Variants of Utility

Two concepts of utility

❖ Modern usage: *Decision utility*

➢ inferred from choices, explains choices

❖ Bentham/Edgeworth: *Experienced utility*

➢ the quality and intensity of hedonic experience

❖ Arguments against study of Experienced Utility

➢ superfluous -- agents are rational

➢ impossible   -- experience is private

The view from psychology

❖ ***The measurement of experienced utility is both useful and feasible***

❖ Interpersonal comparisons are not impossible

  ➢ Similar brains → similar sensations

❖ Fair interpersonal agreement on psychophysical functions:

  ➢ sound pressure → loudness

  ➢ pressure of labor contractions → pain

❖ The adoption of experienced utility as a topic opens an agenda for psychological research, and perhaps eventually for a conversation with economics

Elements of a research agenda

1. **The logic of experienced utility**
   from moments to episodes

2. **The psychology of remembered utility**
   evaluation of episodes by moments

3. **Decisions that do not maximize utility**
   adding a better end

4. **Adaptation neglect in forecasts of utility**
   transitions as proxies for states

5. **Well-being and experienced utility**
   exploring the hedonic treadmill

1. The logic of Experienced Utility:

From moments to episodes

The hedonic dimension

❖ Each moment of experience is characterized by an affective/hedonic state

❖ The underlying scale consists of two distinct limbs joined by a distinctive zero: *neither good nor bad*.

❖ ***Moment utility*** comprises an affective reaction **and** an action tendency:
  ➢ **continue** or **stop**
  ➢ **approach** or **avoid**

The utility of outcomes that extend over time

❖ **Moment utility**.

➢ "Are you in pain now?"

❖ Global *remembered utility* of episodes

➢ "How much did you suffer altogether?"

How to assess the *total utility* of episodes:

❖ Accept subjective reports of moment utility
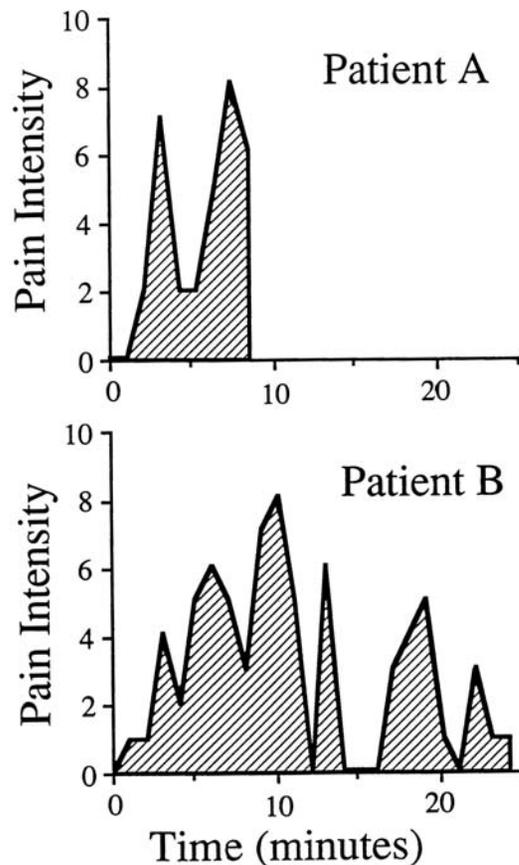
❖ Avoid global subjective reports

➢ fallible memory

➢ problematic aggregation

❖ *The total utility of an episode is <u>constructed</u>, from a profile of moment utility*

Who suffered more?

Patients undergoing colonoscopy reported their pain every 60 sec.

"How much did these patients suffer?"

The question is asked from the perspective of an objective observer

It requires an assessment of the **total utility** of episodes, from profiles of moment utility

The logic of total utility
(Kahneman, Wakker, Sarin, 1997)

**Conditions on the measure of moment utility:**

❖ _inclusiveness:_ must contain _all_ the information relevant to total utility, including hedonic effects of anticipation and memory

❖ _intrapersonal comparability_ across experiences

❖ _ordinal measurement_ on both sides of zero

❖ _interpersonal comparability_

Principles for the evaluation of total utility:

❖ _time-neutrality_: all moments are weighted equally (no discounting, etc.)

❖ _separability_: the order of _moment utilities_ does not affect their contribution to total utility

The decumulative representation

❖ A <u>temporal decumulative</u> representation provides a *<u>partial</u>* order of total utility

➤ patient B suffered strictly more than patient A

❖ Individual profiles summed to create group profile
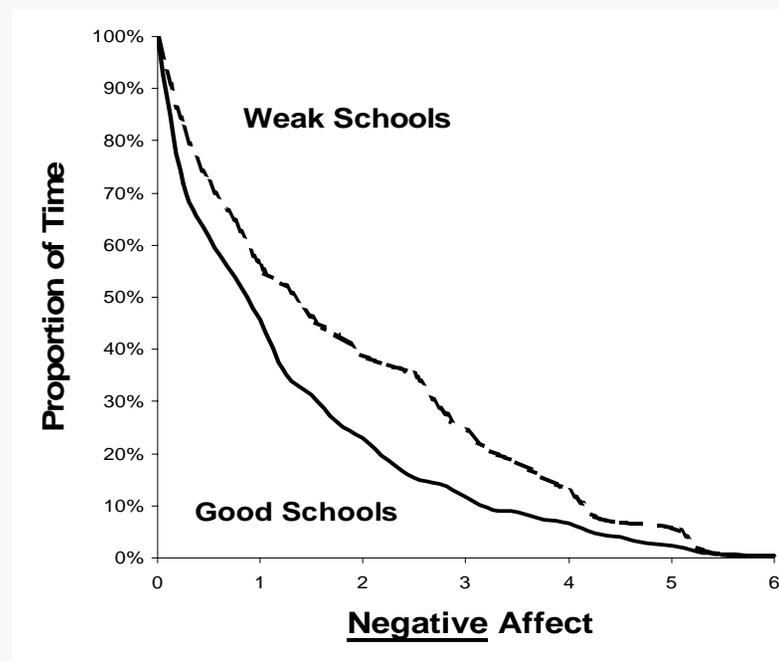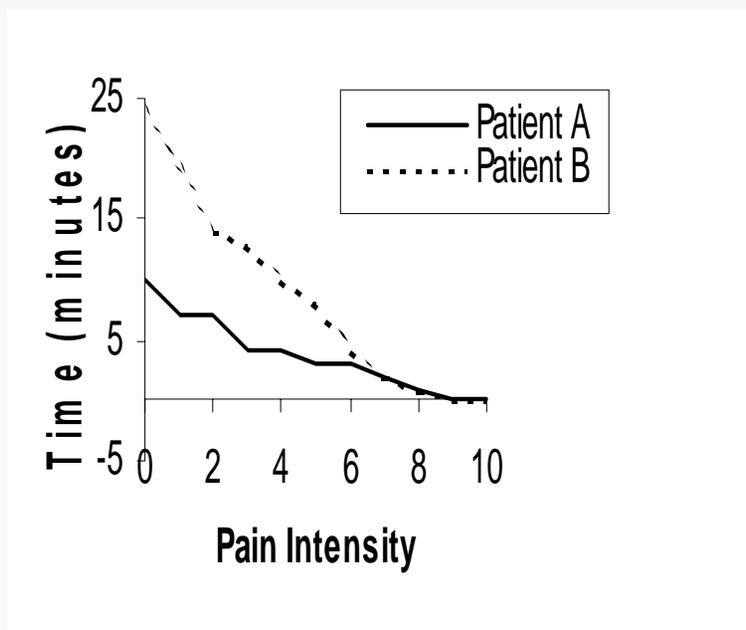
2. The psychology of remembered utility:

Evaluation by representative moments

The valuation of extended outcomes

❖ ***The utility of <u>moments</u> commonly serves as a proxy for the utility of <u>states</u> or <u>episodes</u>***

❖ Transitions (e.g., moving to California) are proxies for temporally open-ended states

❖ Representative moments are proxies for complete episodes, e.g., colonoscopy or vacation

Remembered utility of a colonoscopy
(Redelmeier and Kahneman, 1996)

Predictors of Retrospective Global Ratings

Peak+End	.67
Duration of procedure	.03

❖ The representative moment is a composite, which weights two singular moments: Peak pain and End

❖ Little effect of duration in this study

Peak+End rule and Duration Neglect

❖ Good approximation, supported with both abstract and real stimuli

➢ Fictitious profiles of pain

➢ Life trajectories (Diener et al)

➢ Films, sounds, pressure pain (Ariely)

❖ Duration neglect in lower animals: the fear of an electric shock is independent of its duration

❖ The weight of duration is increased by directing attention to it (Ariely & Loewenstein, 2000)

❖ The Peak + End rule entails violations of dominance

3. Decisions that do not maximize utility:
Adding a better end

Violations of dominance

Kahneman, Fredrickson et al, 1993: On two trials, separated by seven minutes, participants immerse a hand in cold water until instructed to remove it. Seven minutes after the second trial, they are called for a third trial and are asked which of the two trials they want to repeat.

Short: 60 sec at 14°C

Long: 60 sec at 14°C + 30 sec → 15°C

65-80% prefer Long

This is not an isolated finding

Remembered utility → Decision utility

❖ **"Choosing by liking"** -- a non-analytic strategy of choice, selects the option most liked or least disliked

❖ Closely related to Paul Slovic's **affect heuristic**

❖ *Choosing by liking maximizes the anticipation of remembered utility*

❖ *but not necessarily the utility actually experienced*

❖ These (and other) failures to maximize experienced utility are **systematic and predictable** consequences of familiar psychological principles

4. Adaptation neglect in affective forecasts:

The transition heuristic

Changes as proxies for states

❖ A generalization of prospect theory: An anticipated emotional reaction to a ***transition*** often serves as a proxy for the utility of the end state

❖ ***This 'transition heuristic' ignores the likelihood of adaptation to the new state***

❖ Blindness to adaptation has been explored by several researchers (Gilbert et al; Loewenstein)

❖ Gilbert et al (1998)

➢ the response to election results

➢ the response to tenure decision

Misprediction of adaptation

(Beruria Cohn, 1999)

