

engineering happiness

a new
approach
for building
a joyful life



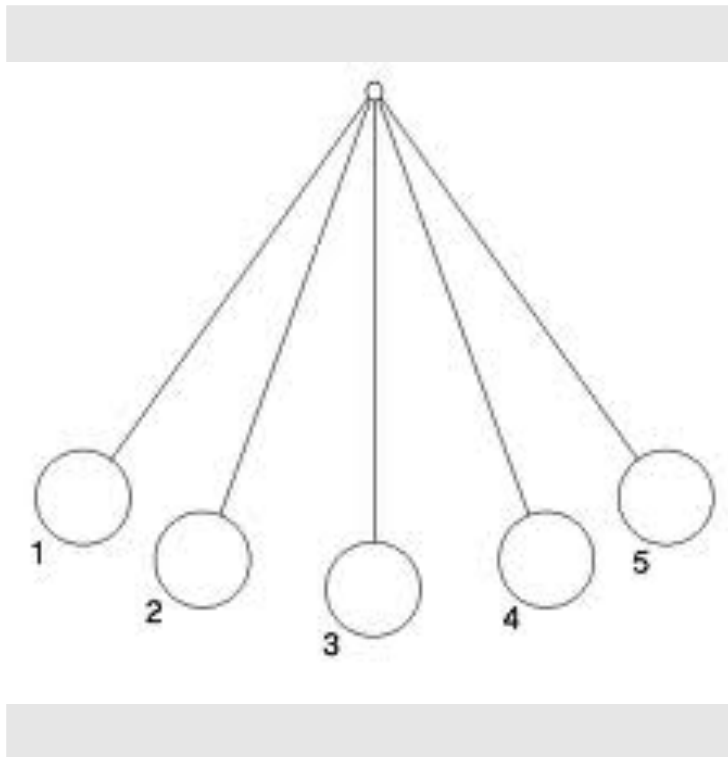
MANEL BAUCCELLS AND RAKESH SARIN

A Quote

We are what our deep, driving desire is. As our deep, driving desire is, so is our will. As our will is, so is our deed. As our deed is, so is our destiny.

— *Upanishad*



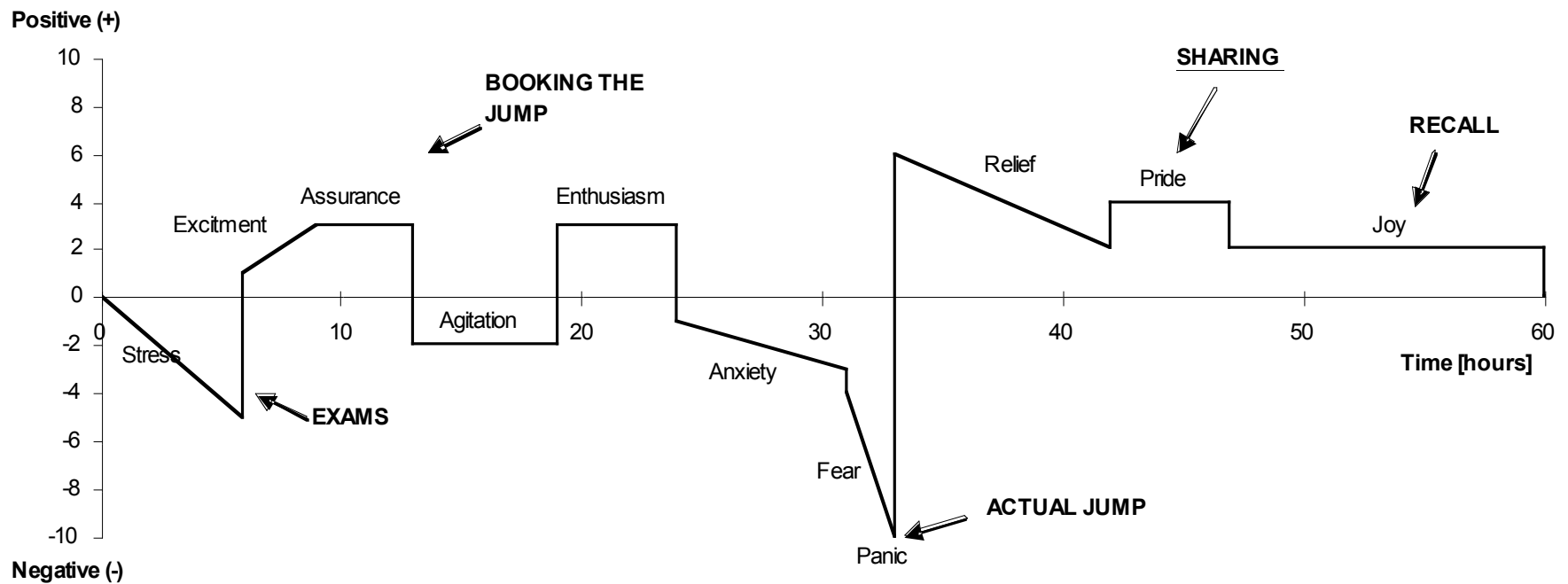


What is Happiness?

- Sum Total of Moment Happiness
(happydons)



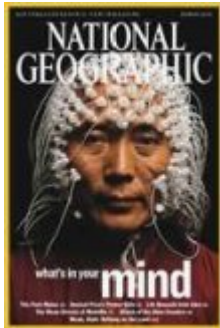
Happiness Seismogram of the Skydiving Experience



Measuring Happiness

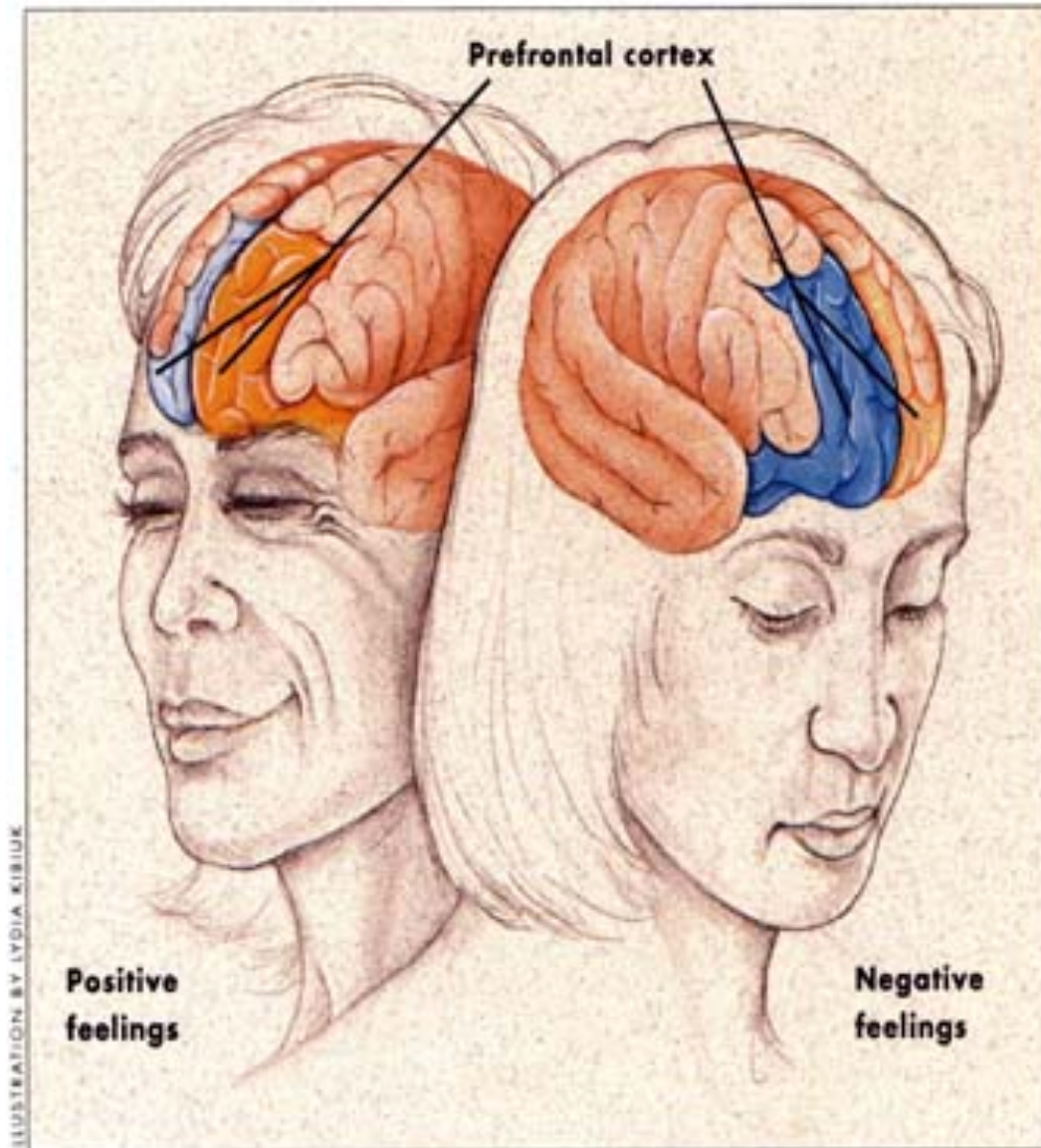
- Self Reports
- Experience Sampling
- Bodily Measurements
- Neuro-Imaging



