal still under discussion!





He et al. (2015)






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
# Eating disorders


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## Eating disorders: Changes in DSM-5 (yellow)

- Main chapter: Eating **and feeding** disorder
- Anorexia
  - Amenorrhea not a criterion anymore
  - “significant low weight”
  - Added: **behavior that interferes with weight gain**
- Bulimia
  - Minimum **number of binges lowered**
- **Binge eating disorder (BED)**
- **Avoidant/Restrictive food intake disorder (rare)**
- **Pica and rumination disorder**


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## Anorexia Nervosa



- Intentional malnourishment: very low body weight below that of other people of similar age and gender;
  - Restricting type
  - Binge-eating/purging type
- Extreme fear of gaining weight or weight prevention measures despite low weight.
- Distorted body perception, inappropriate weight-related self-judgments, failing to see the serious health implications.

**Mild:** BMI  $\geq 17$  kg/m<sup>2</sup>  
**Moderate:** BMI 16–16.99 kg/m<sup>2</sup>  
**Severe:** BMI 15–15.99 kg/m<sup>2</sup>  
**Extreme:** BMI  $< 15$  kg/m<sup>2</sup>



## Bulimia Nervosa



- Repeated binge eating episodes: eating a huge amount of food within a short period of time
- Excess of compensatory behaviors (e.g., diuretics, forced vomiting, excess of exercise etc.) to prevent weight gain
- Weekly episodes  $>3$  months
- Inappropriate weight- and shape-related self-appraisal

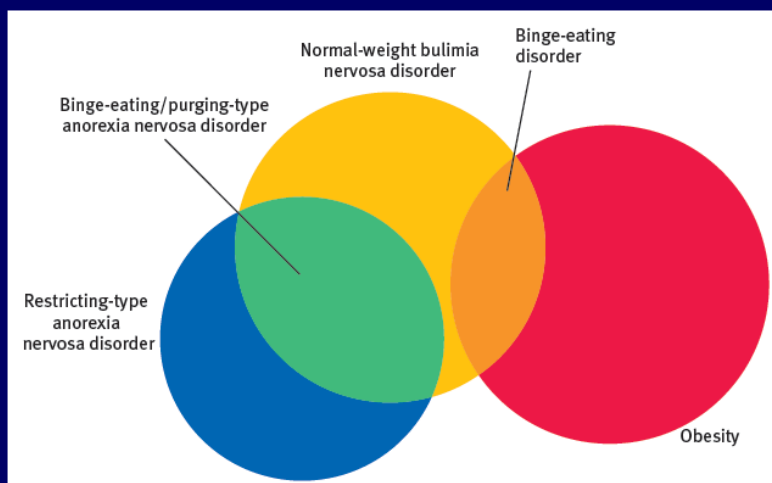


## Binge Eating Disorder



- Recurrent binge-eating episodes
- Binge-eating episodes include (min. 3 symptoms):
  - Eating fast
  - Eating without being hungry
  - Uncomfortable fullness
  - Secret eating (shame)
  - Self-disgust, depression, guilt afterwards
- Significant distress
- Weekly episodes > 3 months
- Absence of excessive compensatory behaviors

## Interrelations between eating disorders



## Physiological reactions due to eating disorders



- **Bulimia**

- electrolyte imbalance
- disrupted heartbeat
- kidney failure
- erosion of dental enamel

- **Anorexia**

- cessation of menstruation
- dry skin, brittle hair or nails
- sensitivity to cold
- lanugo

- **Binge Eating disorder**

long-term effects after having become obese (diabetes, high blood pressure, a range of heart diseases, etc.)