Survey participants were asked to estimate the % of time that various classes of persons spend in good, neutral or bad mood, e.g., paraplegics and lottery winners, one month or one year after the event. Respondents were also asked if they knew a case personally
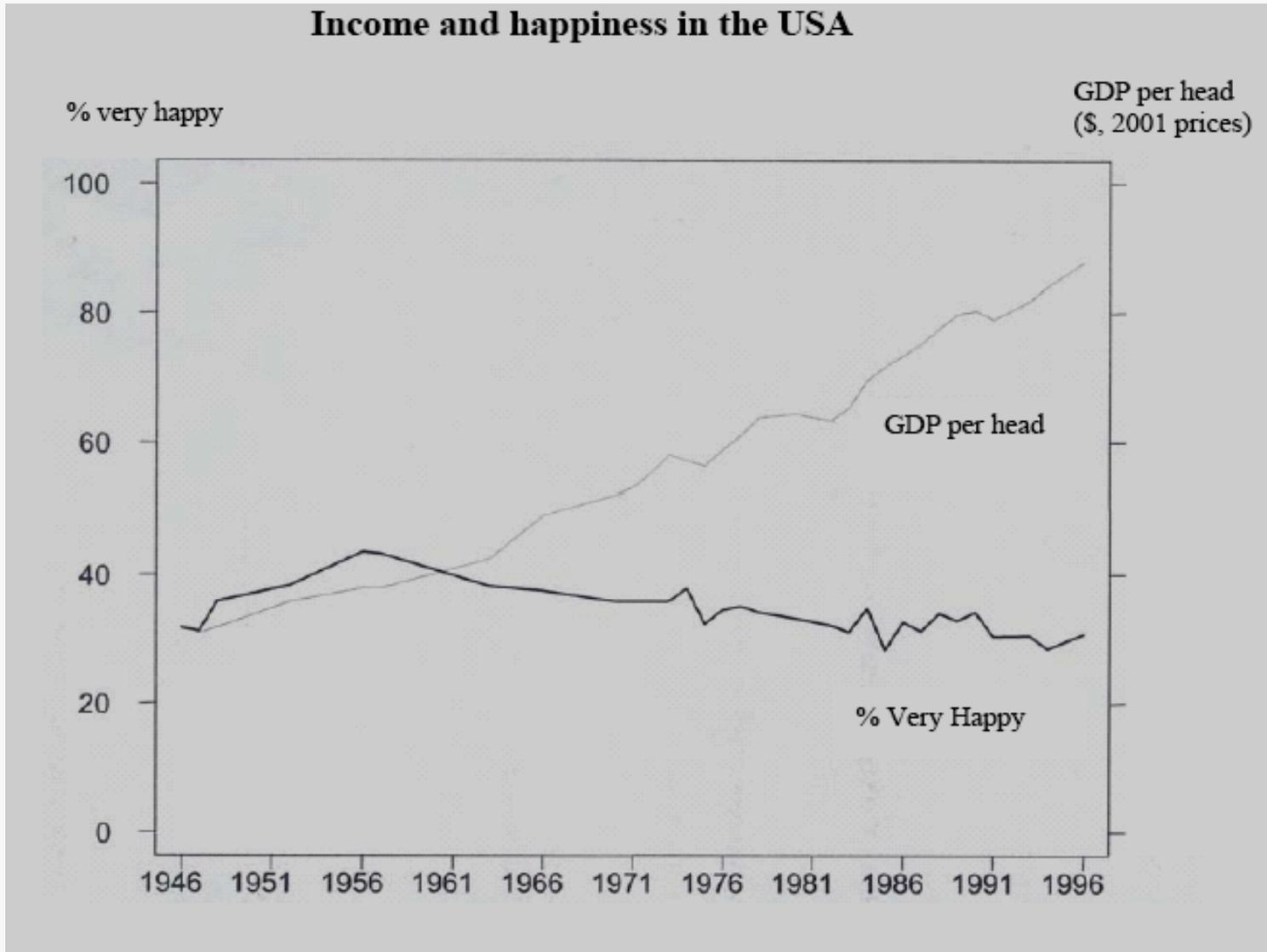
The measure: %(good mood) - %(bad mood)

Paraplegics	One month	One year
Know one	-50%	-20%
Don't know one	-41%	-37%
Lottery winners		
Know one	64%	25%
Don't know one	58%	50%

The reality of 'adaptation'

The hedonic treadmill

The Easterlin paradox

Income and happiness in the USA
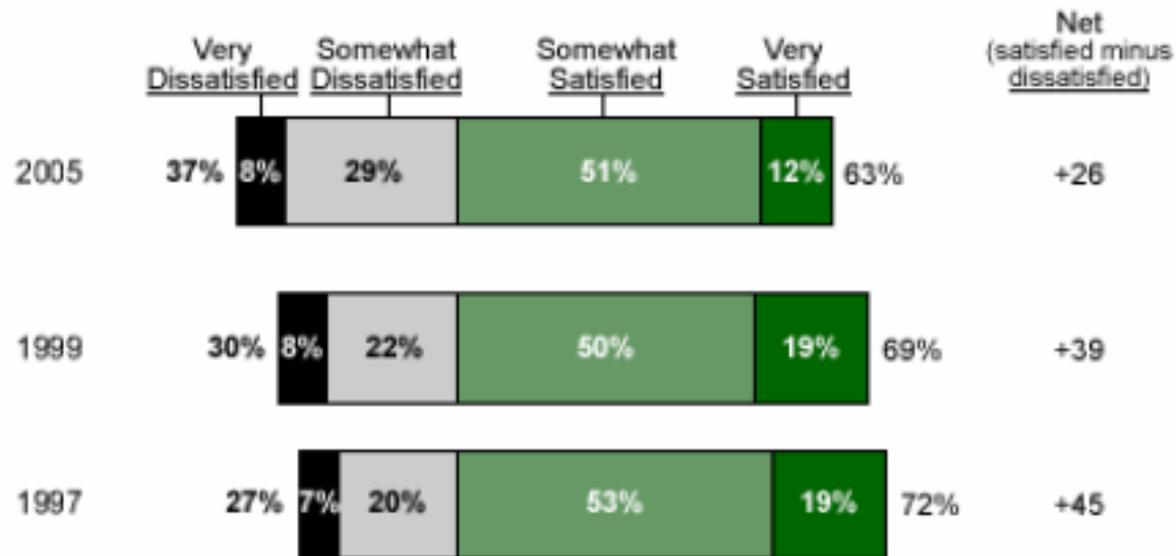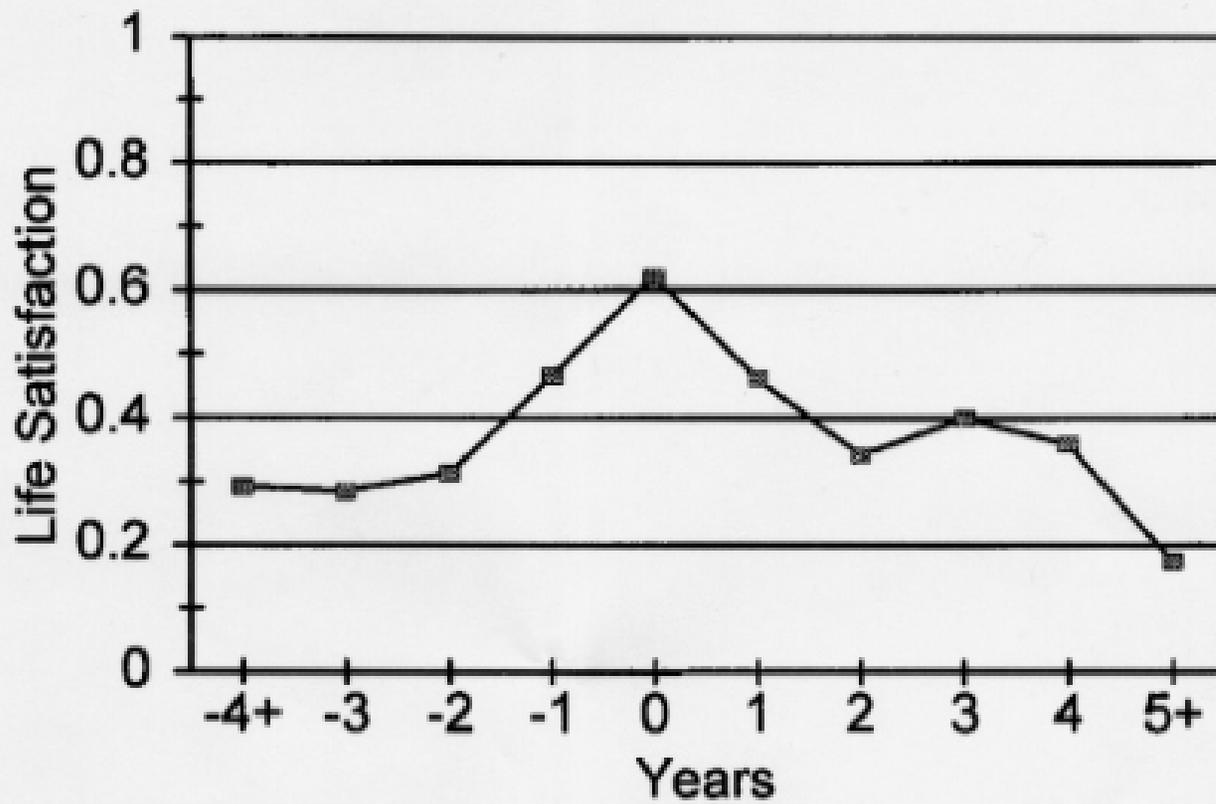
Despite a 250% increase in average real income in China from 1994 to 2005, no increase in reported life satisfaction

Overall Satisfaction With How Things Are Going in Life
(Total Sample)

Overall, how satisfied or dissatisfied are you with the way things are going in your life today? Would you say you are very satisfied, somewhat satisfied, somewhat dissatisfied, or very dissatisfied?
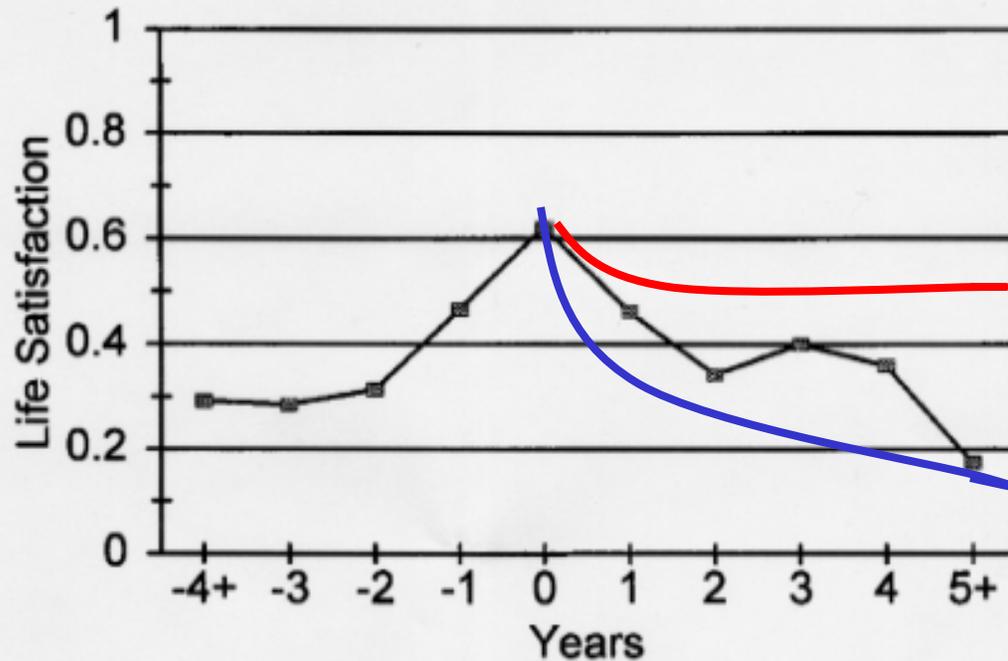
	Very Dissatisfied	Somewhat Dissatisfied	Somewhat Satisfied	Very Satisfied	Net (satisfied minus dissatisfied)
2005	37% 8%	29%	51%	12% 63%	+26
1999	30% 8%	22%	50%	19% 69%	+39
1997	27% 7%	20%	53%	19% 72%	+45