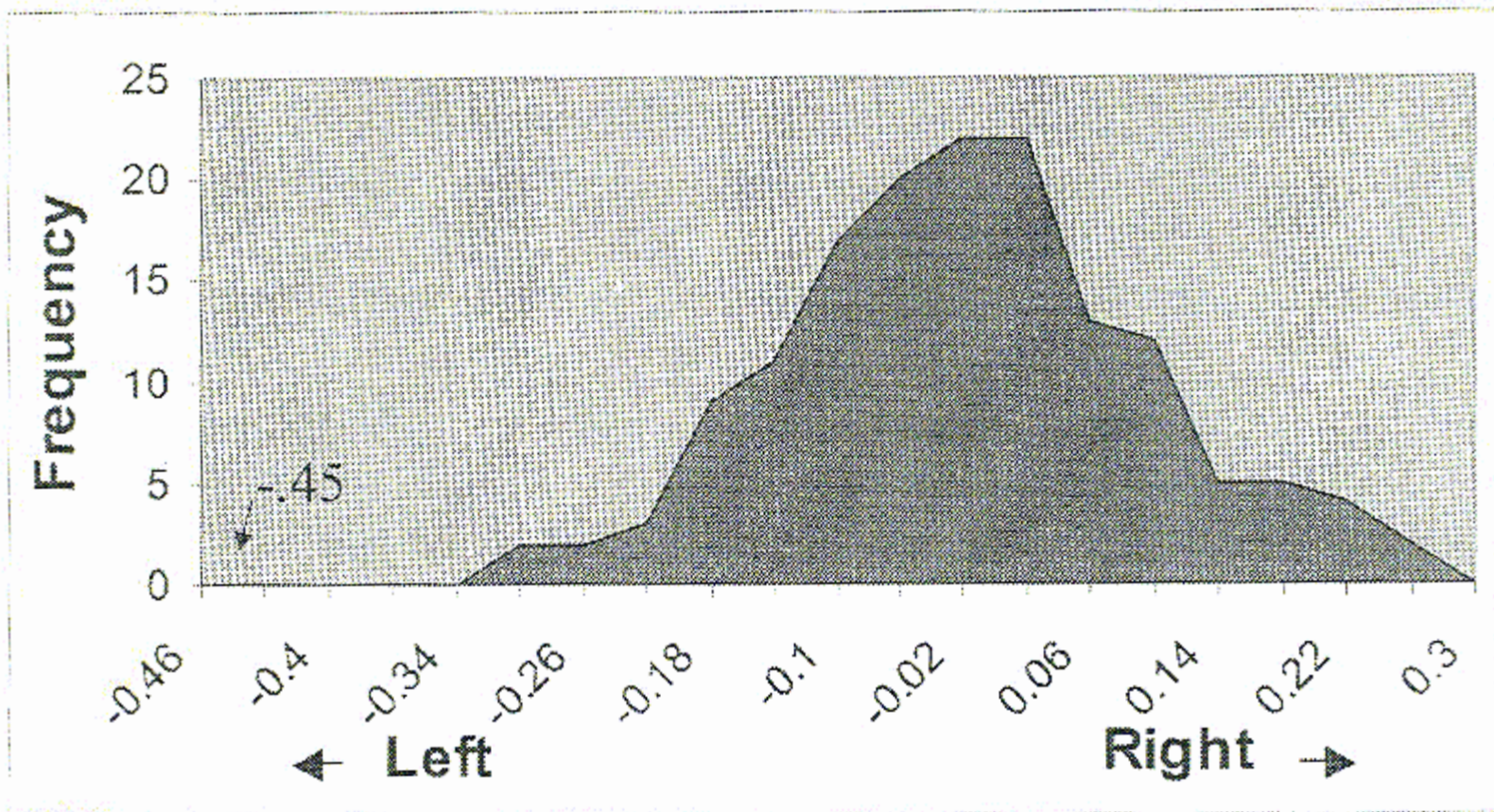


the
mind
is what
the brain
does





Physiological effects of a spiritual skill
Left prefrontal activation (gamma power)
(R.J. Davidson)



Mathieu Ricard



Figure 1. Country Comparison of Income and Happiness

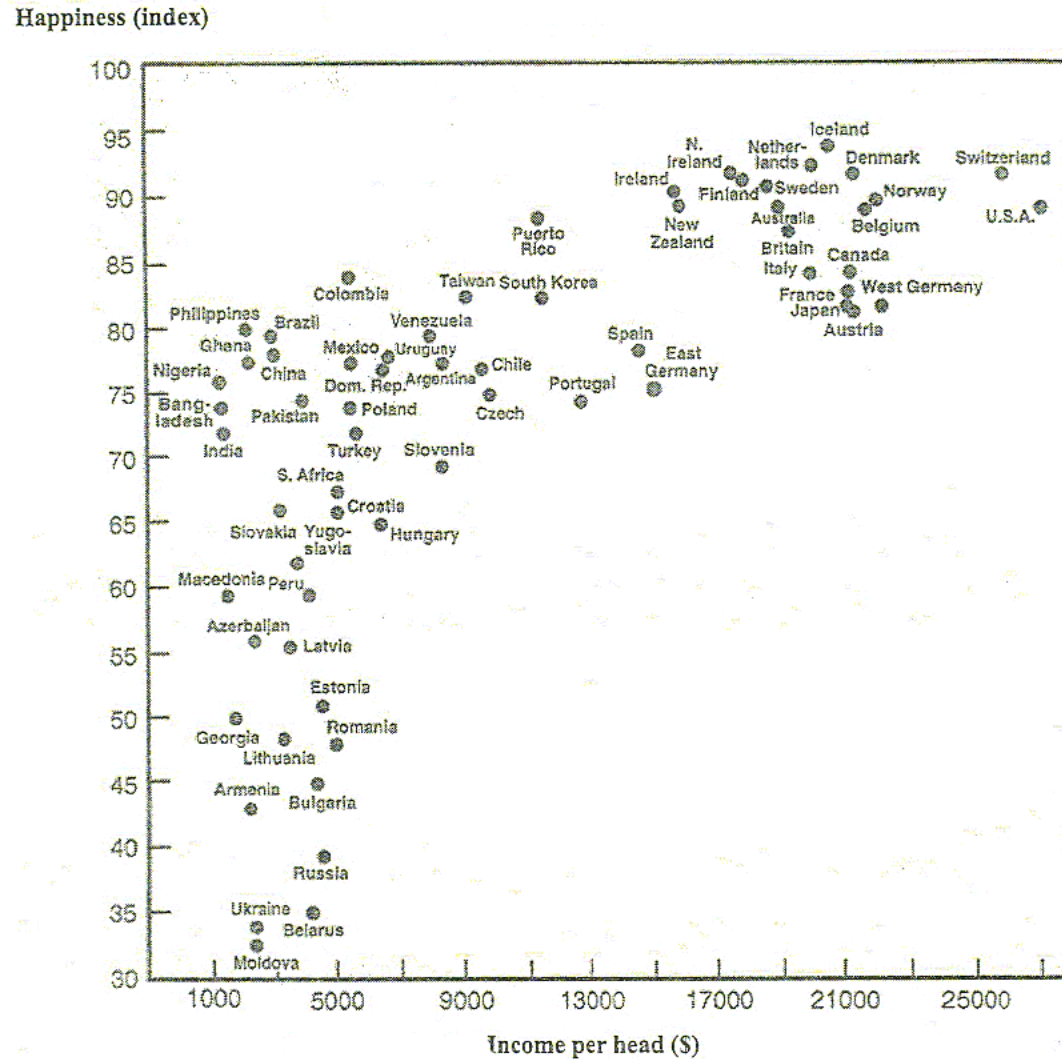
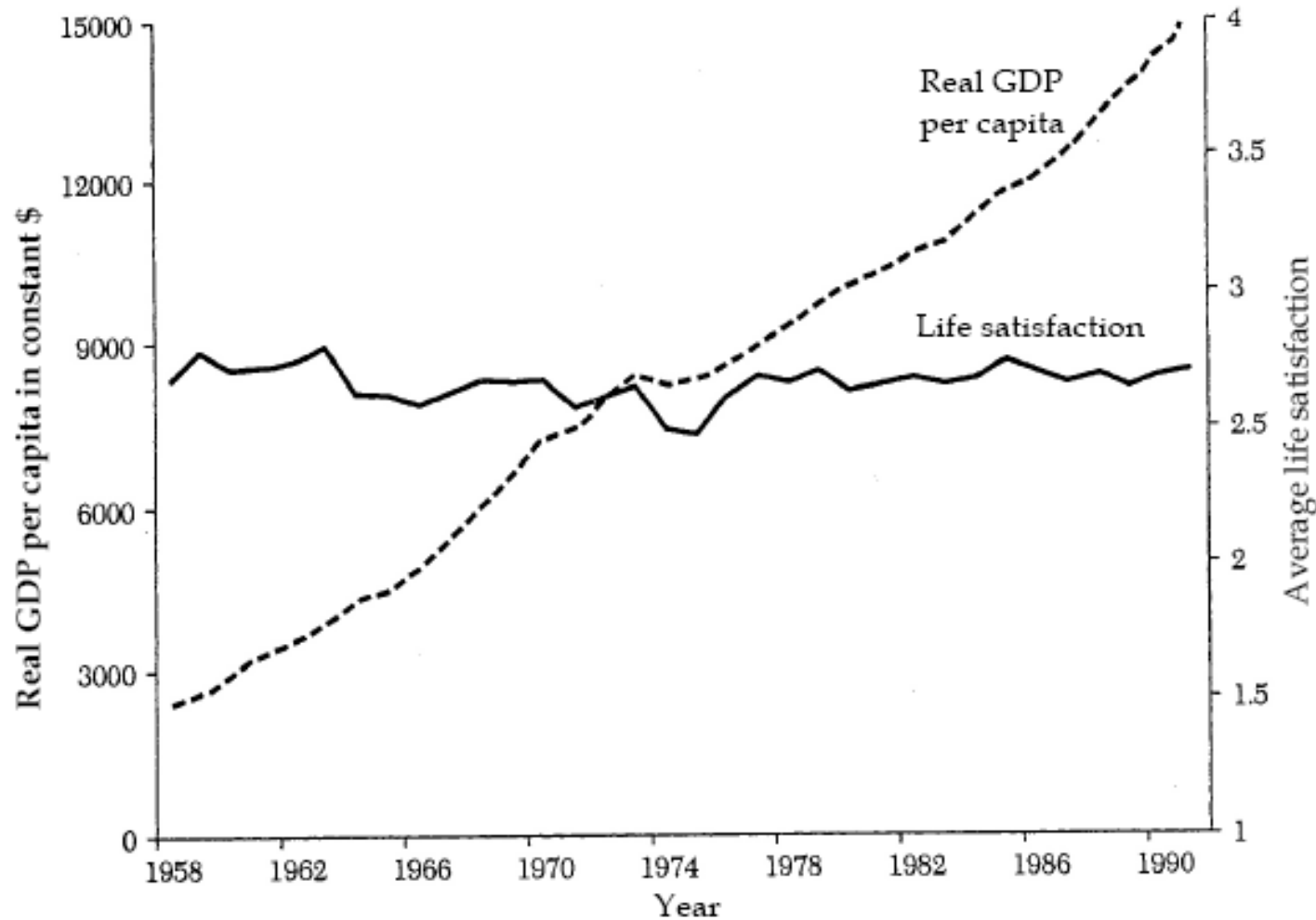


