

100 Days of Summer

Konstantin Augemberg

www.measuredme.com

Measured Me initiative:

- ultimate personal system for self-tracking, self-discovery and self-optimization
- “self-search engine”

me^{gle}

how did recent apartment search and move affect my wellbeing

Search

Life Hacker' s Wet Dream:

- ✓ *self-accountability*
- ✓ *self-optimization*
- ✓ *self-discovery & life mining*
- ✓ *life logging*
- ✓ *self-preservation*
- ✓ (NOT SO DISTANT FUTURE) *personal API* (Netflix, Google, restaurants, etc.)
- ✓ ... possibilities are endless

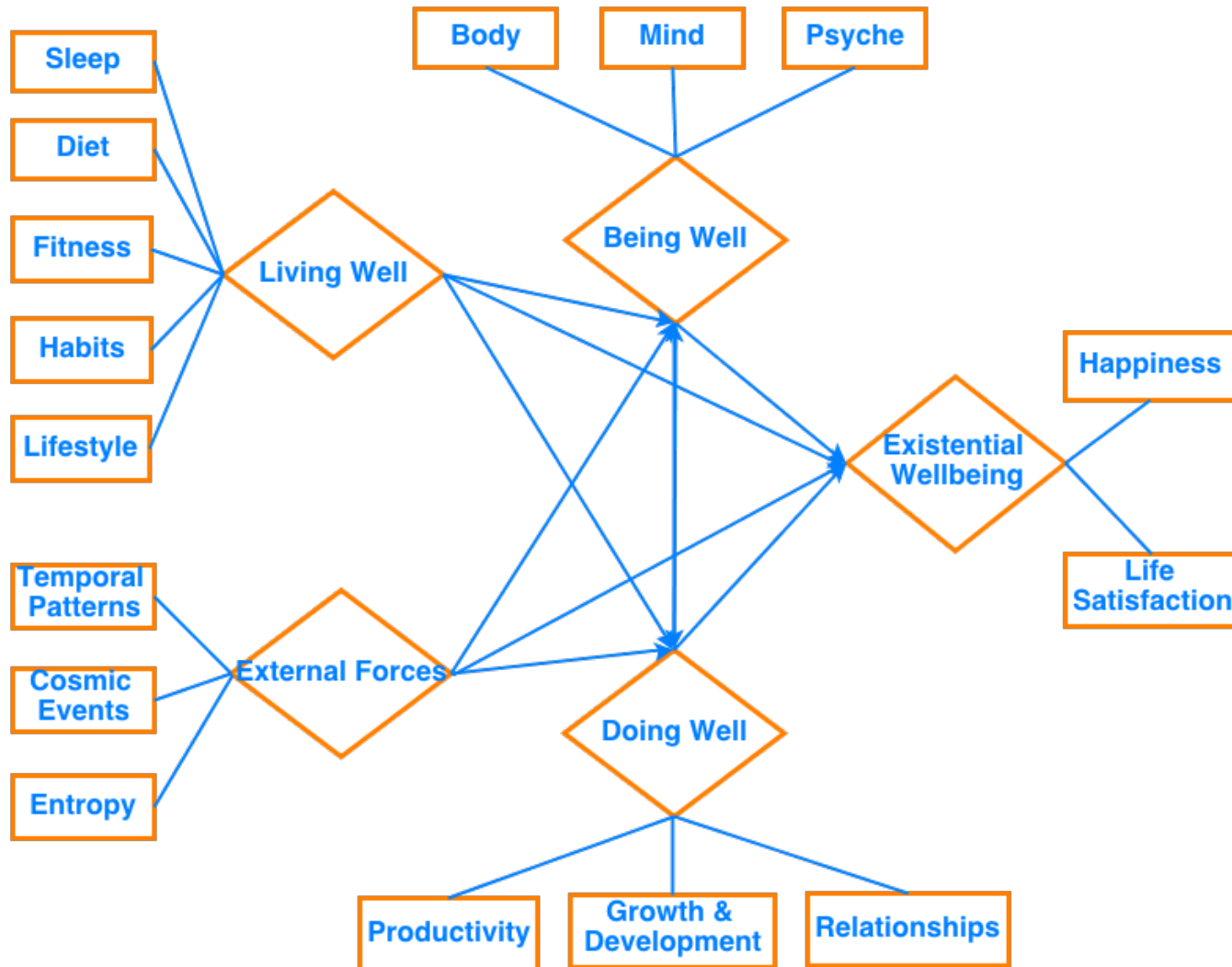
Criteria:

- self-centric*
- quantitative*
- parsimonious*
- holistic*
- purposeful*

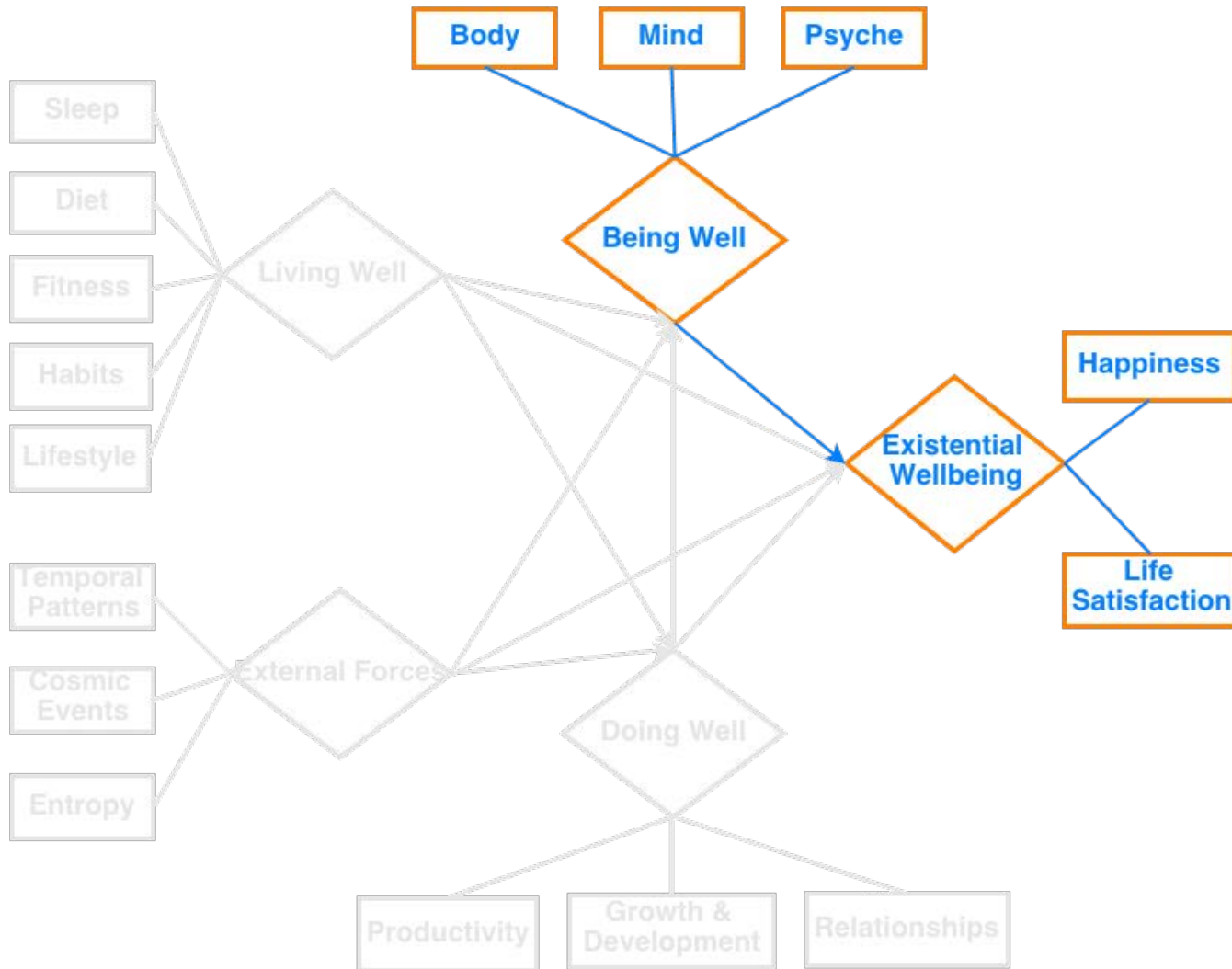
Objective: WELLBEING

- **well-be·ing** (wlbng) *n.* The state of being healthy, happy, or prosperous

Framework: Tracking SELF through the lens of WELLBEING



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Metrics of Wellbeing

Body:

- *Health*: presence/severity of symptoms or health conditions
- *Energy*: how tired/energetic I feel

Psyche:

- *Stress*: how stressed I feel
- *Emotions Positivity*: how positive/negative do I feel
- *Emotions Intensity*: how calm/tense do I feel

Mind:

- *Alertness*: Psychomotor Vigilance Test
- *Executive Cognition*: Stroop Test

Existential Wellbeing:

- *Happiness*: how happy I am
- *Life Satisfaction*: six Ryff's Psychological Wellbeing questions

Quantified Summer

What I Did:

- 8 metrics
- 4x a day (6 am – 9 am, 9 am – 12 pm, 12 pm – 5 pm, 5 pm – 11 pm)
- 100 days (May 27 – September 3)

What I Learned:

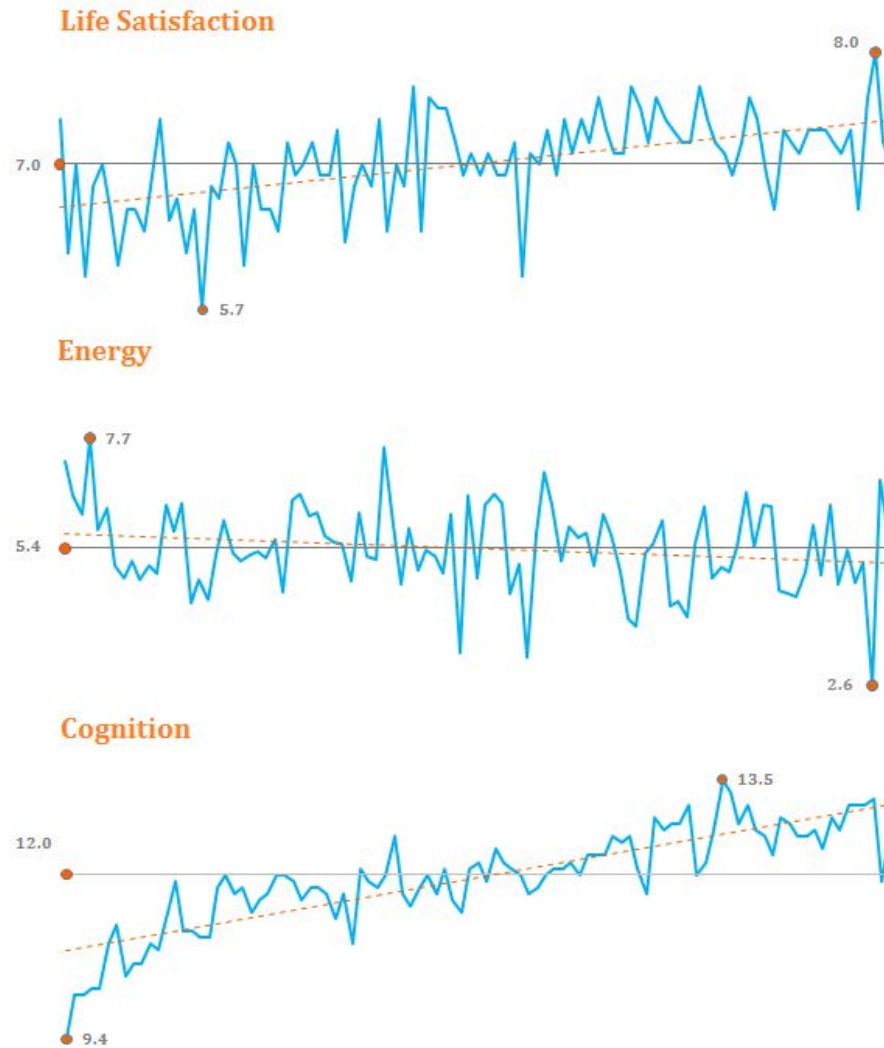
- Trackability
- Trends
- Intra-Day Variability
- Redundancy
- Temporal and Other Patterns