Marriage

Competing interpretations of the treadmill

Affect adapts less than life satisfaction: Our initial hypothesis

Affect adapts more than life satisfaction: our data suggest this could be true

Steps toward a Science of Well-Being

July 5, 2006

- ➢ **A ten-year project on well-being**
- ➢ **Focus on conceptual analysis and measurement**
- ➢ **Goal: a measure that**
  - ▶ can be used to compare populations, e.g., health states
  - ▶ can be used to guide and evaluate policy
- ➢ **Requirement: a measure that economists can respect**

Collaborators

➢ **Long-term team**

- ▶ **Alan Krueger**
- ▶ **David Schkade**
- ▶ **Norbert Schwarz**
- ▶ **Arthur Stone**

Collaborators

- **Long-term team**

  - **Alan Krueger**
  - **David Schkade**
  - **Norbert Schwarz**
  - **Arthur Stone**

- **Comparison of well-being in USA and France**

  - **Claude Fischler**
  - **Alan Krueger**
  - **David Schkade**
  - **Amy Krilla**

Outline

1. **A hybrid model of well-being**
2. **The Day-Reconstruction Method (DRM)**
3. **Determinants of Experienced Happiness**
4. **Happiness of women in two cities**
5. **Whose lives are better?**
   Comparing working women in the two countries
6. **Determinants of life satisfaction**
7. **The tradeoffs of a satisfying life**
8. **The second dimension**
9. **Conclusions and prospects**

1. A hybrid model of well-being:
Living, and thinking about it

Life satisfaction as an aspect of well-being

➢ **Most of what we know about well-being based on reports of satisfaction with life**

  "Considering everything, how satisfied are you with your life these days?"

➢ **The starting point of our work: doubts about the implied definition of well-being**
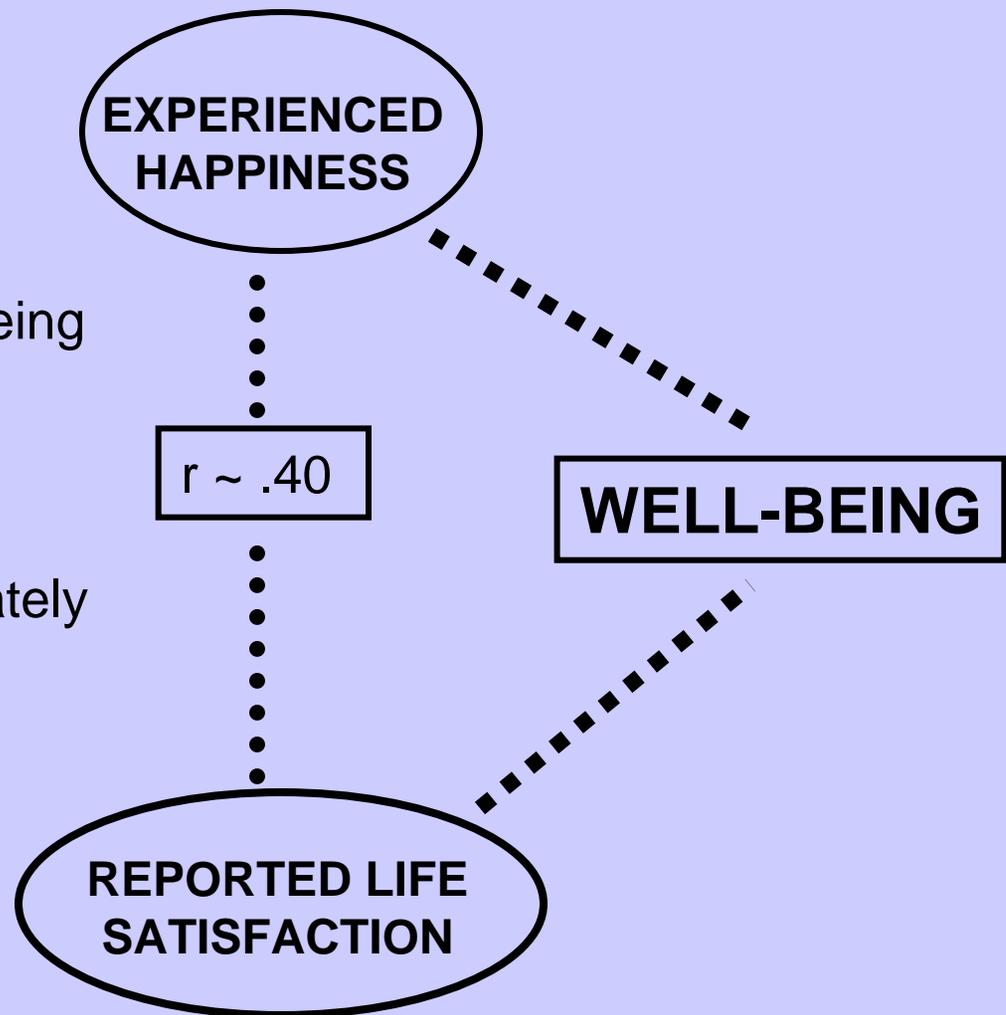
Two selves

➢ **The experiencing self**

➢ **The remembering-evaluating self**

➢ **We should not take their agreement for granted**

➢ **The duration of pleasure and pain**

  ▸ should count in assessing experiences

  ▸ but duration is often ignored in retrospective evaluations

A hybrid model of subjective well-being

A focus on time

➢ **Our definition of Experienced Happiness:**

▶ Duration-weighting of good and bad experiences

➢ **Interest in *time-use*: what do people do with their time?**

➢ **Time-use is perhaps easier to control than other determinants of well-being**

➢ **The separate measurement of experienced happiness and life satisfaction**

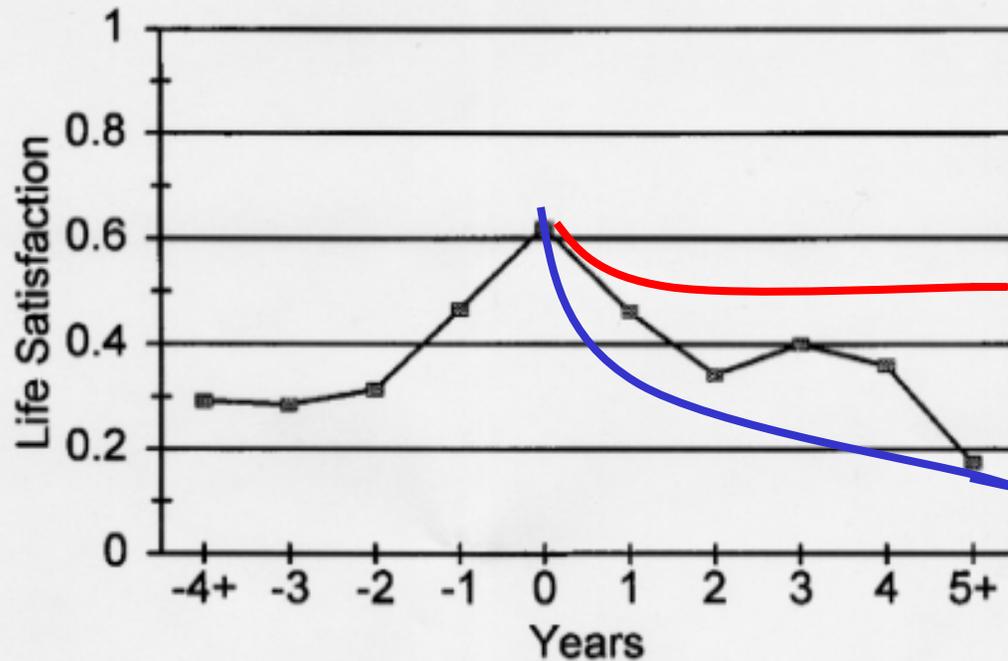 ▶ raises new questions

  ▶ may help resolve some ambiguities

The emblematic result of WB research

Marriage

From Clark, Diener and McCulloch, 2001, based on 14 waves of the German Socio-Economic Panel Study (N ~26,000)
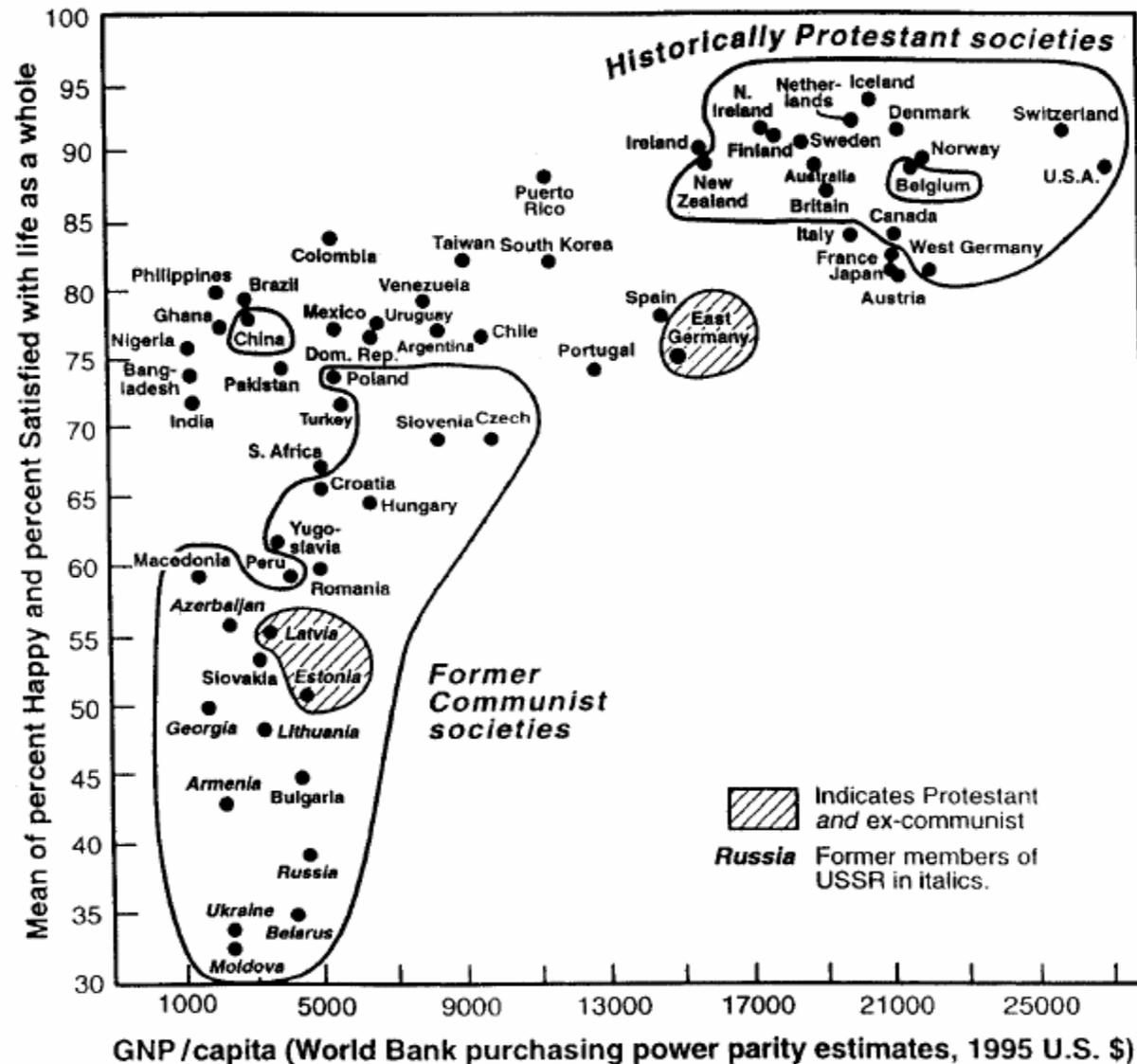
Competing interpretations

Experienced happiness adapts less than life satisfaction

Experienced happiness adapts more than life satisfaction

Interpretations of country differences

2. The Day-Reconstruction Method (DRM)

The origin and goal standard of the DRM: Experience sampling

How do you feel <u>right now</u>?