Figure 2. Satisfaction with Life and Income Per Capita in Japan between 1958 and 1991

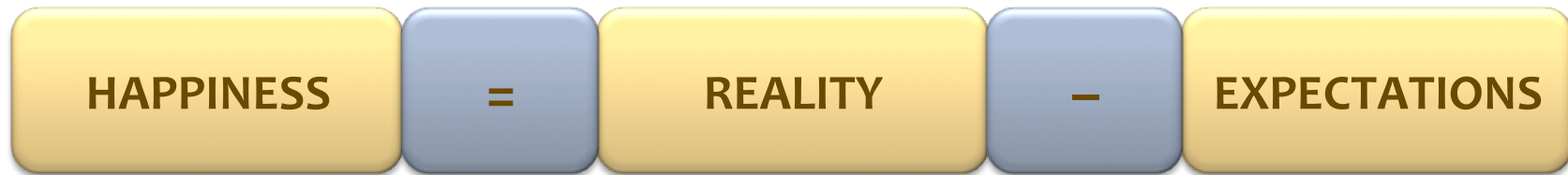


Happiness in different activities

	Happiness (index)	Average hours per day
Sex	4.7	0.2
Socialising after work	4.1	1.1
Dinner	4.0	0.8
Relaxing	3.9	2.2
Lunch	3.9	0.6
Exercising	3.8	0.2
Praying	3.8	0.5
Socialising at work	3.8	1.1
Watching TV	3.6	2.2
Phone at home	3.5	0.9
Napping	3.3	0.9
Cooking	3.2	1.1
Shopping	3.2	0.4
Computer at home	3.1	0.5
Housework	3.0	1.1
Childcare	3.0	1.1
Evening commute	2.8	0.6
Working	2.7	6.9
Morning commute	2.0	0.4

Note: Based on Day Reconstruction Study. Average happiness is net affect.

The First Law of Happiness: Relative Comparison



Expectations Based on Social Comparison



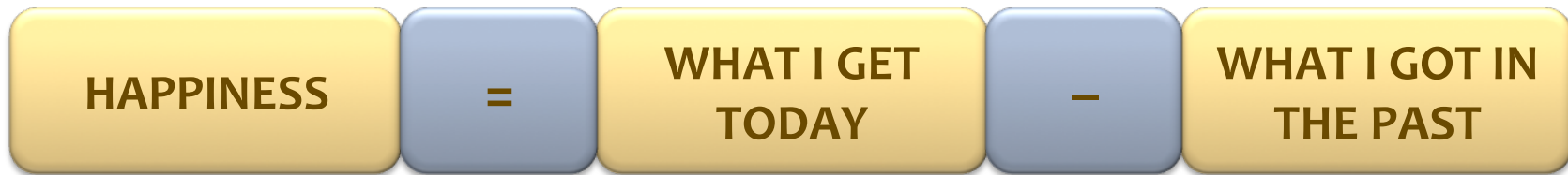
World A

Your current yearly
income is \$50,000;
others earn \$25,000

World B

Your current yearly
income is \$100,000;
others earn \$200,000

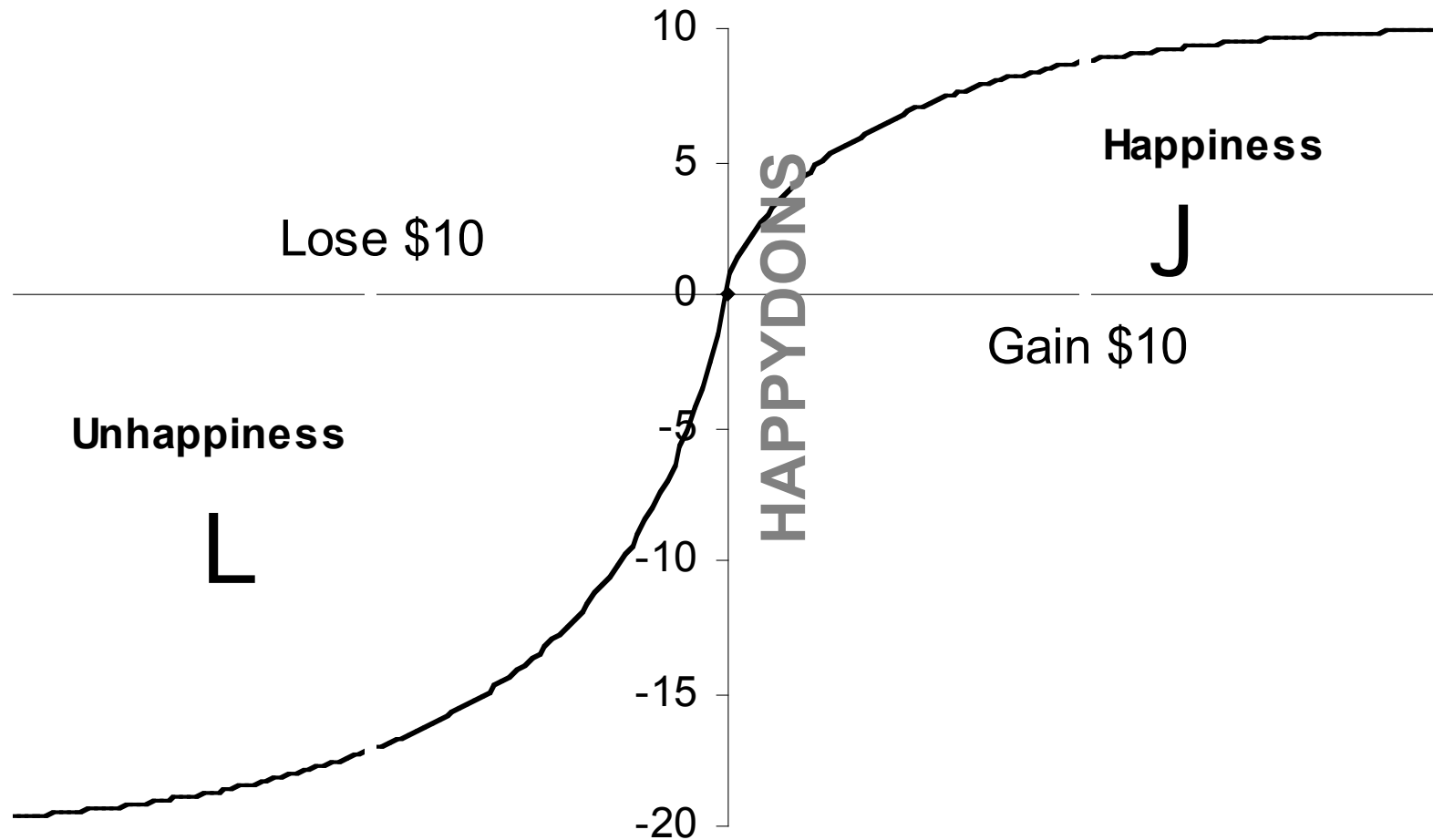
The Second Law of Happiness: Motion of Expectations