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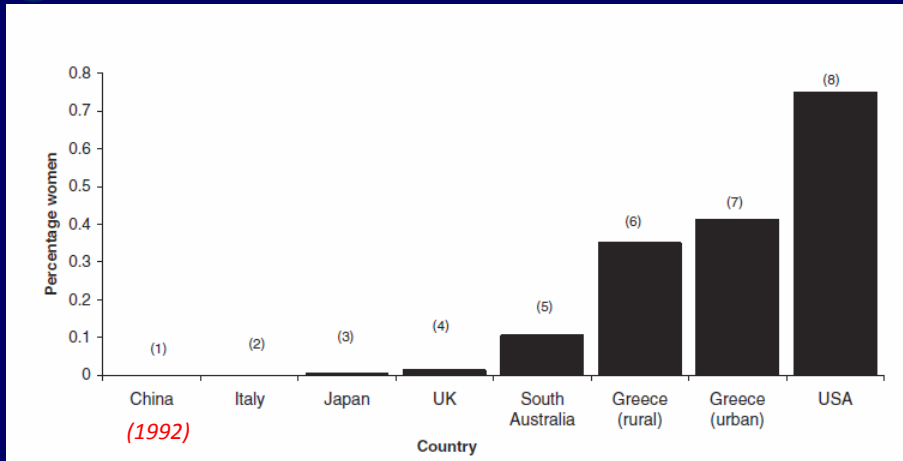
## Etiology of eating disorders

*"The stereotypical AN patient is depicted as young, North-European Caucasian, female, well-educated and from the upper socio-economic class."*  
(Sofi et al. 2006, p. 54)



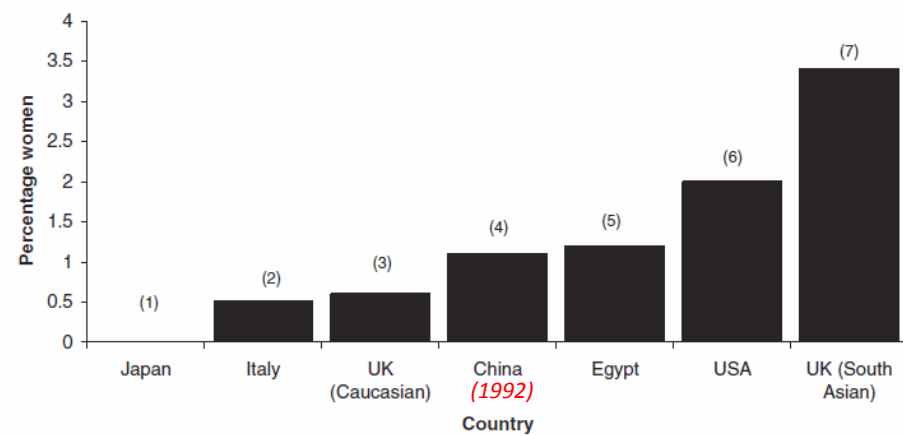
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## Prevalence of Anorexia in women (Soh, Touysz, Surgenor, 2006)