Please rate each feeling on the scale given. A rating of 0 means that you are not experiencing that feeling at all. A rating of 6 means that this feeling is a very important part of the experience.

	Not at all						Very Much
Happy	0	1	2	3	4	5	6
Tense	0	1	2	3	4	5	6

Our Procedure

➢ **Detailed reconstruction of a day**

  ▪ **Parsed into episodes (typically ~ 15 per day)**

  ▪ **Series of questions about each episode**

Were you alone?

__ no   __ yes

Were you talking with anyone? (check one)

__ no   __ one person   __ more than one

If you were talking with or interacting with anyone, was it (check all that apply):

__ spouse, significant other   __ co-workers

__ children   __ customers, students

__ parents   __ boss

__ other relatives   __ other people not listed

__ friends   (specify)_____

What were you doing? (Please read the entire list carefully and check all that apply)

__ commuting, traveling

__ working

__ shopping, errands

__ doing housework

__ preparing food

__ child care

__ talking, conversation

__ playing

__ watching television

__ listening to music

__ listening to radio

__ home computer

__ reading

__ relaxing

__ grooming, self care

__ eating

__ exercising

__ walking, taking a walk

__ making love

__ rest/sleep

__ praying

__ other not listed
(specify) _____

What were you doing? (Please read the entire list carefully and check all that apply)

__ commuting, traveling	__ talking, conversation	__ grooming, self care
__ working	__ playing	__ eating
__ shopping, errands	__ watching television	__ exercising
__ doing housework	__ listening to music	__ walking, taking a walk
__ preparing food	__ listening to radio	__ making love
__ child care	__ home computer	__ rest/sleep
	__ reading	__ praying
	__ relaxing	__ other not listed (specify) _____

If you checked several things you were doing at the same time, please <u>circle</u> the one that seemed the most important to you at the time.

What were you doing? (Please read the entire list carefully and check all that apply)

__ commuting, traveling   __ talking, conversation   __ grooming, self care

__ working   __ playing   __ eating

__ shopping, errands   __ watching television   __ exercising

__ doing housework   __ listening to music   __ walking, taking a walk

__ preparing food   __ listening to radio   __ making love

__ child care   __ home computer   __ rest/sleep

    __ reading   __ praying

    __ relaxing   __ other not listed
(specify) _____

If you checked several things you were doing at the same time, please <u>circle</u> the one that seemed the most important to you at the time.

The data I report are for **<u>focal</u>** activities

How did you <u>feel</u> during this episode?

Please rate each feeling on the scale given. A rating of 0 means that you did not experience that feeling at all. A rating of 6 means that this feeling was a very important part of the experience. Please circle the number between 0 and 6 that best describes how you felt.

	Not at all					Very much	
Impatient for it to end . . .	0	1	2	3	4	5	6
Competent / Confident . .	0	1	2	3	4	5	6
Tense / Stressed	0	1	2	3	4	5	6
Happy	0	1	2	3	4	5	6
Depressed/blue	0	1	2	3	4	5	6
Interested / focused	0	1	2	3	4	5	6
Affectionate / friendly	0	1	2	3	4	5	6
Calm / relaxed	0	1	2	3	4	5	6
Irritated / angry	0	1	2	3	4	5	6
Tired	0	1	2	3	4	5	6

Duration-weighting

➢ **All individual measures of affect are _duration-weighted_:**

▶ a score is assigned to each episode, and a duration-weighted average is computed for the whole day to characterize an individual

Our measures of Experienced Happiness

Difmax = 'Happy' - Max ('Tense', 'Depressed', 'Angry')

U-index = The proportion of time during which negative affect predominates (Difmax < 0)

Miscellaneous facts about the U-index

- ➢ **Average about 18% among American women**
  - ▶ 21% on weekdays
  - ▶ 14% on weekends
- ➢ **Very uneven distributions**
  - ▶ Top 10% of people account for almost 40% of total unpleasant-time
  - ▶ This is an underestimate of the true inequality
- ➢ **Implications for policy**
  - ▶ Focus on mental illness
  - ▶ Focus on improving use of time

# 3. Determinants of Satisfaction and of Affective Experience

Constituents of well-being

AROUSAL

AFFECTIVE EXPERIENCE

HAPPINESS
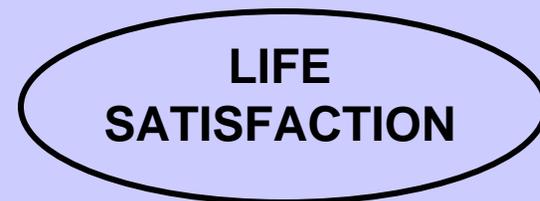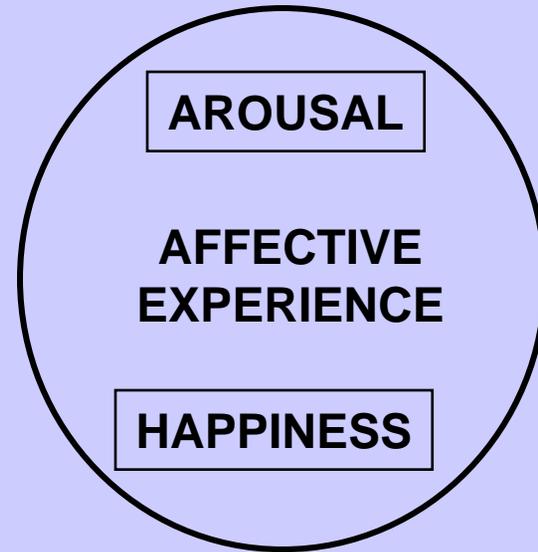
**LIFE SATISFACTION**

Determinants of Life Satisfaction

➢ **Life satisfaction is a judgment, not an experience**

➢ **It is evaluated when asked**

  ▶ susceptible to context effects (e.g., dime on the counter)

➢ **Transformed into easier questions (heuristics):**

  ▶ "How fortunate am I?"

  ▶ "How good is my mood these days?"

Heuristics of Life Satisfaction
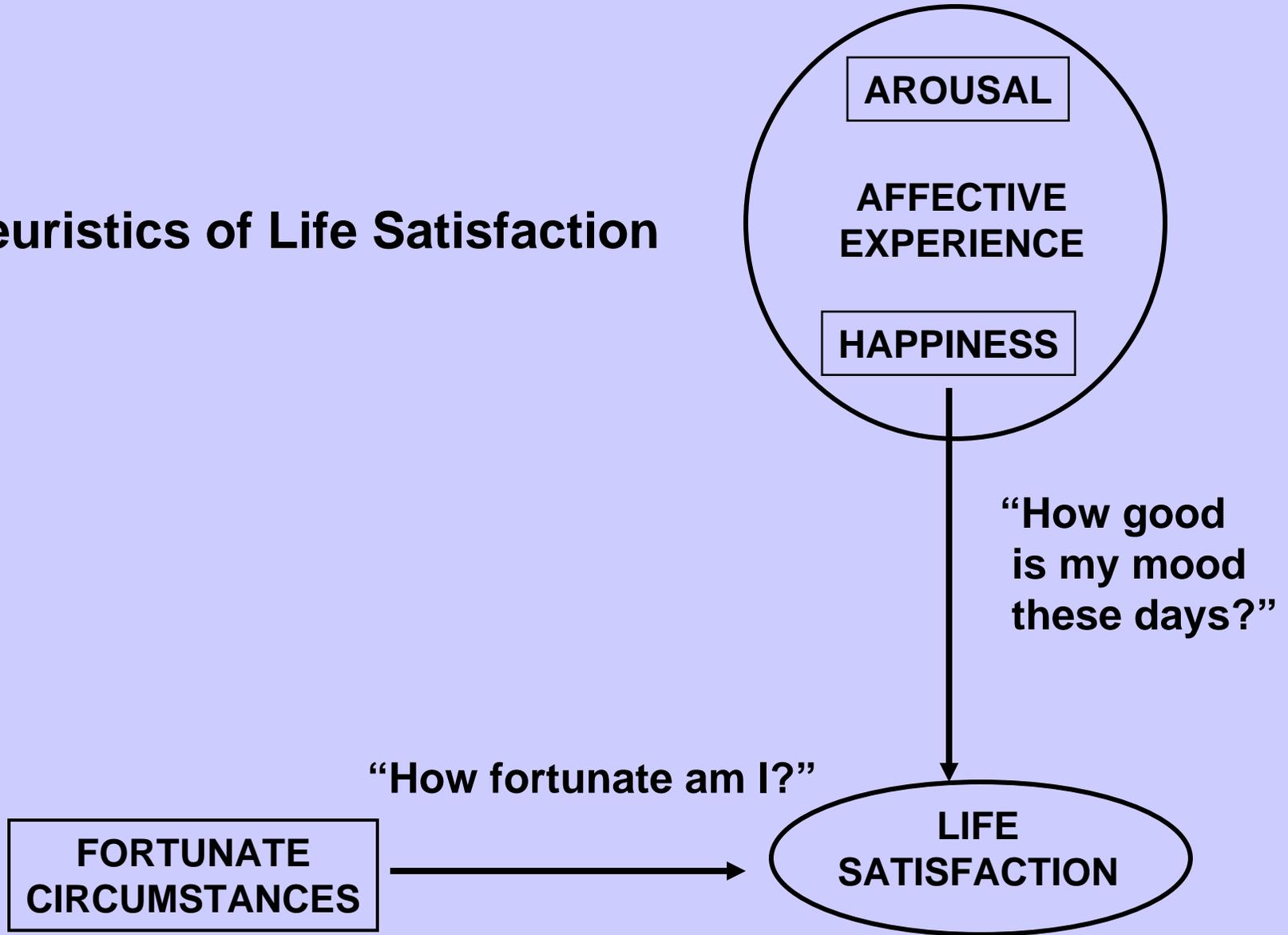
Determinants of Affective Experience