Happiness = Reality – Shifting Expectations



The Third Law of Happiness: Aversion to Loss



The Model

HAPPINESS =

S-curve of

REALITY – SHIFTING EXPECTATIONS

adjusted for

SATIATION



Combined Habituation-Satiation Model

$$U(x_1, x_2, \dots, x_T) = \sum_{t=1}^T [v(y_t + x_t - r_t) - v(y_t)]$$

$$y_t = \gamma(x_{t-1} - r_{t-1} + y_{t-1}); \quad 0 \leq \gamma \leq 1, y_1 \text{ given.}$$

$$r_t = \alpha x_{t-1} + (1 - \alpha)r_{t-1}; \quad 0 \leq \alpha \leq 1, r_1 \text{ given.}$$

- Notice that $(x-r)$, and not x , is the driver of satiation.



Implications of the Laws

- Crescendo (less to more)
- Life Simplicity



Krka



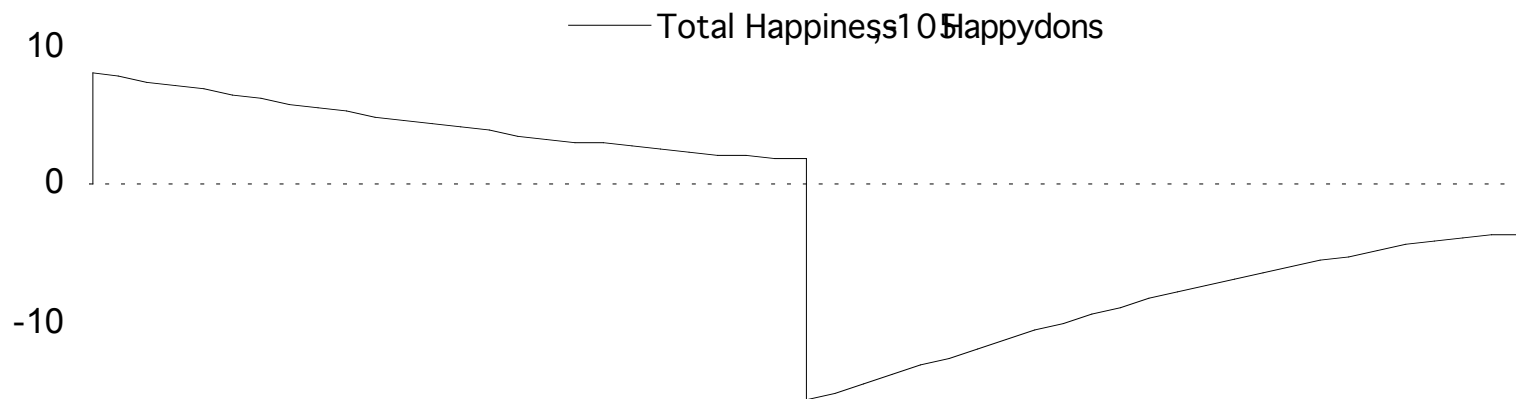
Plitvicka



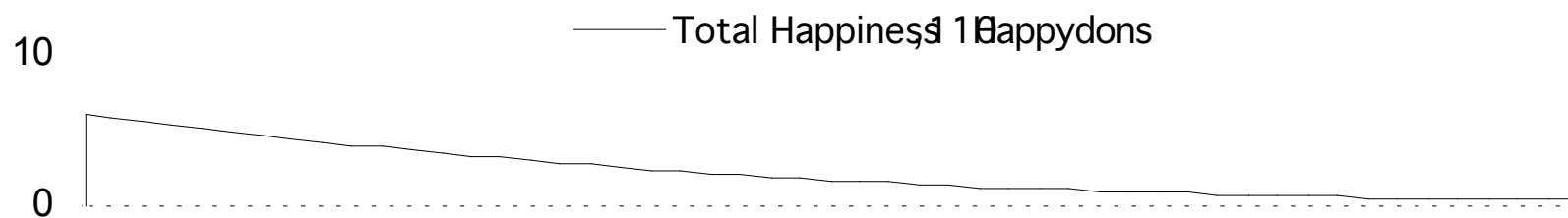
Jack



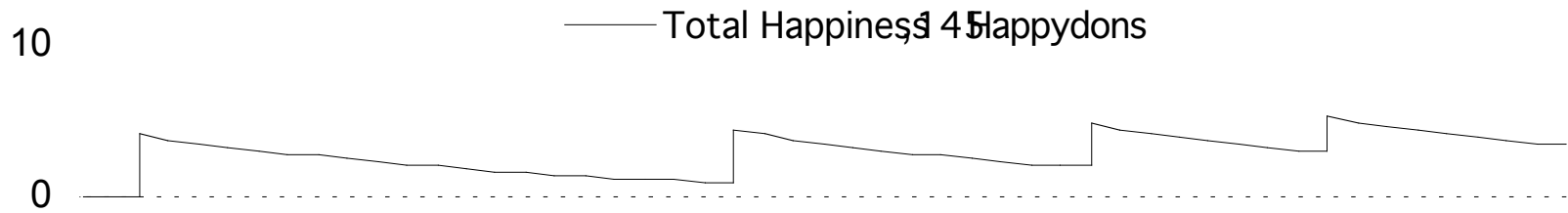
Month	0	5	10	15	20	25	26	30	35	40	45	50
	Porsche						Bus					
Reality	4	4	4	4	4	4	0	0	0	0	0	0
Expectation	0.0	1.6	2.6	3.2	3.5	3.7	3.7	2.2	1.3	0.8	0.5	0.3
R - E	4.0	2.4	1.4	0.8	0.5	0.3	-3.7	-2.2	-1.3	-0.8	-0.5	-0.3
Happiness	8	7	5	4	3	2	-16	-13	-9	-7	-5	-4



Frank



Mariah



Old Habits Die Hard

$$\textit{Wanting} = u(x - r) - u(-r)$$

$$\textit{Liking} = u(x - r)$$

$$\textit{Withdrawal} = -u(-r)$$



Life Simplicity

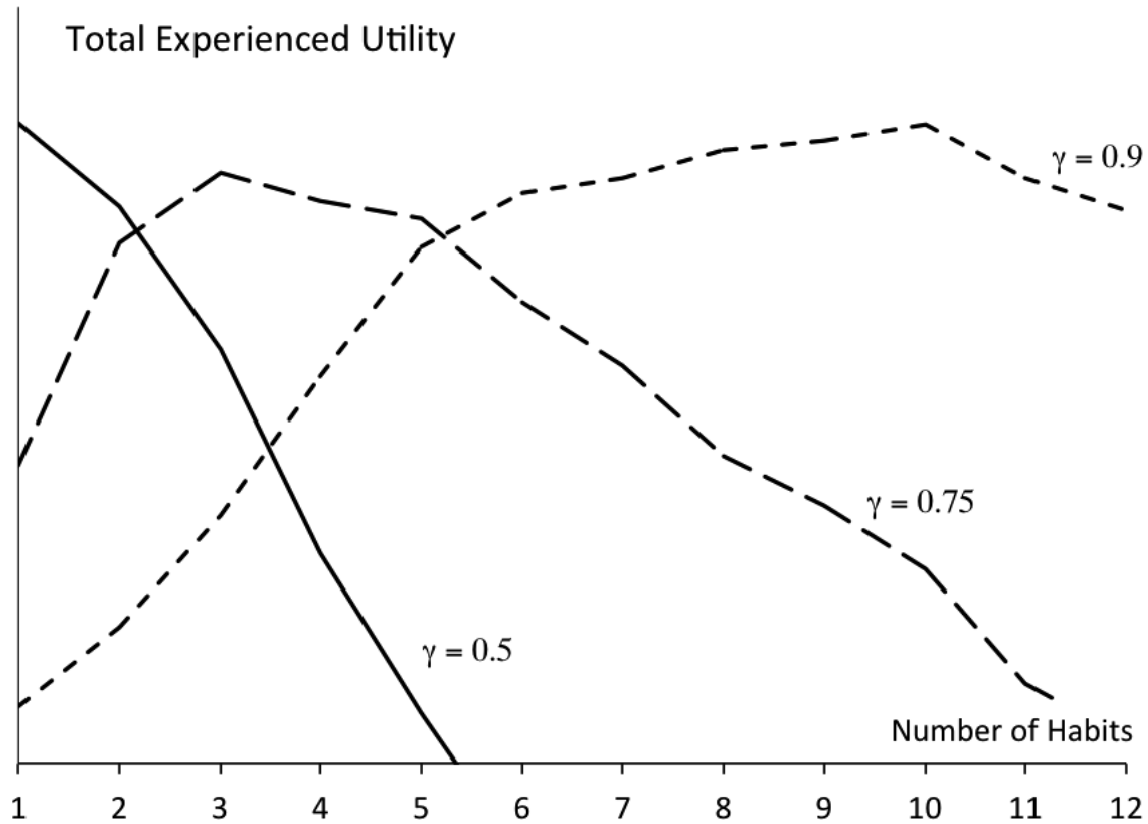


Figure 4: Total utility associated with the number of different habits [$T = 120$ periods, $\alpha = 0.04$]