Trackability: Quick and “On the Go”

- how long does it take to measure and log each metric
- difficulty ~ % of missing data (< 10% = low, 11%-30% medium, 31%> - high)

Indicator	Average Time (Sec)	Difficulty	Conclusion
Health	10	Low	Good to go
Energy	10	Low	Good to go
Stress	10	Low	Good to go
Emotional State	20	Low	Good to go
Alertness	120	Medium	Ok to go; alternatives?
Cognition	180	Medium	Ok to go; alternatives?
Happiness	15	Low	Good to go
Life Satisfaction	60	Low	Good to go

Trends: Some Indicators Are Not Stationary



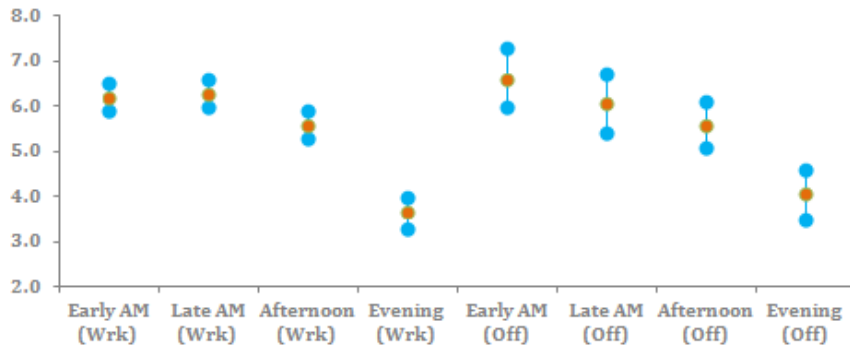
Weekdays vs Weekends: A Tale of Two “Me”s

Unless you are Tim Ferris, you live two different lives: workdays vs. off-work days

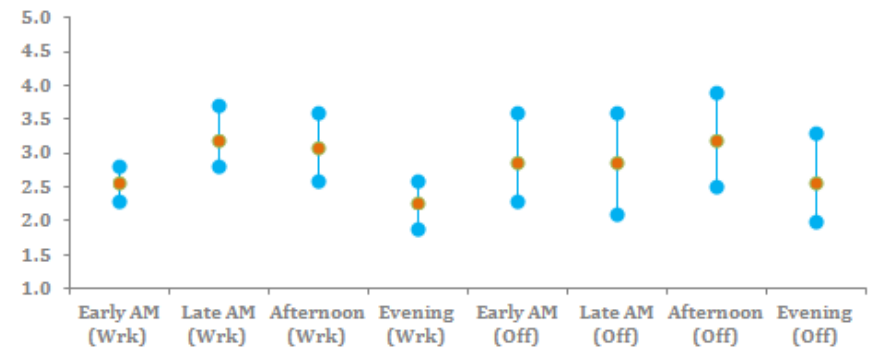
- Social Rhythm
- 9 to 5 workdays: structured, stable and predictable
- Off-workdays (weekends, vacations): diverse, unstable and unpredictable

Intra-Day Variability: From f(Dawn) to f(Dusk)