➢ **Personality**

➢ **The context of the moment**

- mood varies considerably in the course of a day

➢ **Occasional preoccupations**

- recent events, passionate love, bereavement
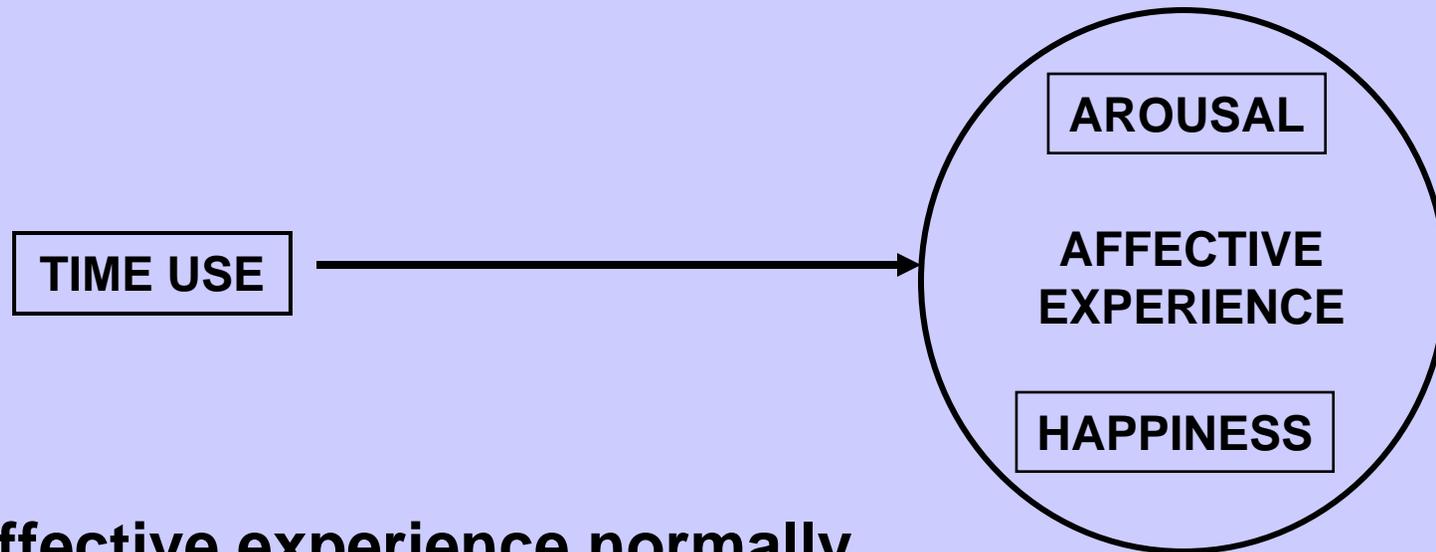
TIME USE → **AFFECTIVE EXPERIENCE** (AROUSAL, HAPPINESS)

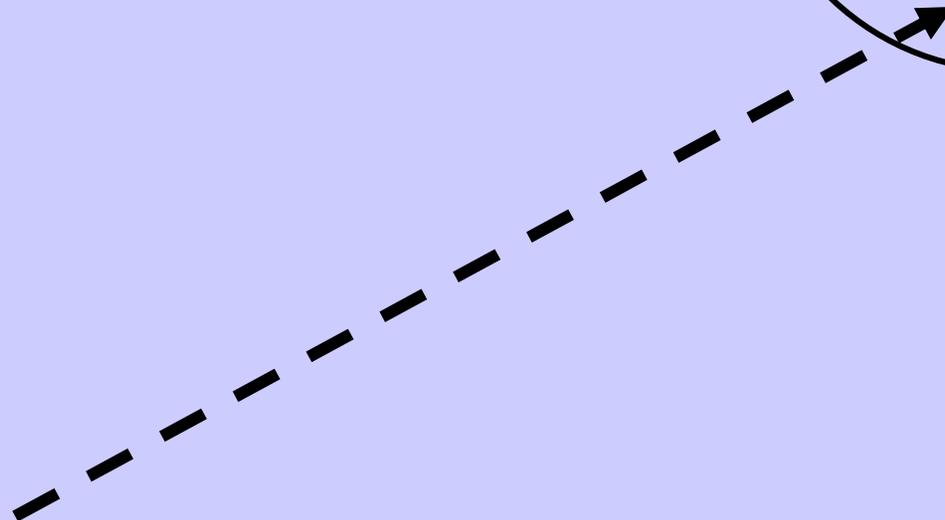**Affective experience normally depends (in addition to personality) on the circumstances of the moment**
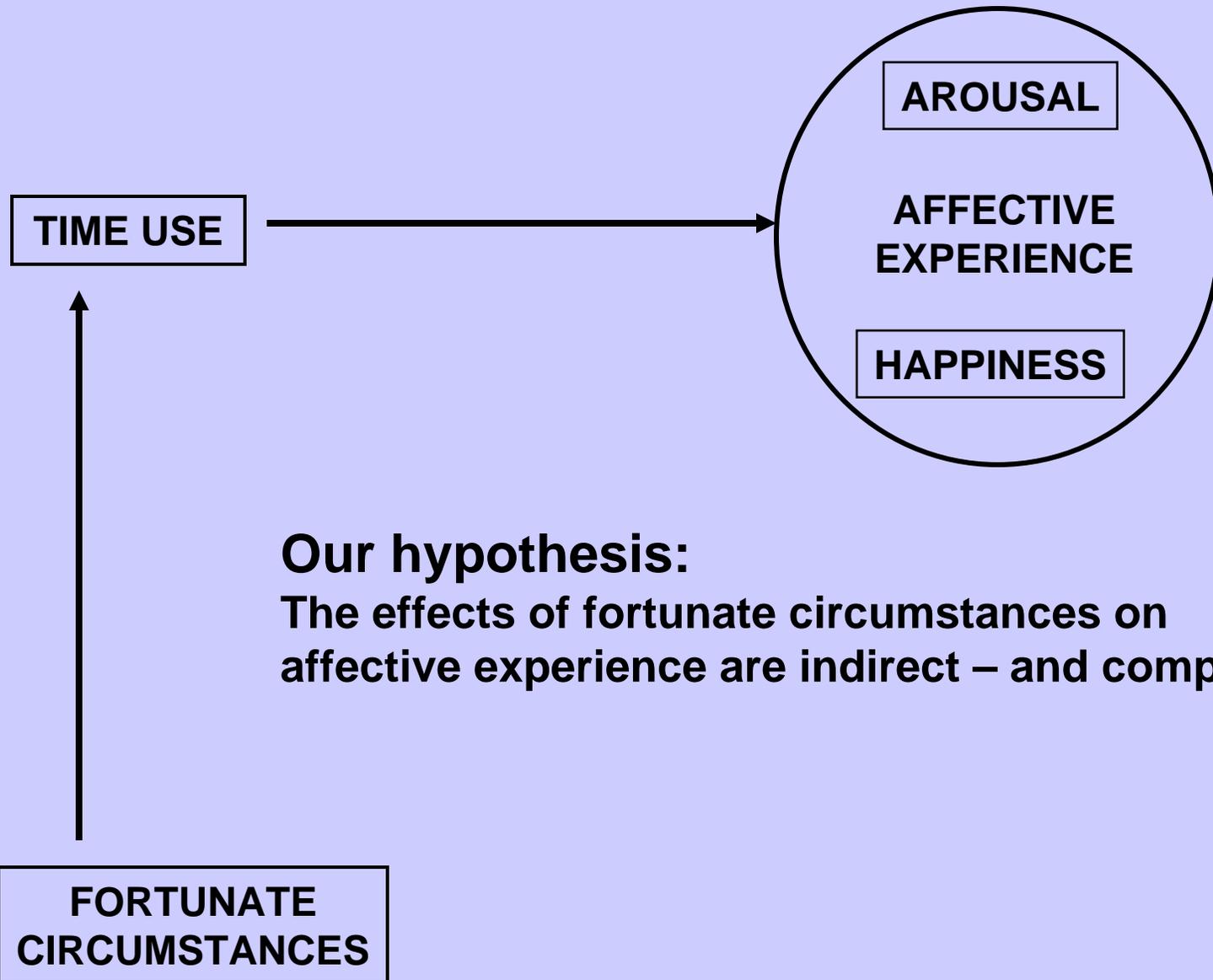
The frequently asked questions:
"are the rich happier than the poor?"
"are the married happier than the single?"