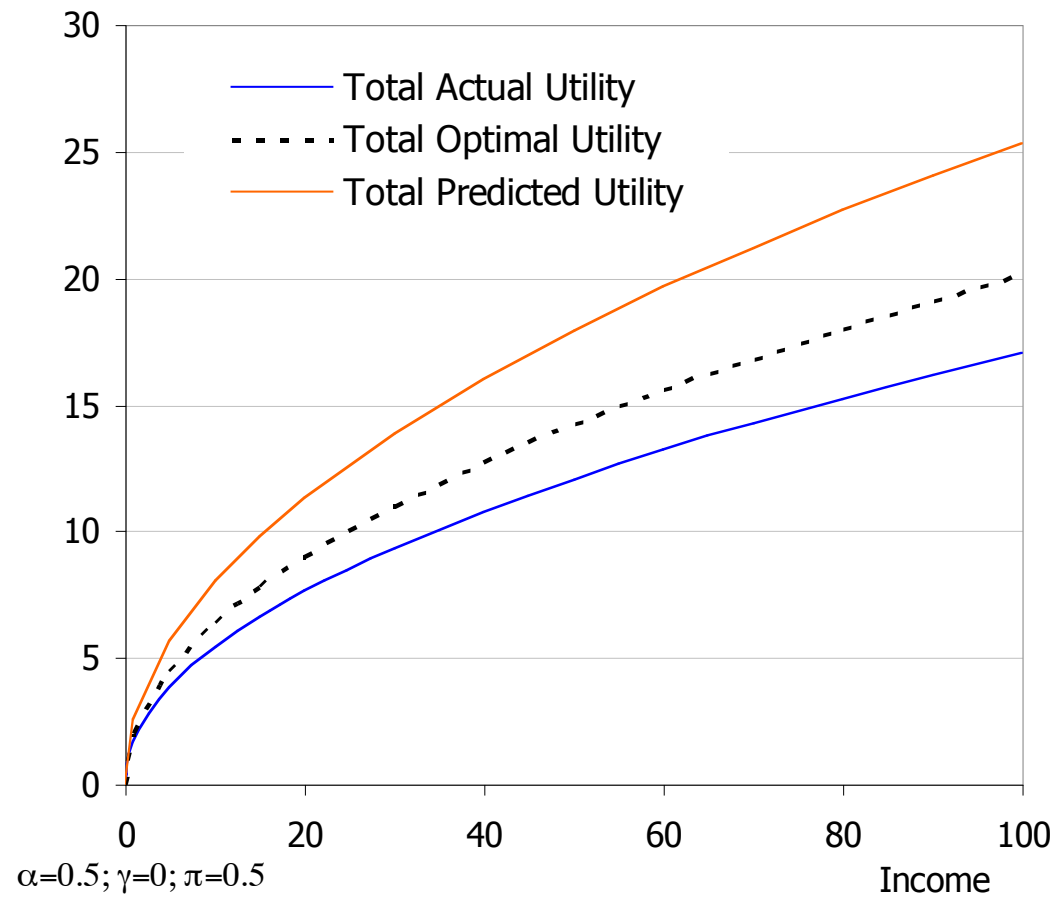
“The great source of both the misery and disorders of human life, seems to arise from over-rating the difference between one permanent situation and another.”

— *Adam Smith, The Theory of Moral Sentiments, 1790, Part III, Chapter III*

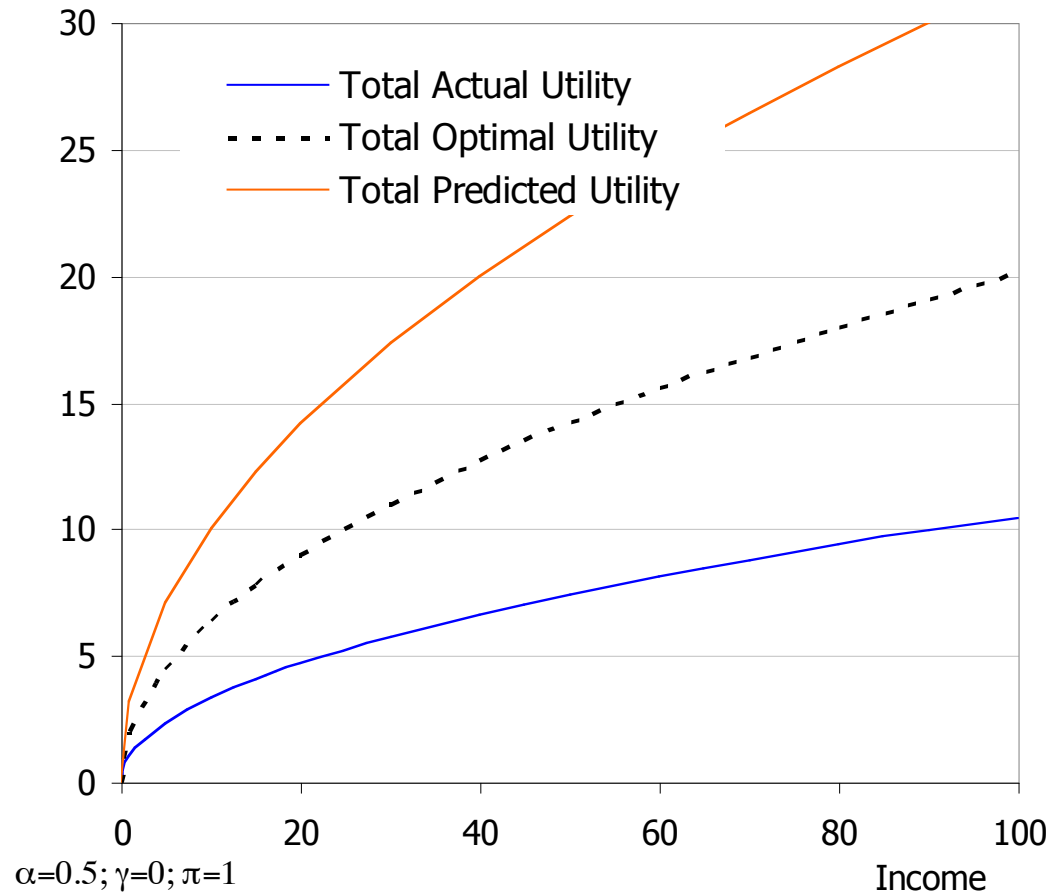
Are We Good at Predicting Happiness?



Utility of Income under Projection Bias



Utility of Income under Projection Bias



Happiness and Time Allocation Model

$$V(\mathbf{l}, \mathbf{c}) = \sum_{t=1}^T u(\ell_t) + \sum_{t=1}^T v(c_t - r_t), \quad (1)$$

$$r_t = \sigma s_t + (1 - \sigma)a_t, \quad t = 1, \dots, T, \quad (2)$$

$$a_t = \alpha c_{t-1} + (1 - \alpha)a_{t-1}, \quad t = 2, \dots, T, \quad (3)$$

where a_1 and s_t , $t = 1, \dots, T$, are given.

$$\ell_t + w_t \leq 1, \quad t = 1, \dots, T, \quad \text{and} \quad (4)$$

$$\sum_{t=1}^T c_t \leq \mu \sum_{t=1}^T w_t. \quad (5)$$



Is X A Basic Good?

1. If nobody knew I am buying or experiencing X , would I still want X ?
2. Will I enjoy X in the future, say five years from now, as much as I do now?



Happiness = Accumulated Reality

- Shifting Expectations



Cumulative Goods

$$X = (x_1, x_1 + x_2, \dots, x_1 + x_2 + \dots + x_T)$$

$$U(X) = \sum_{t=1}^T u(X_t - a_t)$$

$$a_t = a_{t-1} + \alpha(X_t - a_t),$$

in which

$$X_t = \sum_{s=1}^t x_s$$



Summary

- Happiness is a choice
 - HAPPINESS = REALITY – SHIFTING EXPECTATIONS
 - Crescendo Strategy (less to more)
 - Basic goods
 - Cumulative goods
 - Reframing
 - HAPPINESS SEISMOGRAM
-

A Quote

No one saves us but ourselves. No one can and no one may. We ourselves must walk the path.