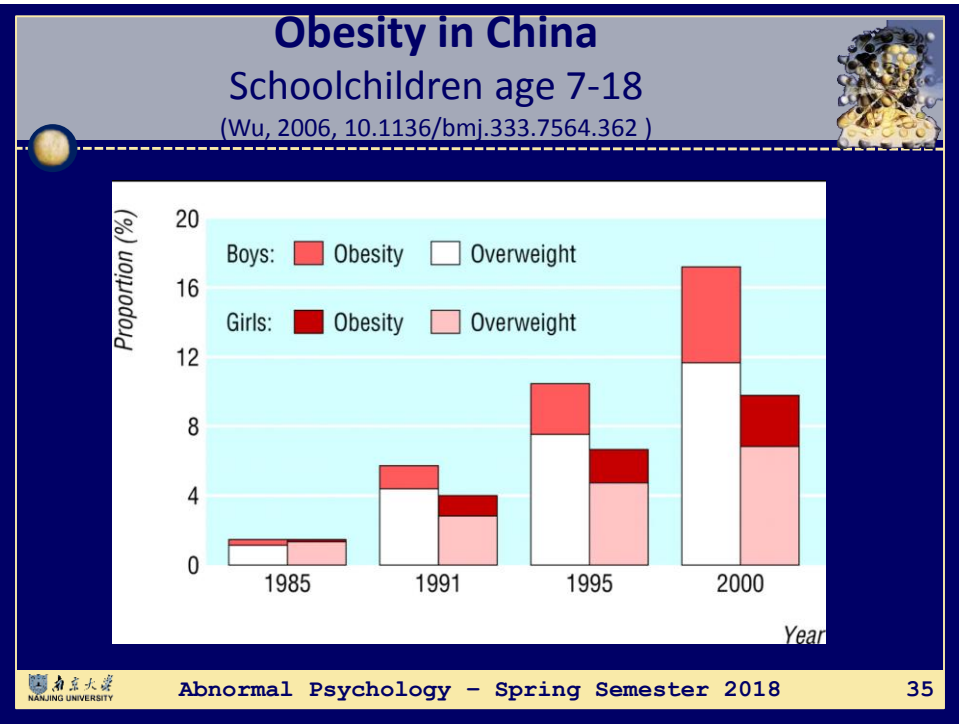


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## Prevalence of Bulimia in women (Soh, Touysz, Surgenor, 2006)



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### Prevalence of obesity in Shandong

(Zhang et al. 2012, p. 912, N  $\cong$  7200)

Age Range (Years)	1995	2005
<b>Boys</b>		
7.5-9.5	3.67	12.76 <sup>a</sup>
10.5-12.5	1.89	13.44 <sup>a</sup>
13.5-15.5	3.78	11.09 <sup>a</sup>
16.5-18.5	2.33	5.90 <sup>a</sup>
Total	2.92	10.78 <sup>a</sup>
<b>Girls</b>		
7.5-9.5	1.67	6.77 <sup>a</sup>
10.5-12.5	2.34	7.93 <sup>a</sup>
13.5-15.5	2.00	6.10 <sup>a</sup>
16.5-18.5	0.89	2.11 <sup>b</sup>
Total	1.72	5.76 <sup>a</sup>


Check the China Health and Nutrition Survey online for more information:  
<http://www.cpc.unc.edu/projects/china>


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## Etiological explanations (1)

### Set-point theory (Bennett & Gurin, 1982)


- biologically determined individual norm (= set point)  
“thermostat” based on various brain areas

=> body naturally wants to keep this pre-determined weight


- Dieting below the set point => “against the body”

#### Mechanisms of the body

- feeling of hunger
- decreased metabolic rate
- depression and lethargy to “save” energy



- AN and BN clients are constantly occupied with their diet
  - AN clients: learned to control (?) the thermostat
  - BN clients: battle with themselves continues

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## Etiological explanations (2)

### Biological factors



- Genetic risk: Concordance rate MZ/DZ twins
  - AN: MZ 67%, DZ 0% (Holland, 1989)
  - BN: MZ 23%, DZ 8.7% (Kendler, 1991)
 ⇒ some evidence for a genetic basis (still not conclusive)
- Biochemical explanations
  - *Low levels of serotonin* in the brain
    - indirect reasoning: antidepressants targeting at serotonin help also in AN
    - but: direction of the effect still unclear  
It "causes" eating disorders. OR It is a consequence of other disorders.  
OR Naturally given.
  - *Disrupted pattern of serotonin and dopamine* in the brain (results mixed)



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## Etiological explanations(3)

### Socio-cultural factors

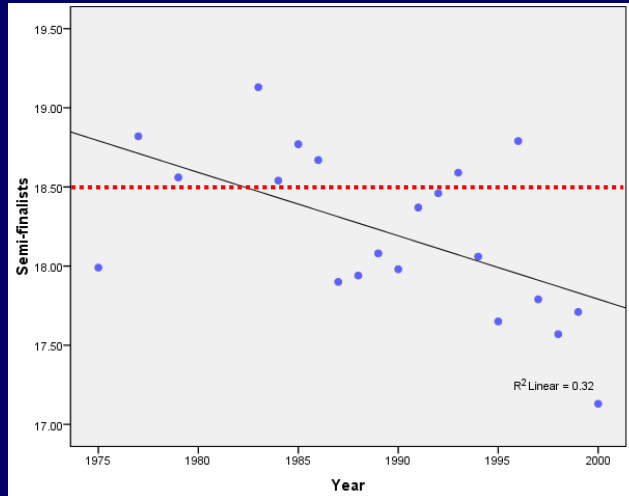


- **Thinness as an ideal within the society esp. among peers** (cf. examples 1-3)
- Body weight as an indicator of moral behavior
- Weight and shape as a central topic within one's family
- **Changing socio-cultural habits (China; example 4)**