AROUSAL

AFFECTIVE
EXPERIENCE

HAPPINESS

FORTUNATE
CIRCUMSTANCES

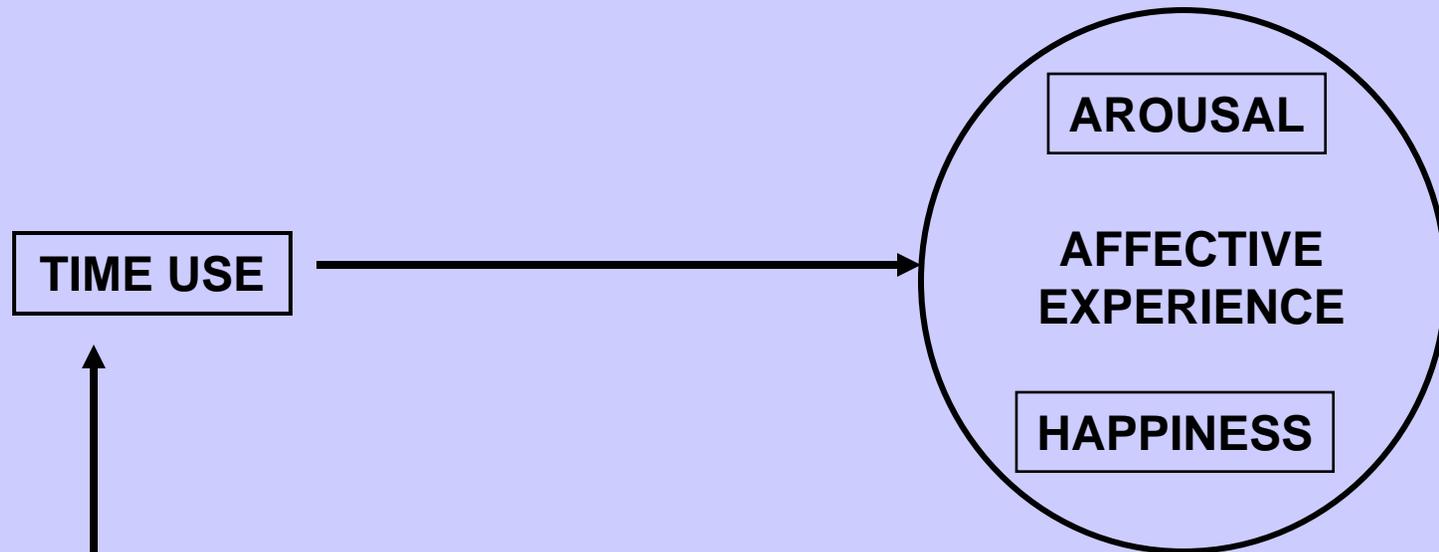** AROUSAL **

**AFFECTIVE
EXPERIENCE**

HAPPINESS

TIME USE
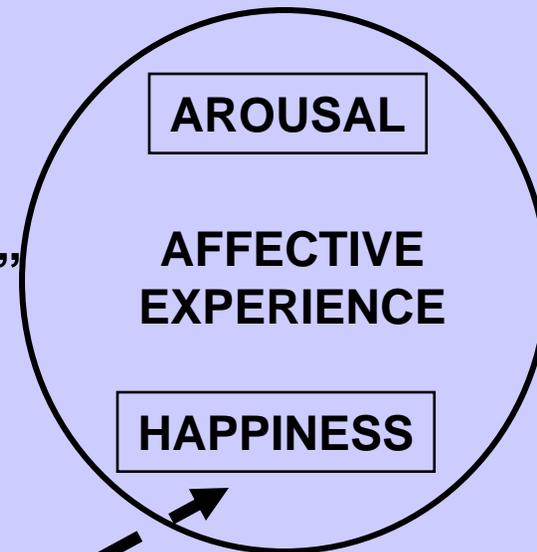
**FORTUNATE
CIRCUMSTANCES**

Our hypothesis:
**The effects of fortunate circumstances on
affective experience are indirect – and complex**
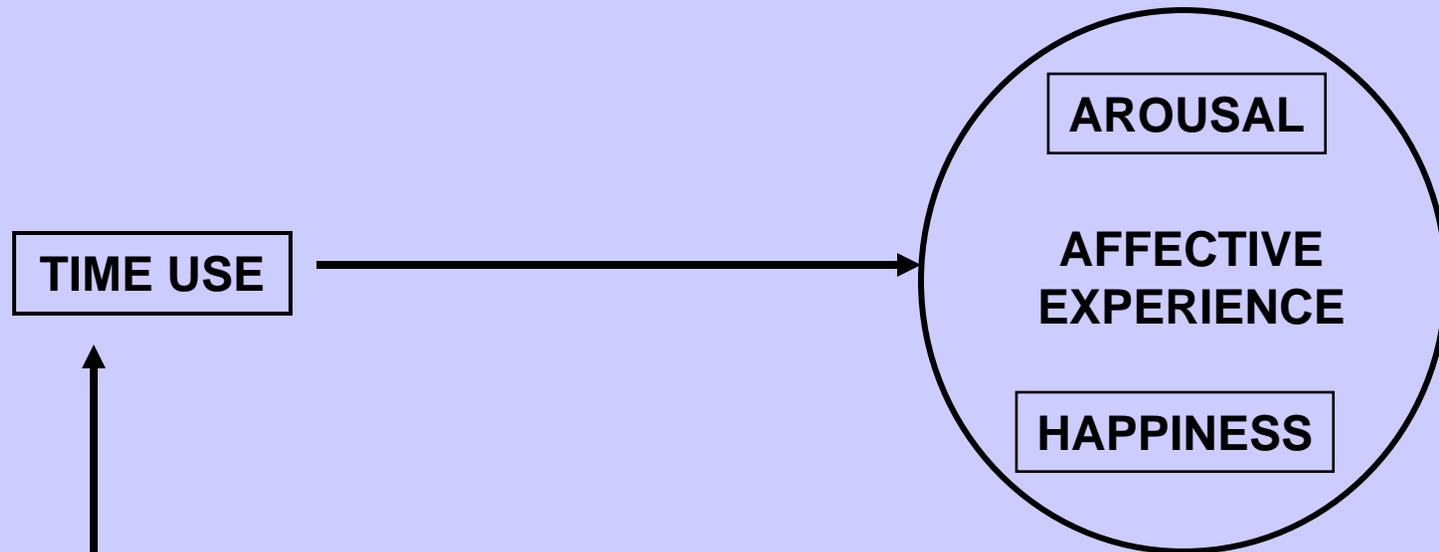
The model we study:

TIME USE → **AFFECTIVE EXPERIENCE** (AROUSAL, HAPPINESS)

FORTUNATE CIRCUMSTANCES → **LIFE SATISFACTION**
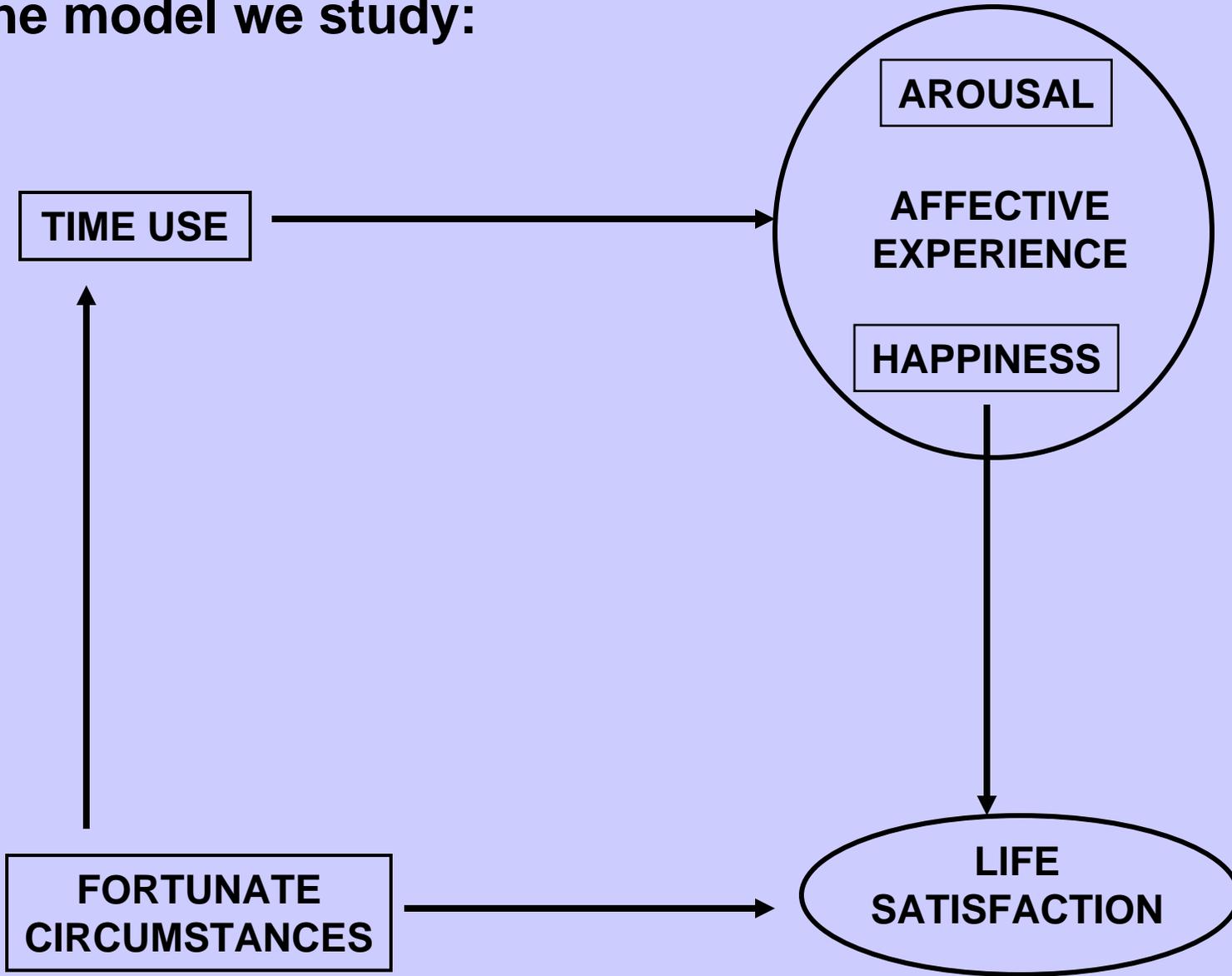
What are the proper weights?

- **When satisfaction and experienced happiness diverge or conflict --- which should count?**
  - This is a philosophical question
- **There is also an empirical question:**
  - *which of them influences health?*
  - Sheldon Cohen's results suggest that positive affect is critical

4. Happiness of women in two cities

The team:

Daniel Kahneman

Claude Fischler

David Schkade,

Alan Krueger

Amy Krilla

The data I will talk about

➢ **Fairly detailed knowledge of what happened in one day of the lives of many women, aged 18-60.**
➢ **Sample size** (after excluding students aged < 30)
  ▶ 770 in Columbus, Ohio
  ▶ 701 in Rennes, France
➢ **Participants recruited by random-digit dialing**
➢ **Their demographics resemble those of US and France**
➢ **But the sample is <u>not</u> a probability sample, generalize at your peril**

➢ **We used the Day-Reconstruction Method (DRM) to measure affective experience**
➢ **300 women in each country described a weekend day**

5. Determinants of Experienced Happiness

Personality

Corr with Difmax

-.41 **-.43**   **Low Energy, vitality**

During the past month, how much of a problem has it been for you to keep up enough enthusiasm to get things done?

.29   **.22**   **Sleep quality**

During the past month, how would you rate your overall sleep quality?

        "How others see you"

Enthusiastic

Optimistic

Laughs easily

    .28   **Sees the bright side**

Comfortable everywhere

Enjoys good food

Enjoys being with people

Pessimistic

Often worries for nothing

-.37 **-.29**   **A bit depressed**

-.35   **Often angry**

-.38 **-.32**   **Tense and uncomfortable**
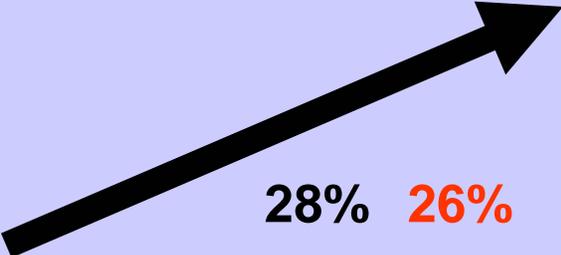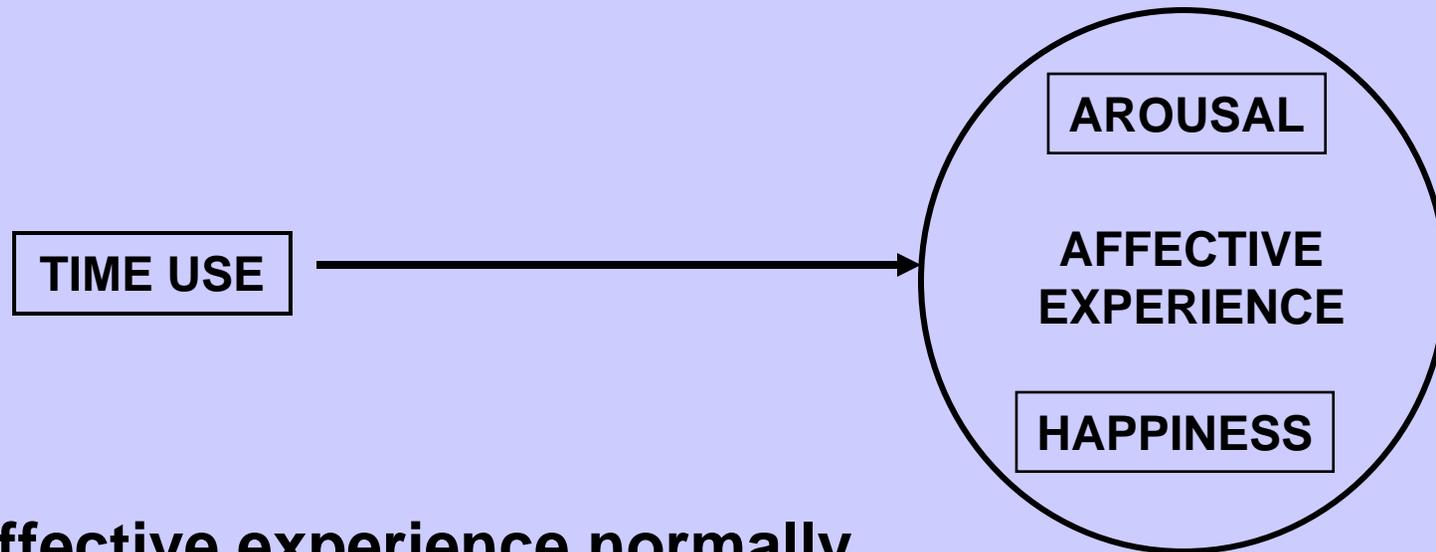
TIME USE → **AFFECTIVE EXPERIENCE** (AROUSAL, HAPPINESS)