— ***Buddha***



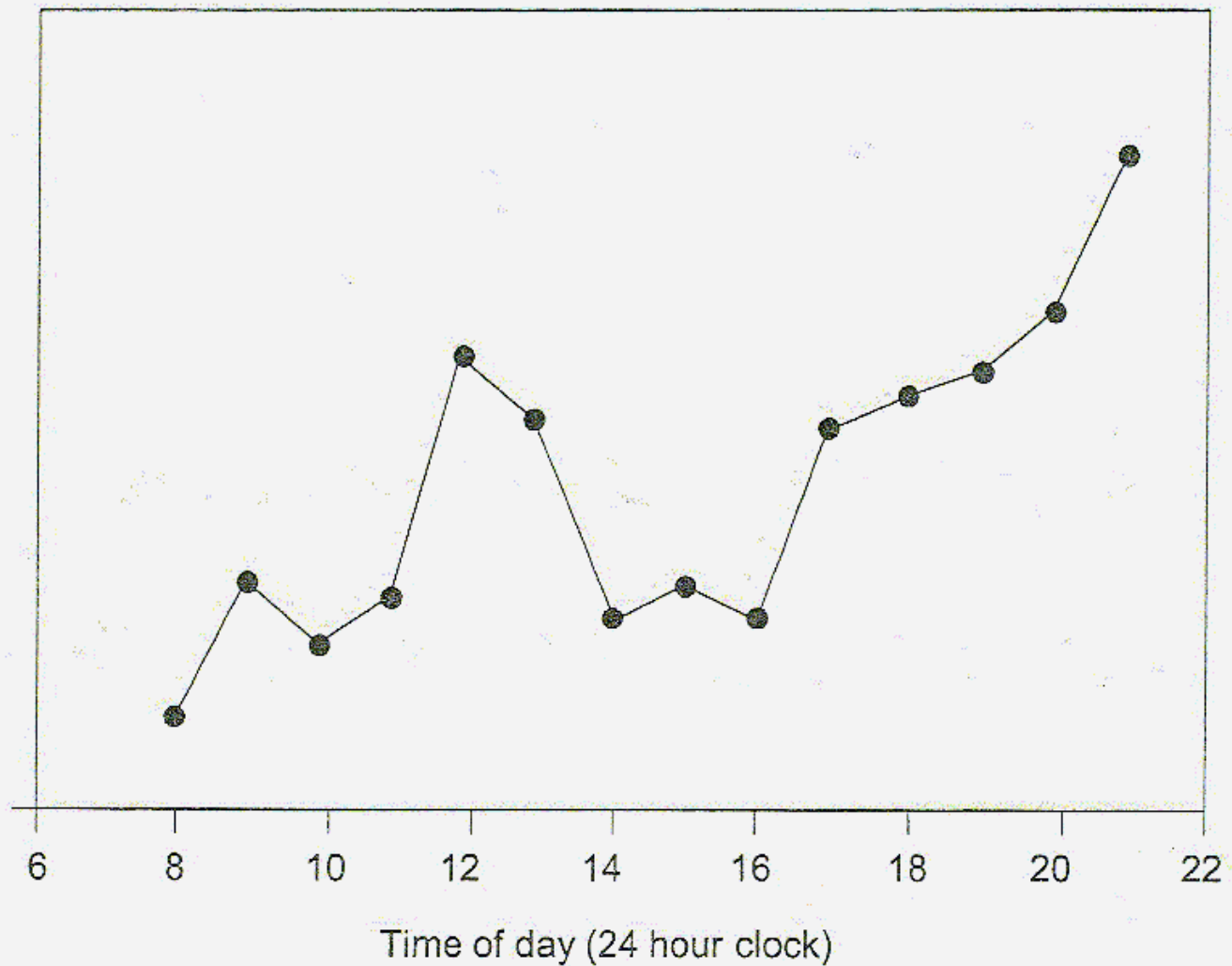
Management Implications

- Managing Expectations
 - Customers
 - Employees
 - Investors
 - Perceived Progress
 - Connectedness (basic good)
 - Higher Purpose
-

Public Policy

- People do not always know what will give them lasting happiness
 - Unemployment
 - Health Care
 - Secure Retirement
 - Child Care & Early Education
 - Strengthen Marriage & Family
 - Treat Mental Illness
 - Trust & Confidence in Public Officials
-

Average happiness through the day



A Japanese Cyclist Contemplates a Volkswagen Beetle / REUTERS



Recapitulation

- We propose a model of adaptation and social comparison for valuing time streams of consumption. This model explains two widely observed empirical findings in the well-being literature.
 - The first empirical finding is that within a society richer people are happier than poorer ones.
 - The second finding is that for a given country average well-being has not improved over time in spite of large gains in per capita income.
- Why do people believe that more money will buy more happiness when in fact it does not?
 - We show that under projection bias this puzzle is resolved as a person will predict much more happiness than he will actually realize because of his failure to account for changes in reference levels that accompany higher levels of consumption.



Partial Adaptation

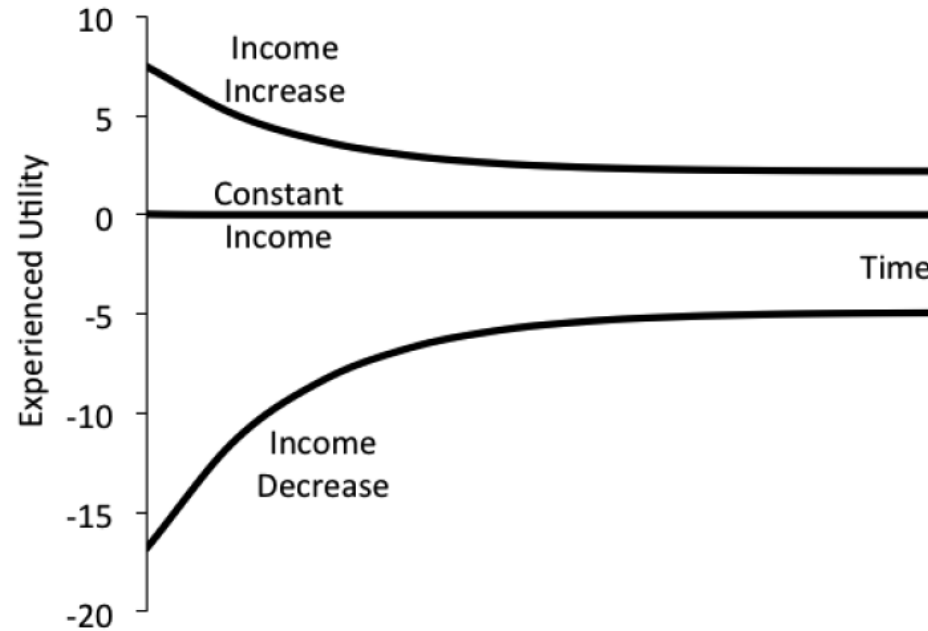


Figure 1: Illustration of partial adaptation. Following a income increase, satisfaction increases abruptly, then reverts and settles in a level somewhat higher than before the windfall. A symmetric pattern holds for losses.

Life Balance

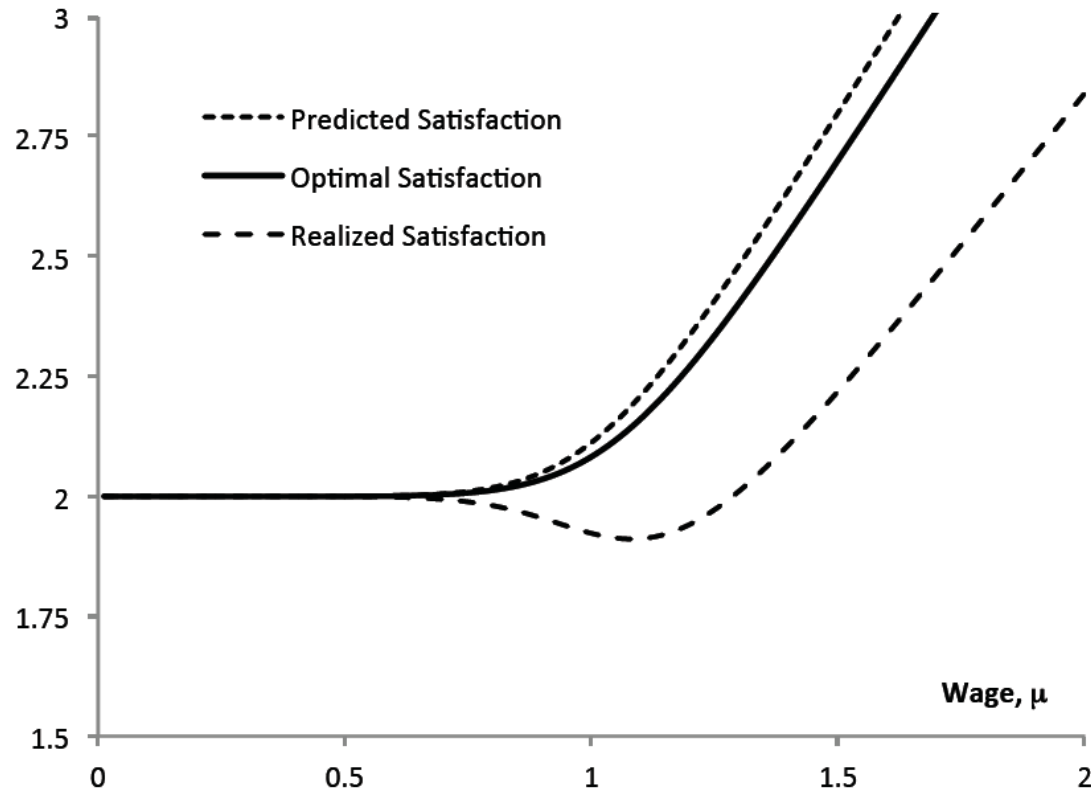


Figure 5: $u(\ell) = \ell^\beta$ and $v(c) = c^\beta$, $\beta = \pi = \alpha = 0.9$. Predicted, Optimal, and Realized satisfaction as a function of the wage, μ . For $\mu \in (0, 1.1)$, higher wages decrease realized satisfaction.