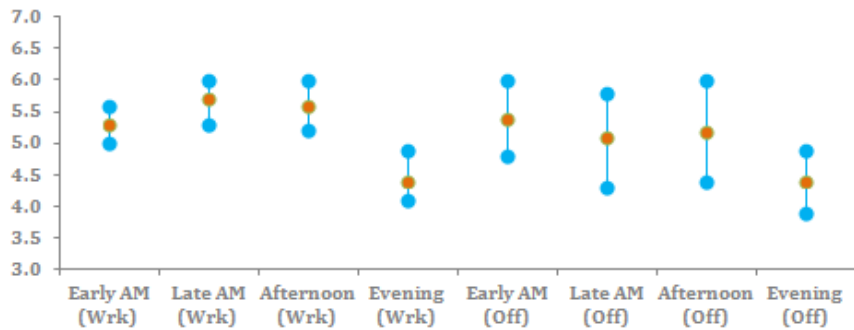
Energy



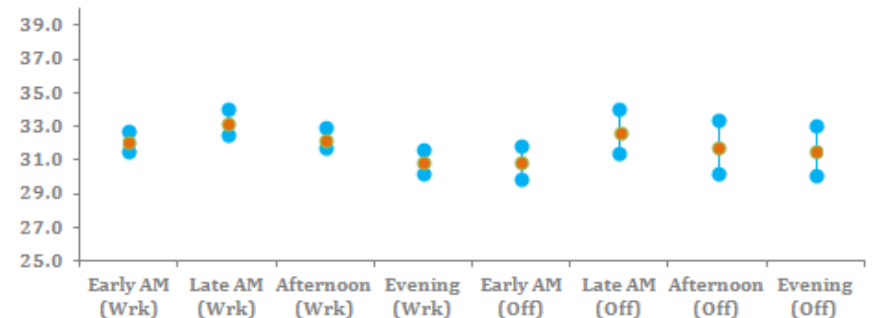
Stress



Emotions | Intensity



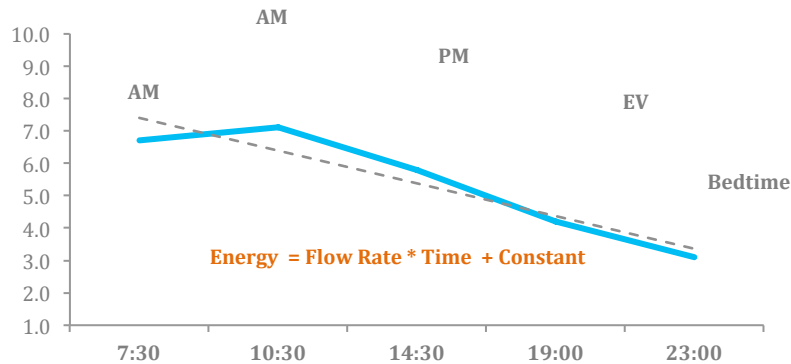
Mental Alertness



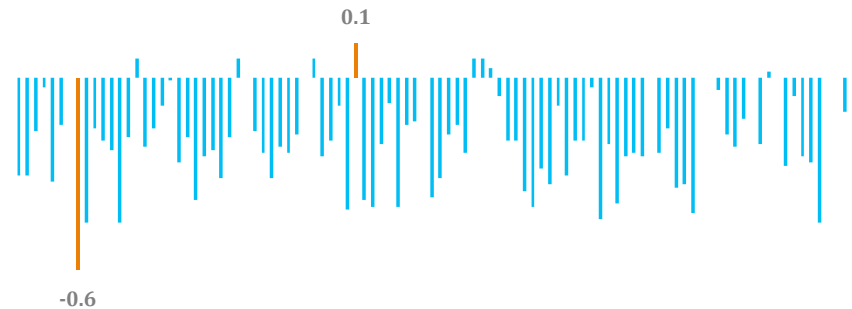
Intra-Day Variability: Bonus Metrics!

Energy Flow Rate: how fast do I get tired?