Affective experience normally depends (in addition to personality) on the circumstances of the moment

Categories of activities

➢ **Engaged leisure:**

▶ making love, playing, reading, walking, praying

➢ **Eating**

➢ **Talking**

➢ **Passive leisure:**

▶ TV, relaxing, sleeping

➢ **Home Compulsory**

▶ housework, child care, shopping, preparing food

➢ **Work and Commute**

Time-Use (% of waking day)

	COLUMBUS	RENNES
Engaged Leisure	11.5	12.5
Eating	5.2	11.7
Talking	9.6	10.8
Passive Leisure	13.1	12.3
Home Compulsory	29.8	27.3
Work and Commute	22.2	19.3
SOCIAL	76.1	71.9
ALONE	23.9	28.1

➢ **We compute averages of Difmax or U-index for activities and interactions**

➢ **In this calculation all individuals who contribute data for an activity are weighted alike**

DIFMAX

COLUMBUS	RENNES
making love	making love
play	play
x	x
x	x
x	x
x	x
x	x
x	x
x	x
x	x
x	child care
x	x
	x
	x
x	
housework	x
x	x
child care	shop
shop	housework
commute	work
work	commute

r = .90

Activity Categories – U-index

	COLUMBUS	RENNES
Engaged Leisure	11.0	9.6
Eating	11.4	9.5
Talking	14.9	12.2
Passive Leisure	10.9	11.2
Home Compulsory	19.4	17.2
Work and Commute	27.8	24.0
SOCIAL	13.5	9.5
ALONE	17.9	18.1
SOCIAL ADVANTAGE	4.4	8.6

Activity Categories – U-index

	COLUMBUS	RENNES
Engaged Leisure	11.0	9.6
Eating	11.4	9.5
Talking	14.9	12.2
Passive Leisure	10.9	11.2
Home Compulsory	19.4	17.2
Work and Commute	27.8	24.0
SOCIAL	13.5	9.5
ALONE	17.9	18.1
SOCIAL ADVANTAGE	4.4	8.6

And a pet may be almost as good as a friend!

Why we are happier on weekends
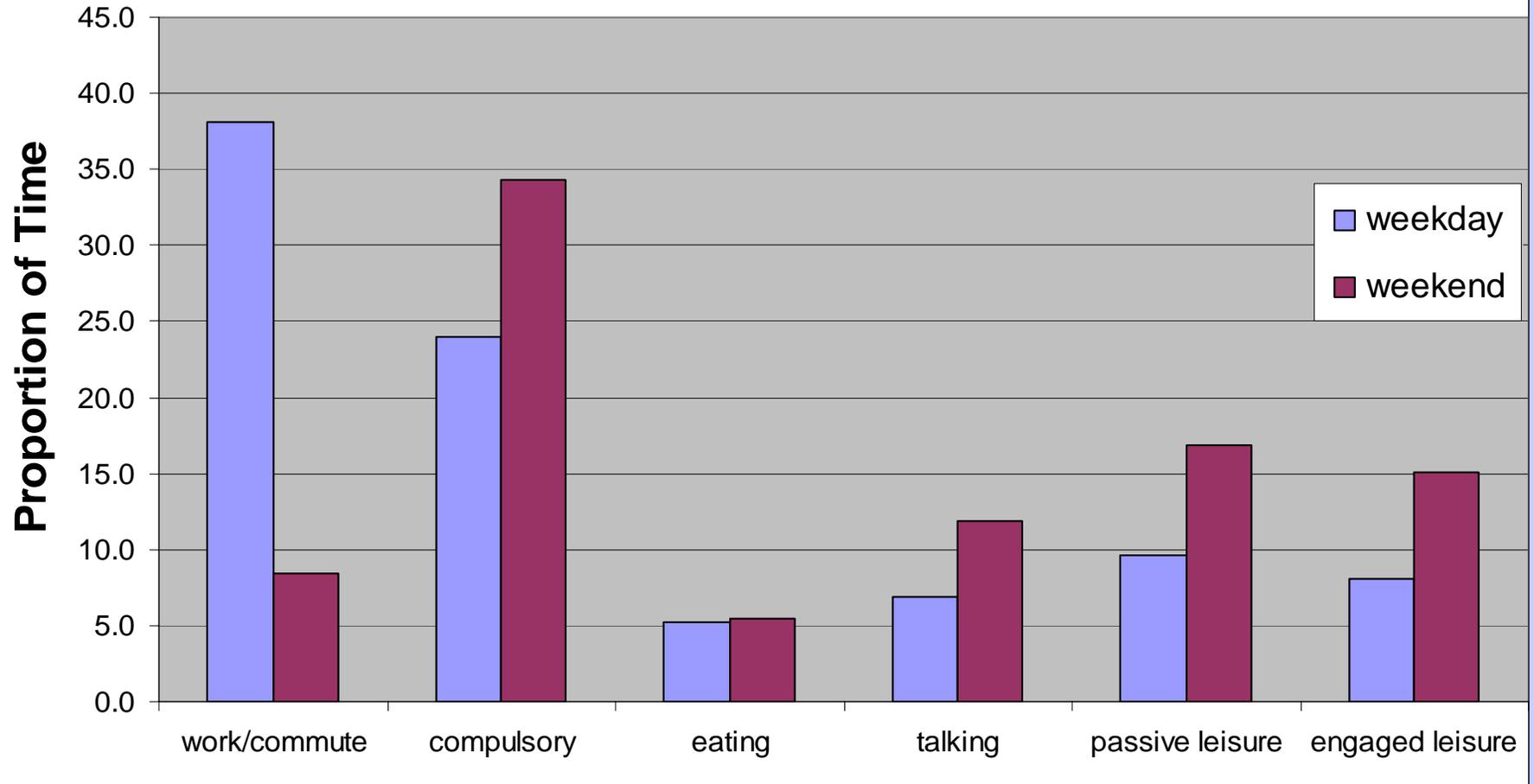
U-index for Columbus working women is 21% on weekdays and 14% on weekends
Corresponding values in Rennes sample: 18% and 13.5%

5. Whose lives are better?

Comparing working women in the two countries

Working women in Rennes have (slightly better) lives

Proportion of T

Legend: American, French

Categories: work/commute, compulsory, eating, talking, passive leisure, engaged leisure
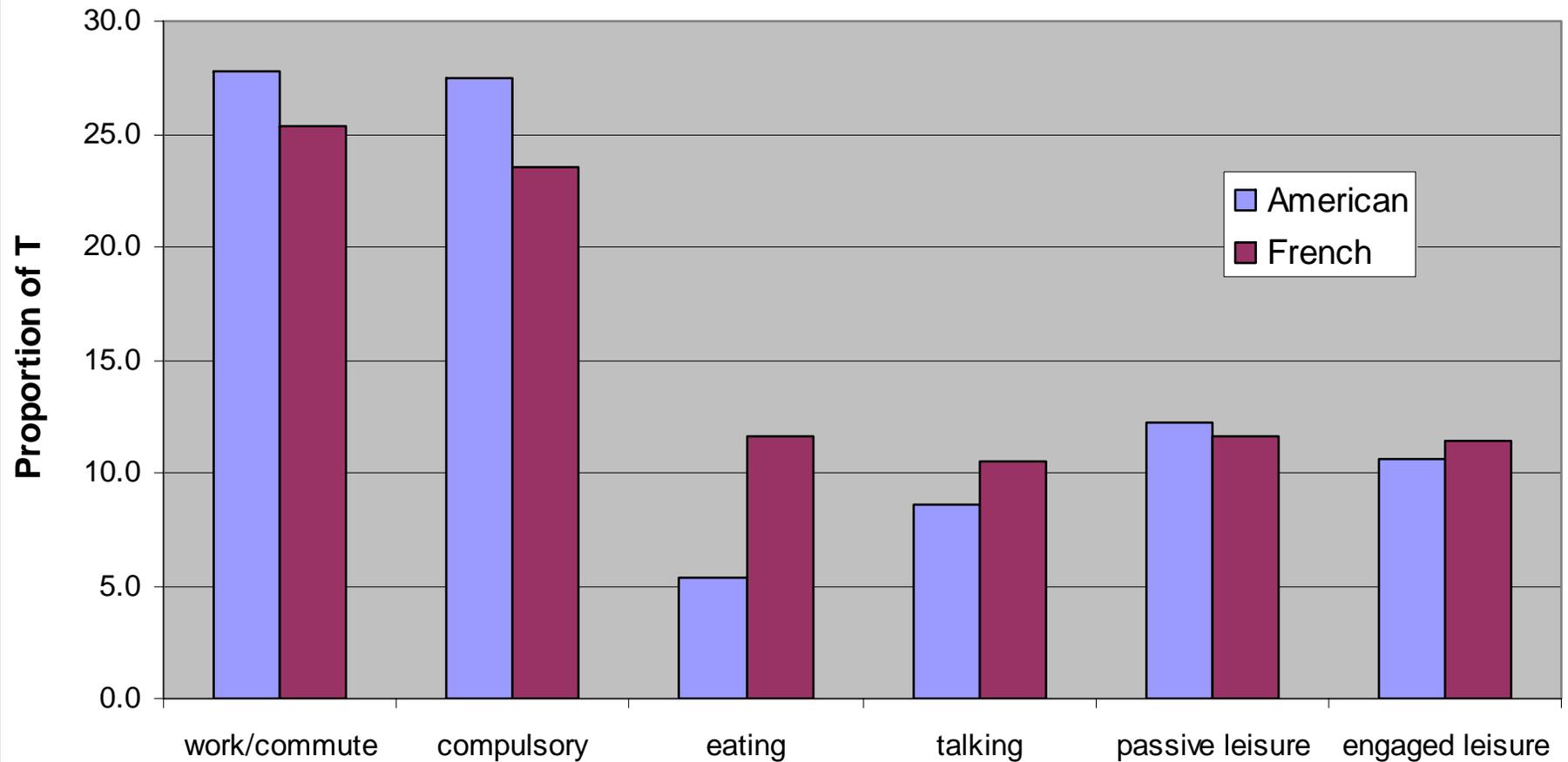
U-index US-tastes   Columbus: 17.9% Rennes: 16.7%   t = 5.29

U-index FR-tastes   Columbus: 16.2% Rennes: 15.1%   t = 4.73

- In a normal week, the French advantage exists only on weekdays
- The overall French advantage is increased significantly (but not dramatically) by incorporating vacation days

6. Determinants of Life Satisfaction

Life Satisfaction: Diener-Emmons Scale

Agreement with five statements (7-point scale)

"In most ways, my life is close to ideal."