“One does not become happy overnight, but with patient labor day after day. Happiness is constructed, and that requires effort and time. In order to become happy, we have to learn how to change ourselves.”

— Luca and Francesco Cavalli-Sforza (2007)



Figure 6: Total Optimal Time Spent on Spiritual Practices and Total Utility as a Function of the Effectiveness of These Practices

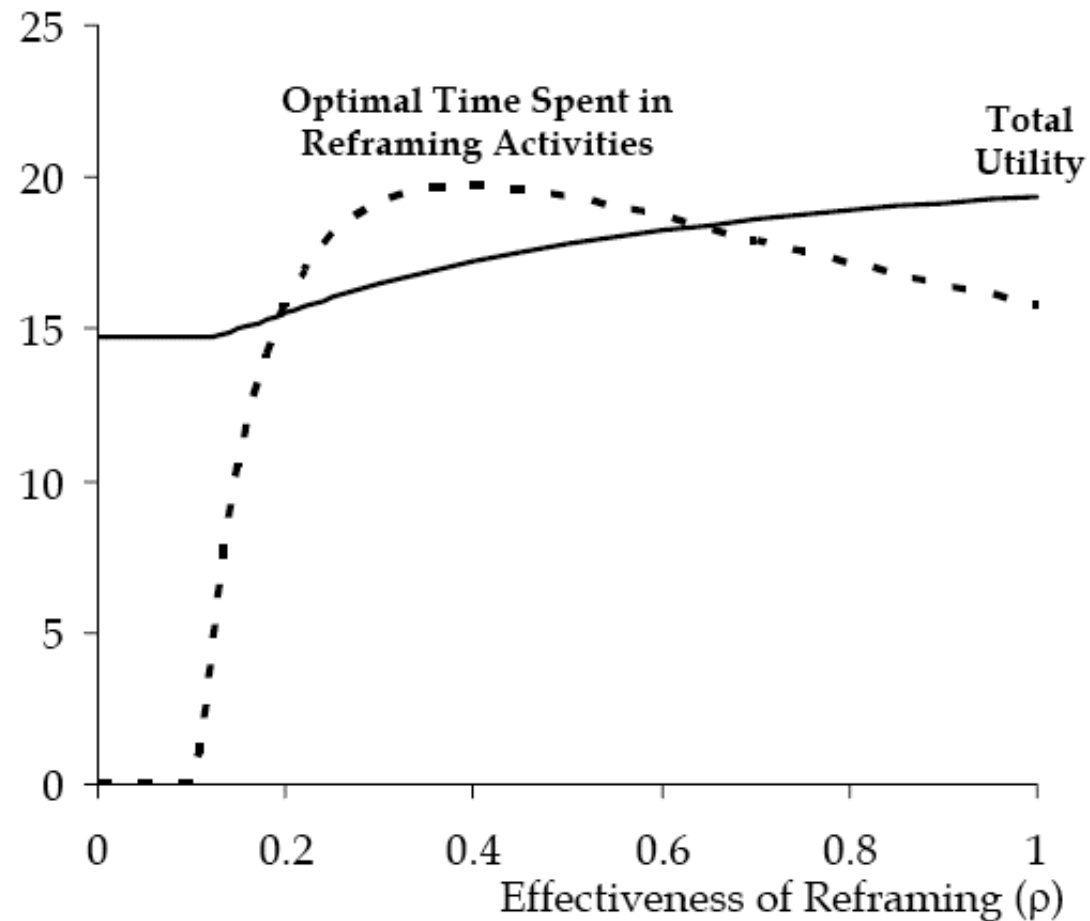
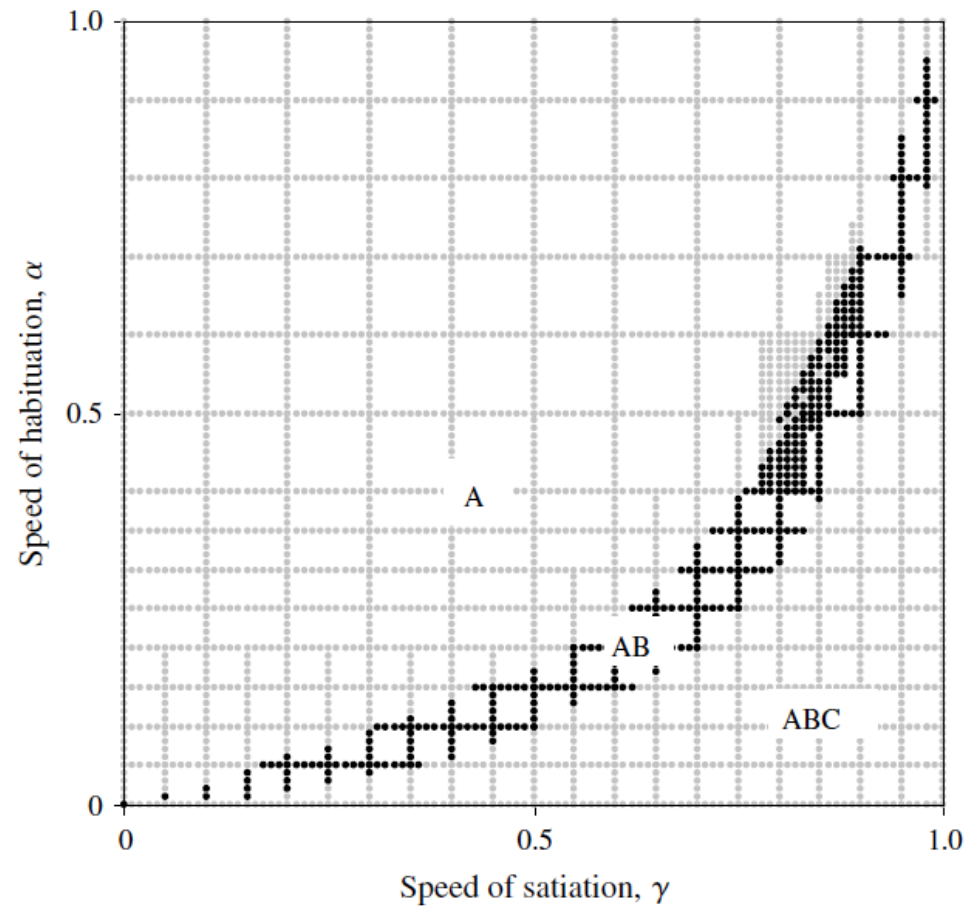


Table 1. The Satisfaction with Life Scale

DIRECTIONS: Below are five statements with which you may agree or disagree. Using the 1-7 scale below, indicate your agreement with each item by placing the appropriate number in the line preceding that item. Please be open and honest in your responding. 1 = Strongly Disagree; 2 = Disagree; 3 = Slightly Disagree; 4 = Neither Agree or Disagree; 5 = Slightly Agree; 6 = Agree; 7 = Strongly Agree