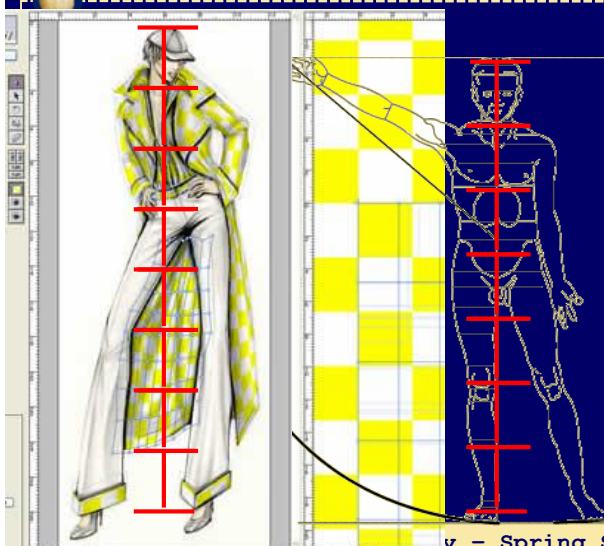
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### Example 1: BMI of Miss Hong Kong Semi-finalists 1975-2000 (Leung et al., 2001)



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### Example (2) Ideals – body proportions



- 7-7.5 heads from head to heel
- 4 heads from hip to toes

*Hence:*

Design pictures distort proportions and make the model look better artificially!

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## Example (3): Computer makeovers



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## Example 4: Li, Adab, & Cheng (2015): Grandparents as caregivers



*'My mother loves seeing my daughter getting big...I said not so much meat and snacks and she should learn swimming but she doesn't understand and thinks I am wrong...'* (A mother from middle class in GZ).

*'I said to my son you need to lose weight, he replied that grandma said I am just strong...only you want me to'* (A mother from lower class in GZ).

Risk for  
overweight/obesity:

OR = 1.13-3.47

*'I told my boy his diet needs some improvement...my mum said she is happy with his diet, pretty healthy... not picky, not wasteful... eats almost everything...eats enough meat and enough oil is used in cooking...'. 'In their time, meat and oil were treasures so now they feel the more the better'. I decided to move out with my wife and son...his grandparents were a big problem...we couldn't change anything when we lived together'.*



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## Etiological explanations (5) Psychological factors



- Weight-related self-schema (self-worth defined via weight)
- Dieting as reinforcement (example 5)  
Compliments, concern/attention, scales as indicators for "control", relief of fear (negative reinforcement)
- Mediator: negative affect (but less in China)
- Anorexia: distorted body image (cf. example 6)
- Dispositions: perfectionism



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## Example (5a) Pro-Ana movement

**Navigation**

**FO Insider**

- About Us
- History
- Webmistress
- Forum
- Updates
- Contact Us

**Information**

- Acronyms
- Anorexia Definition
- Anorexic Dangers
- Bulimia Definition
- Bulimic Dangers
- EDNOS Definition
- Binge ED
- Compulsive Exercise
- Pro-Ana Definition
- Statistics

**Charts**

- Food
- B.M.I.
- Height Weight
- Model

**Calculators**

- B.M.I.

**57 Reasons**

01. You will be FAT if you eat today, just put it off one more day.
02. You don't NEED food.
03. Fat people can't fit everywhere.
04. Guys will be able to pick you up without struggling.
05. You'll be able to run faster without all that extra weight holding you back.
06. People will remember you as "the beautiful thin one".
07. If someone has to describe you, they'll say "oh she weighs like 90, 100 lbs".
08. Guys will want to get to know you, not laugh at you and walk away.
09. Starving is an example of excellent willpower.
10. You will be able to see your beautiful, beautiful bones.
11. Bones are clean and pure. Fat is dirty and hangs on your bones like a parasite.