"The conditions of my life are excellent."…

Determinants of Satisfaction and Happiness
Columbus

	L.SAT	E.HAP
Household Income	.36**	
Has mate	.27**	
Education	.23**	
Lives with child <6	.11**	
Age	.02	
Non-white	-.22**	
Unemployed	-.13**	
Body-Mass Index	-.13**	
Health problem	-.09*	

Determinants of Satisfaction and Happiness
Columbus

	L.SAT		E.HAP

Household Income	.36**	>	.10**
Has mate	.27**	>	.04
Education	.23**	>	.00
Lives with child <6	.11**	>	-.03
Age	.02	<	.08*
Non-white	-.22**	>	-.09*
Unemployed	-.13**	>	-.04
Body-Mass Index	-.13**	>	.03
Health problem	-.09*	>	-.04

Determinants of Satisfaction and Happiness

Rennes

	SAT	HAP
Has mate	.38**	
Household Income	.35**	
Lives with child <6	.23**	
Education	.22**	
Unemployed	-.18**	
Health problem	-.10**	
Body-Mass Index	-.10*	
Age	-.08*	
Body-Mass Index	-.10*	

Determinants of Satisfaction and Happiness

Rennes

	SAT		HAP
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Has mate	.38**	>	.12
Household Income	.35**	>	.08*
Lives with child <6	.23**	>	.09*
Education	.22**	>	-.06
Unemployed	-.18**	>	-.07
Health problem	-.10**	>	-.01
Body-Mass Index	-.10*	>	.01
Age	-.08*	>	-.05
Body-Mass Index	-.10*	>	.01

The Good-Fortune Index (GFI) in Two Cities:
Beta weights for life satisfaction

	Columbus	Rennes
Household Income	.24**	.15**
Has mate	.08*	.25**
Education	.11**	.12**
White (US)	.09*	
Unemployed		.19
Lives with child <6	.12**	.12**
Health problem	.08*	
Age		-.08*

- In both samples, satisfying circumstances account for more than 20% of the variance of life satisfaction
- The same variables account for 1%-2% of the variance of Experienced Happiness

7. Costs and benefits of a satisfying life

Benefits and Costs – Having a mate (US)

% time   **no mate**   **has mate**

Benefits and Costs – Having a mate (US)

% time	no mate	has mate
alone	28%	15%

Benefits and Costs – Having a mate (US)

% time	no mate	has mate
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immediate, nuclear family	17%	38%

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intimates (friends, family)	16%	3%

Benefits and Costs – Having a mate (US)

% time	no mate	has mate
alone	28%	15%
immediate, nuclear family	17%	38%
intimates (friends, family)	16%	3%
compulsory home tasks	23%	31%

Benefits and Costs – Having a mate (US)

| % time	no mate	has mate
alone	28%	15%
immediate, nuclear family	17%	38%
intimates (friends, family)	16%	3%
compulsory home tasks	23%	31%
discretionary activities	41%	35%

Benefits and Costs – Having a mate (US)

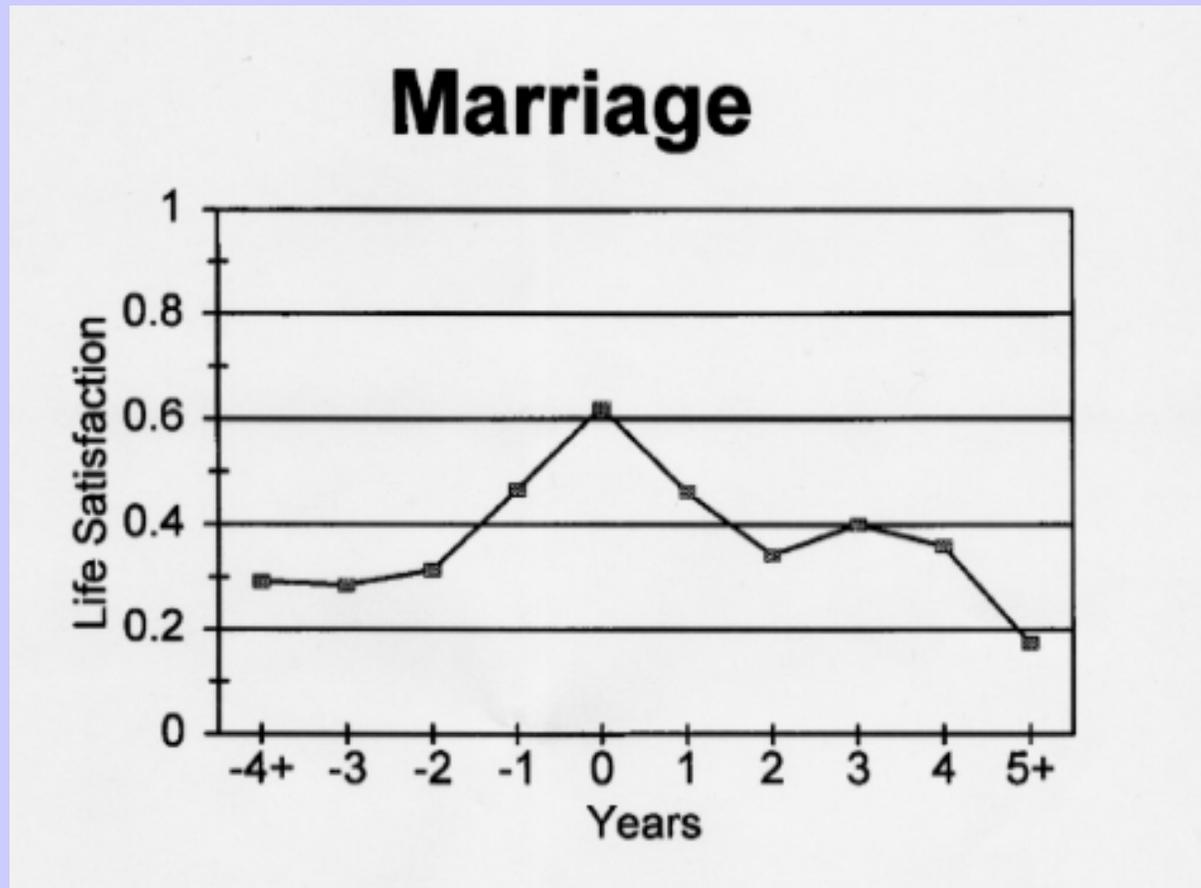| % time	no mate	has mate
alone	28%	15%
immediate, nuclear family	17%	38%
intimates (friends, family)	16%	3%
compulsory home tasks	23%	31%
discretionary activities	41%	35%

Back to marriage: is this a mystery?
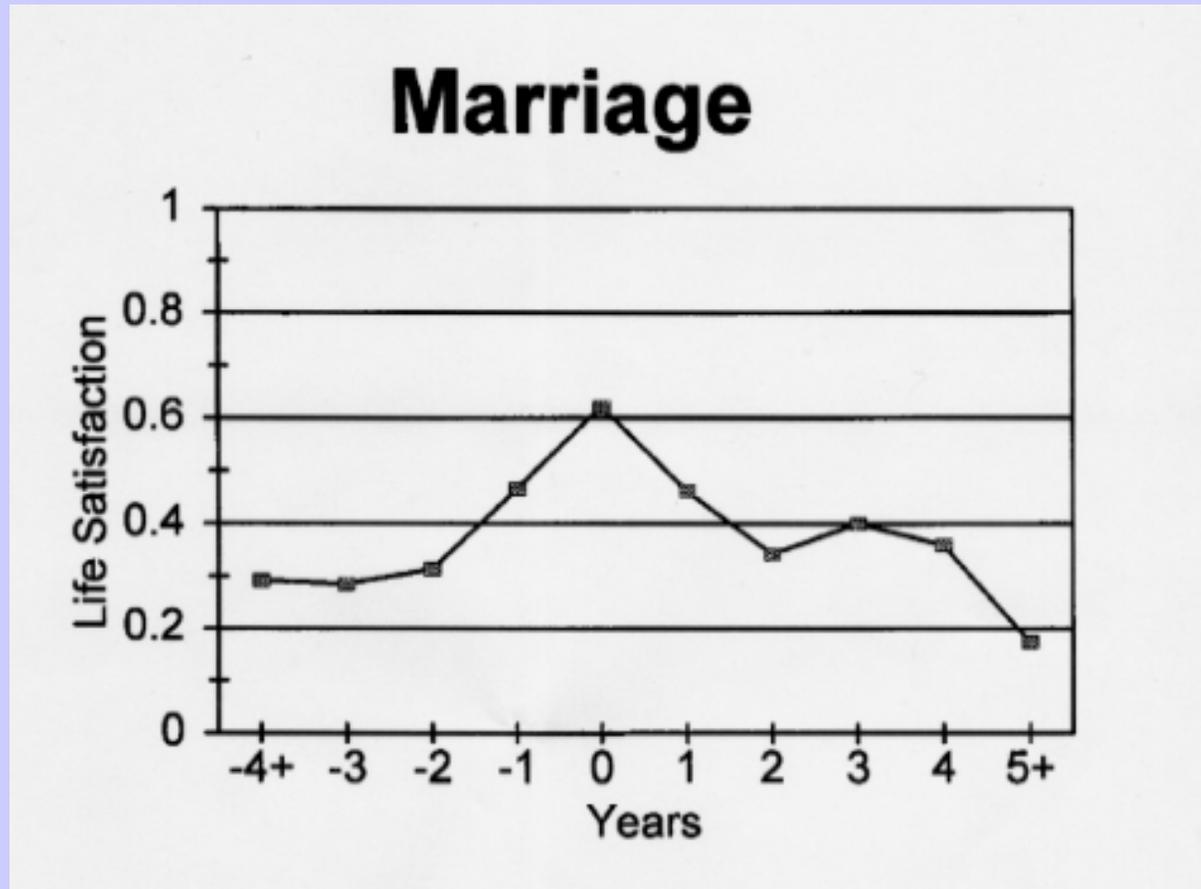
Back to marriage: is this a mystery?

Time use data focus our attention on the steady state of marriage

Back to marriage: is this a mystery?

Time use data focus our attention on the steady state of marriage

In the steady state, there may be no mystery

Time-use correlates of Good Fortune
Difference between top and bottom thirds (minutes)

	COLUMBUS	RENNES
Engaged Leisure	1	-4
Eating	13	8
Talking	-9	10
Passive Leisure	-57	-38
Home Compulsory	86	19
Work and Commute	8	35
SOCIAL	105	166

8. Conclusions and prospects

The joy of a new hammer: many nails

- ➢ **New tools may provide new perspectives**
- ➢ **The new tools proposed here:**
    - ▶ bottom-up measurement of experienced happiness
    - ▶ detailed study of time-use
- ➢ **Advancing the goal of National Well-Being Accounts:**
    - ▶ Alan Krueger and the modified ATUS
- ➢ **Advancing the goals of measuring the burden of illness and the burden of ageing**

Improving well-being

➢ **Can experienced happiness and life satisfaction be jointly improved?**

➢ **Time-use may be the determinant of well-being that is the most susceptible to improvement**

▸ by the individual

▸ in the context of policy

The end