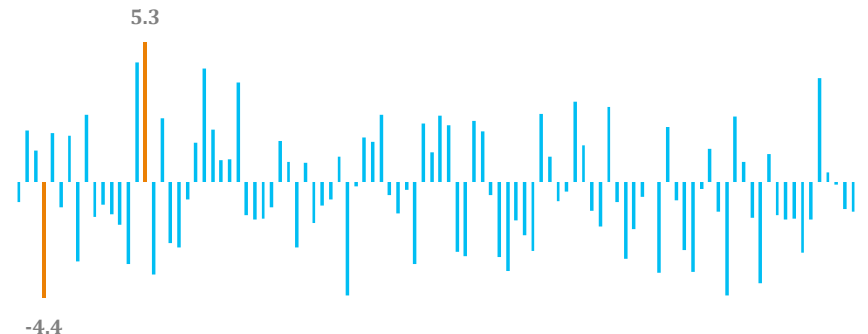
- Log energy levels at least 2-3 times a day
- Fit linear regression model; slope = “flow rate”



Daily Energy Flow in Summer 2013



Daily Mood Swings in Summer 2013



Emotional Stability (ak.a. “mood swings”)

- Log emotions’ positivity/intensity 2-3 times a day
- $ES = \text{variance}(\text{positivity}) + \text{variance}(\text{intensity})$
- $ES = \text{absmax}(\text{Positivity}_{PM} - \text{Positivity}_{AM}, \text{Positivity}_{EV} - \text{Positivity}_{PM})$

Redundancy: Unique and Relatively Independent

Happiness	.67	.03	.32	-.31	.51	.04	-.06	-.11
.68	Life Satisf.	.05	.29	-.26	.40	.03	-.07	-.11
.11	.17	Health	-.11	-.08	.08	-.04	-.03	.07
.42	.38	.09	Energy	-.14	.32	.13	.10	.04
-.17	-.24	-.07	-.09	Stress	-.41	.25	-.02	0.05
.41	.29	-.04	.30	-.27	Emotions Positivity	.05	-.04	-.10
.13	.11	.14	.20	.28	.09	Emotions Intensity	-.15	-.06
.25	.18	.04	.15	.03	.00	.16	Alertness	.02
.11	.06	-.02	.22	-.01	-.16	.16	.08	Executive

- Spearman's rank correlations ρ ; statistical significance defined by 90% confidence interval
- **workdays correlations** shown in blue, **off-workdays** in orange;
- statistically non-significant correlations are shown in grey

Lifestyle Impact

Sleep (ρ , causality established):

	Actual Sleep Time	
	Work Days	Off-Work Days
Happiness	-.23	
Mental Alertness		.51
Executive Cognition	-.29	

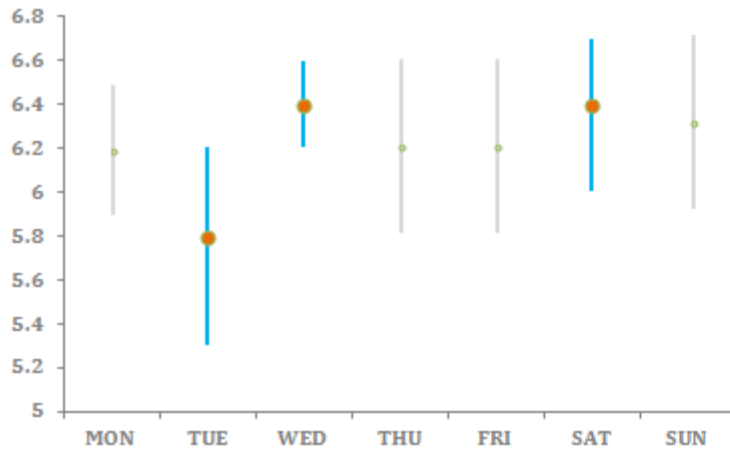
Physical Activity (ρ , no causality established)

	Work Days				Off-Work Days			
	Calories	Steps	Moder. Act.	Vigor. Act.	Calories	Steps	Moder. Act.	Vigor. Act.
Mental Alertness	-.27	-.30	-.31			.41		
Stress			.24					
Energy				.24				