**Navigation**

**Diets**

- 3 A Day Fruit
- 3 Day Diet
- Bread & Butter
- Cabbage Soup
- Caroline Kettlewell
- Chicken Soup
- Marya Hornbacher
- Mixed Carb 400
- Rainbow
- Russian Gymnasts
- Super Oatmeal
- Vegan Model

**Exercises**

- Erin Brockovich
- Toning Exercises
- Tummy Exercises
- Mandi's Workout

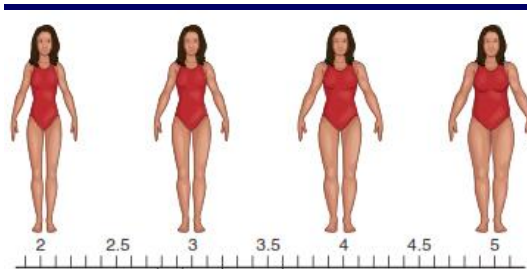
**Recipes**

- Banana Brownies
- Banana Nut Bread
- Cabbage Soup
- Chicken Soup
- Choc Brownies
- Faux Pizza

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## Example (5b) Pro-Ana movement

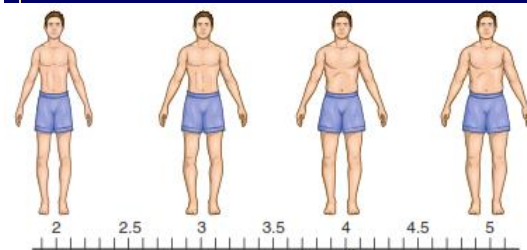
- Movement on the internet, playing down the problematic aspects of the disorders
  - Anorexia becomes personalized ("Ana")
  - "Eating" is defined as an enemy
  - Pictures of underweight women as ideals
  - Tricks provided how to diet and how to hide the disorder
  - Chatroom to exchange difficulties, e.g.,  
„Man today was a bad day!!! I ate half a ham sandwich (I threw up what I could) 1/2 c. minestrone broth ( I only ate the broth of the minestrone soup), 5 skittles!!!! I'm not happy with myself right now!"
  - But: also general information provided (to dissociate with the actual movement)
- Dangerous, because misinformation is being spread!



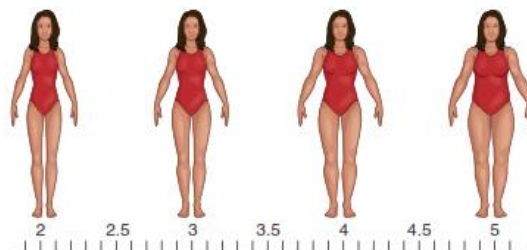
### Example 6 (a)



- Which shape is the most attractive to you?
- Which picture corresponds to your current body shape?
- What is your ideal body shape?
- Which shape is most attractive to you for the opposite gender?



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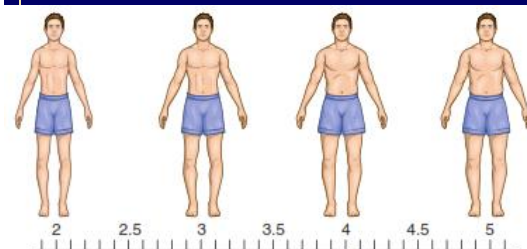


### Example 6 (b)



Conflict between real and ideal body shape especially obvious in women's ratings.

Fallon & Rozin (1985)



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## Etiological explanations (6)

### Family environment



- Enmeshed family pattern (Minuchin): overinvolvement
  - Ineffective parenting (Bruch): misinterpretation of child's needs => child unaware of his/her own needs (e.g. hunger)
  - "Food" as the only family topic to relate
- But: High variability in family patterns!  
("anorectic family" concept out of date)



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## Treatments Eating Disorder



- Anorexia
  - First target: **weight gain**
  - Reinforcers for eating, security not to become overweight
  - However: >20% show no change later, 6% die from starvation;
  - Secondly: cognitive and behavioral change
  - Generally difficult admission and poor prognosis (16% fatal long-term effects)
- Bulimia
  - 3 steps: goal setting, regaining eating structures, maintenance
- BED
  - Psychoeducation, food counseling, sports



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## What is a normal portion?

Important: not counting calories!



## Ethical question

Are patients mentally capable of denying treatment even if a consequence may be death?

## Thought stimulation



- Compare the amount of food and drinks that are served with a normal “extra value meal” at McDonald’s in three countries:
  - The US
  - One European country
  - China
- What are the differences?