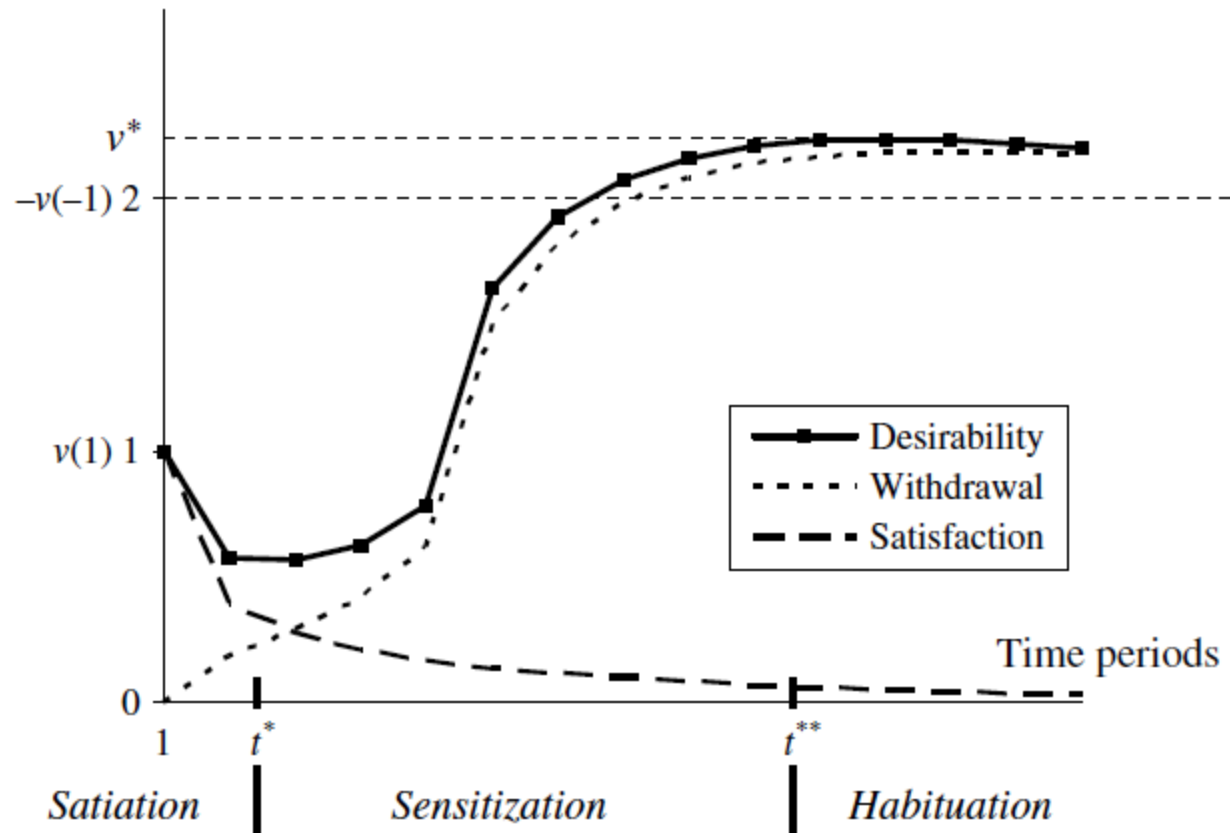
- _____ a. In most ways my life is close to my ideal.
 - _____ b. The conditions of my life are excellent.
 - _____ c. I am satisfied with my life.
 - _____ d. So far I have gotten the important thing I want in life.
 - _____ e. If I could live my life over, I would change almost nothing.
-
-

Figure 6 Optimal Amount of Variety as a Function of the Common Speed of Satiation and Habituation



Notes. In the first region (upper left gray zone), we only initiate the habit of *A*. In the second region (middle black zone), we consume goods *A* and *B*. In the third region (bottom right gray zone) we acquire habits for *A*, *B*, and *C*.

Figure 3 Comparison of the Desirability for One Unit of Consumption After Repeated Consumption of One Unit



Note. $v(x) = x^{1/2}$, $x \geq 0$; $v(x) = -2|x|^{1/2}$, $x < 0$; $\gamma = 0.6$; $\alpha = 0.25$.

Time Allocation

Optimal and Under Projection Bias

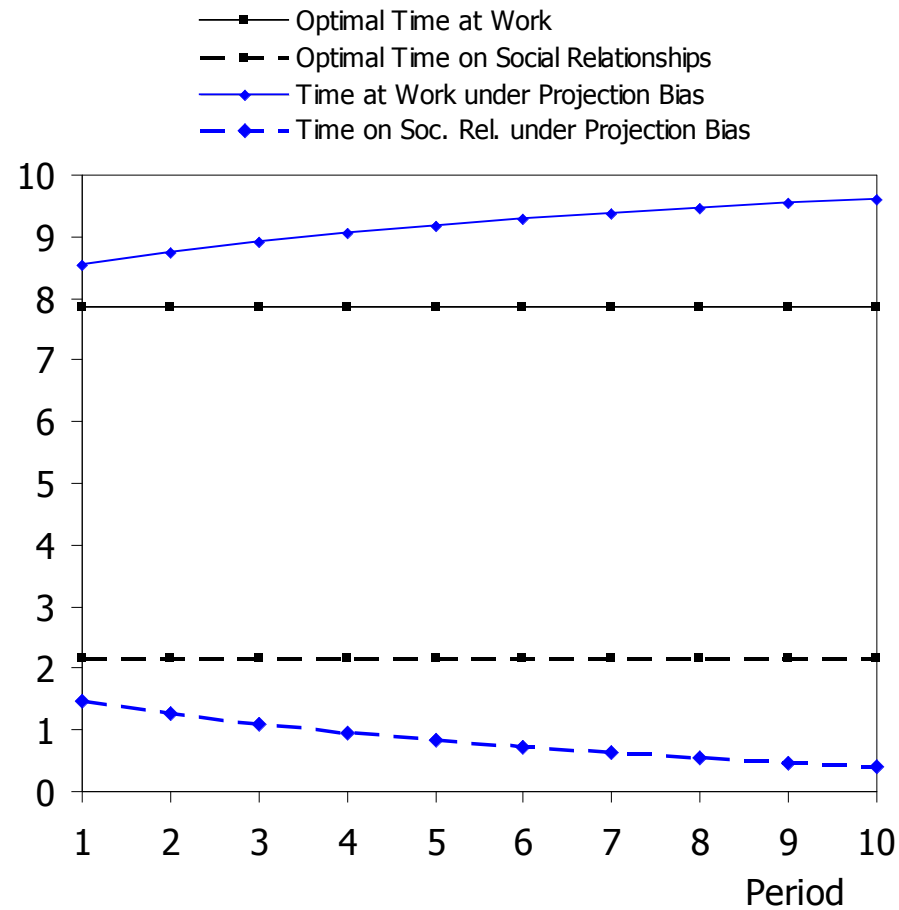
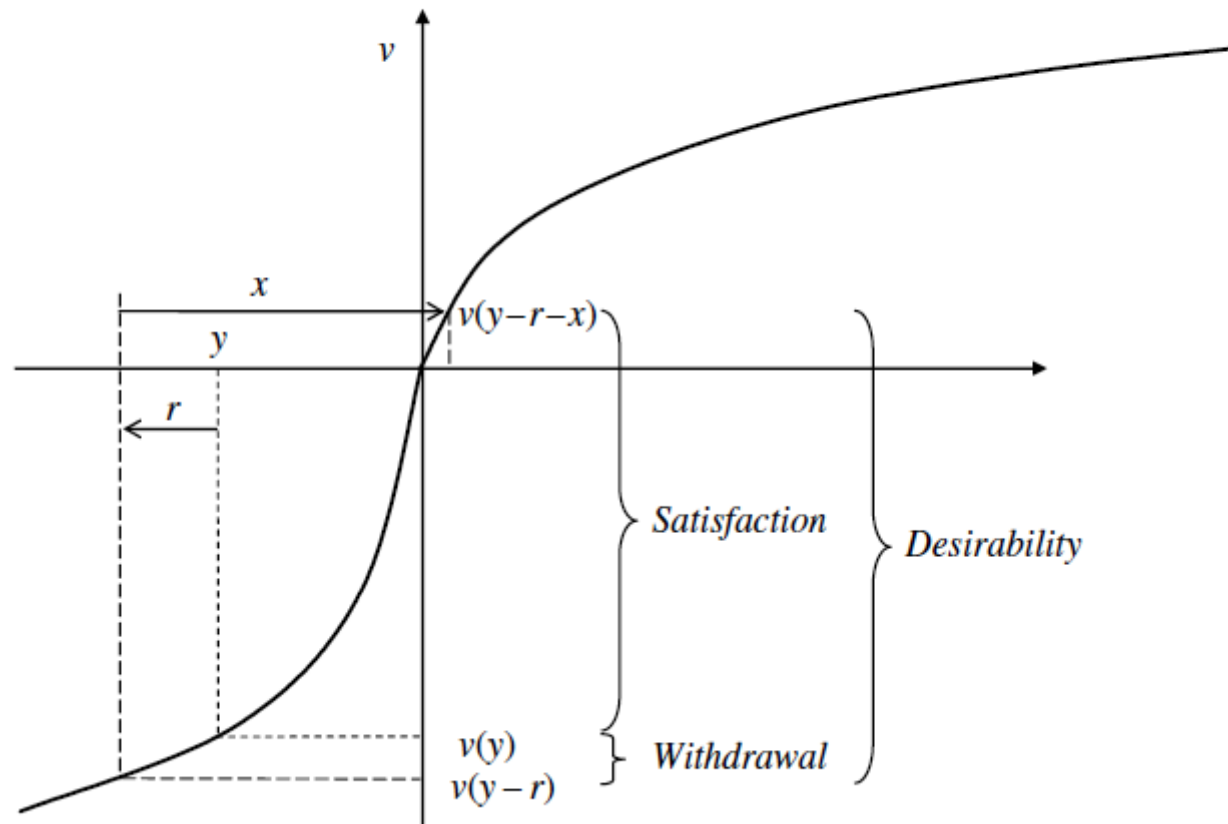


Figure 4 Craving Occurs After Accumulating Negative Levels of Satiation



“The constitution only gives you the right to pursue happiness. You have to catch it yourself.”

— Benjamin Franklin



Life Balance Chakra