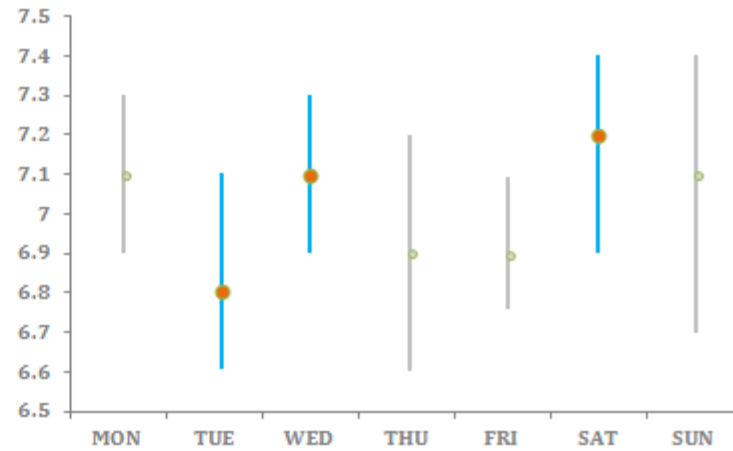
Temporal Patterns

Weekday Patterns

Happiness



Life Satisfaction



Temporal Patterns

Biorhythms Theory

Physical = $\sin(2\pi t/23)$

Emotional = $\sin(2\pi t/28)$, *t = number of days since birth*

Cognitive = $\sin(2\pi t/33)$



External Forces

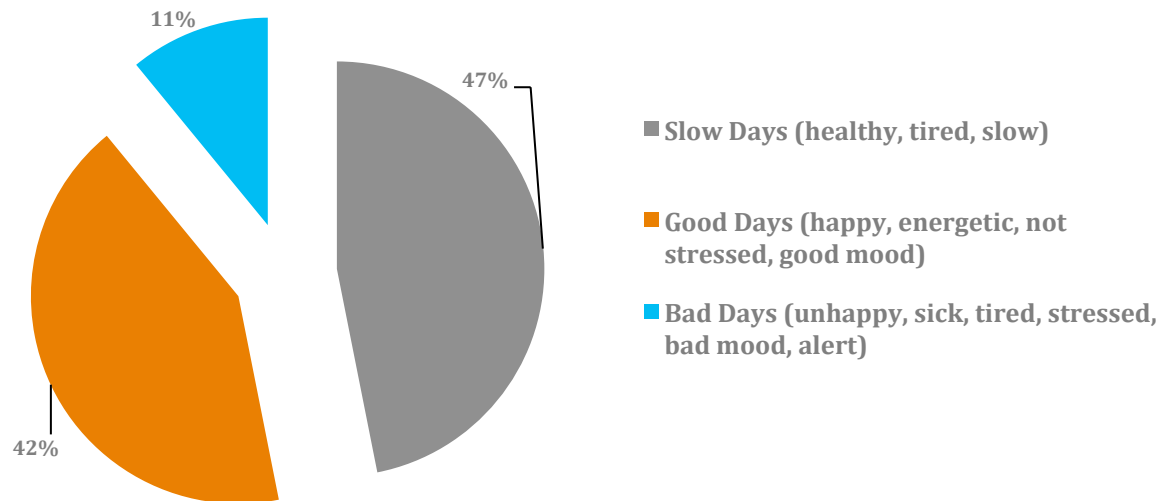
- Heat (ave T > 80F) = lower stress, more positive and less intense emotions
- Rain: no effects
- Barometric pressure: no effects
- First Moon Quarter = high stress; Last Moon Quarter = low stress

Life Mining

- how does my perfect day look like?
- are there certain “types” of days?
- can I predict my day based on morning indicators?
- can I predict how certain “milestones” will affect my life?
- can I apply technical stock trading signals and other pattern-based analytics to my life stream?

Typology of Days:

- 8-dimensional classification model (k-means cluster analysis)
- 3 types of work days:



Next steps:

Quantified Winter (Nov 2013 – Feb 2014):

- **Health:** incorporate occasional biometric/ (blood pressure, cholesterol, c-reactive protein) data into daily health score
- **Sleep Quality:** potential body/mind/psyche indicator that 'concludes' picture of the day
- **Cognition:** search for more effective and comprehensive cognitive tests
- **Logging:** reduce number of measurement to 1-2 a day for some indicators
- **Doing Well:** productivity, creativity, strength of will and social support metrics
- **Living Well:** diet, lifestyle quotient and social rhythm metrics

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