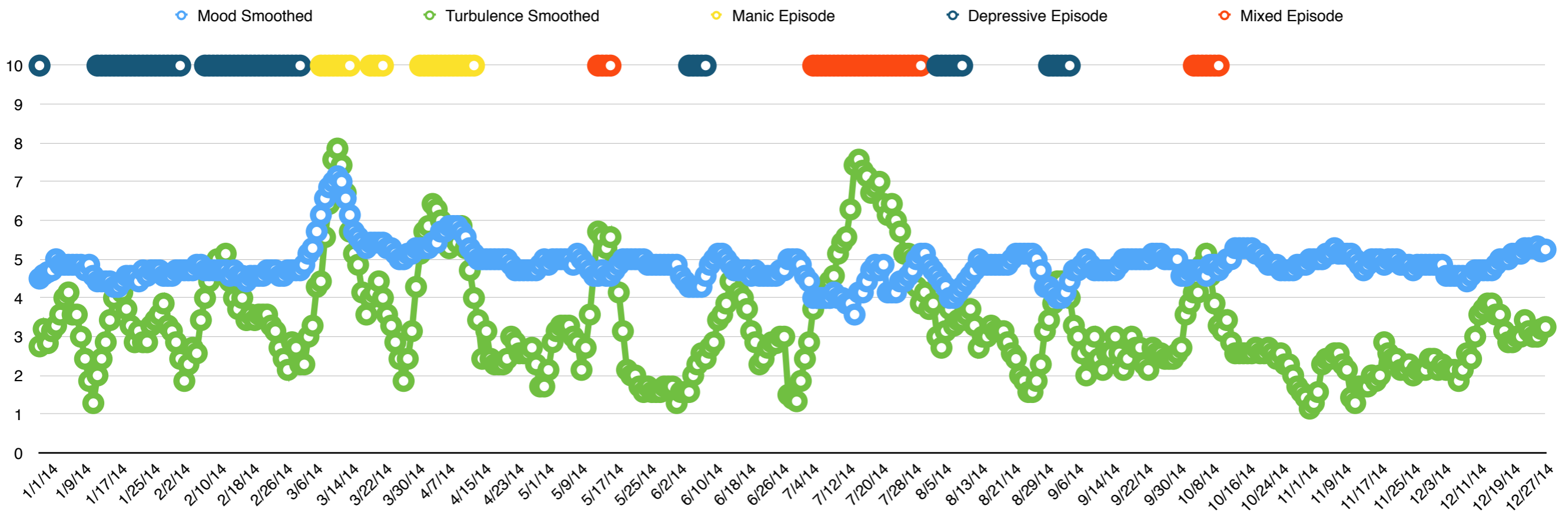




Mood Tracking: My Key to Managing Bipolar Disorder

Michael Caruso, MS
May 4th, 2015



What is Bipolar Disorder?

- Mood Disorder
 - Affects personal experiences of emotion
 - Alters affect
- Bipolar

Euthymia



What Triggers Mood Episodes?

Positive and Negative Life Events



Stress



Circadian Rhythm
Disruption

Emotional Dysregulation



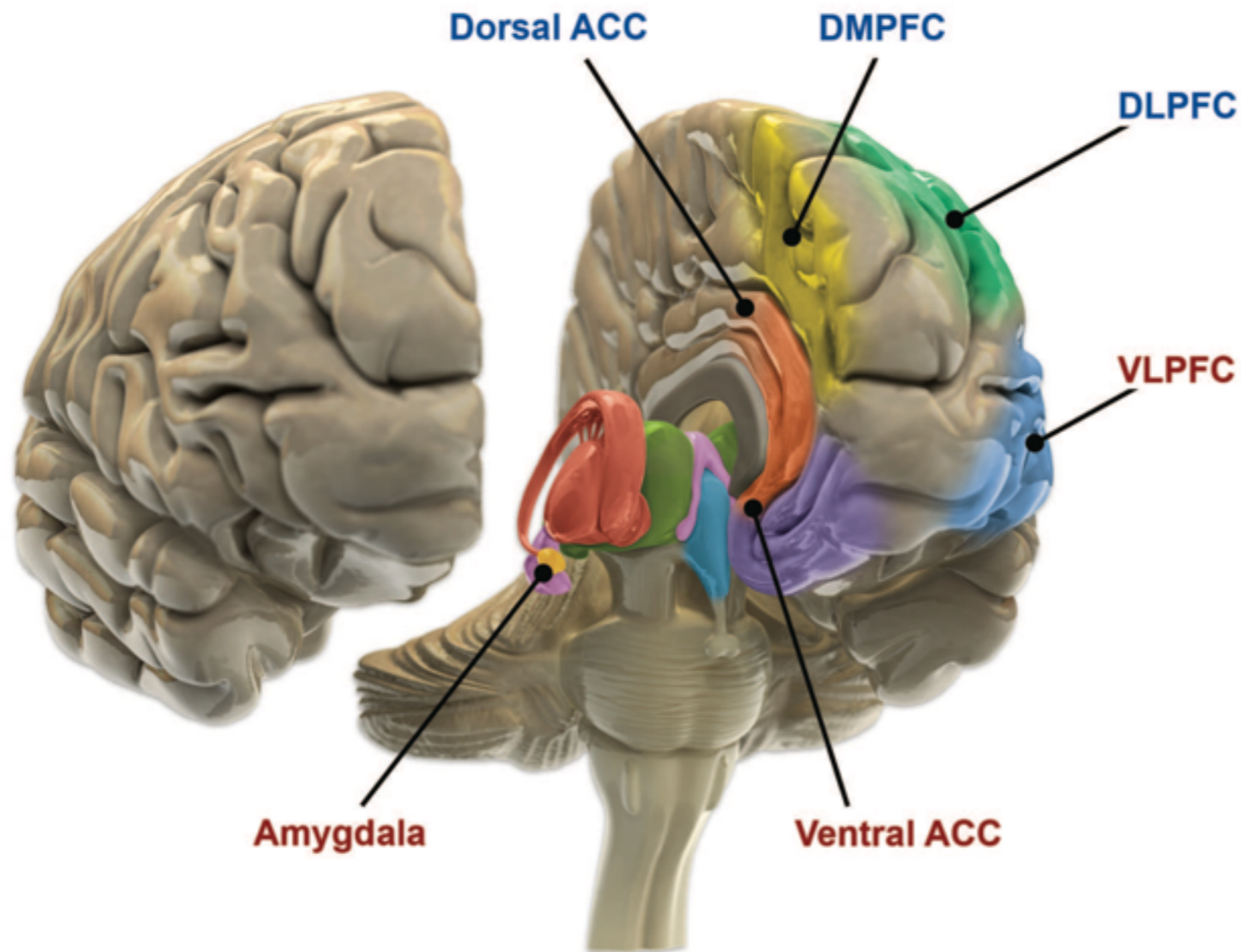
Salience Network



How do we choose what is relevant to guide our behavior?



Emotional vs Executive Control



Executive Control

Decreased Responsiveness

(Salience Network)

Emotional Control

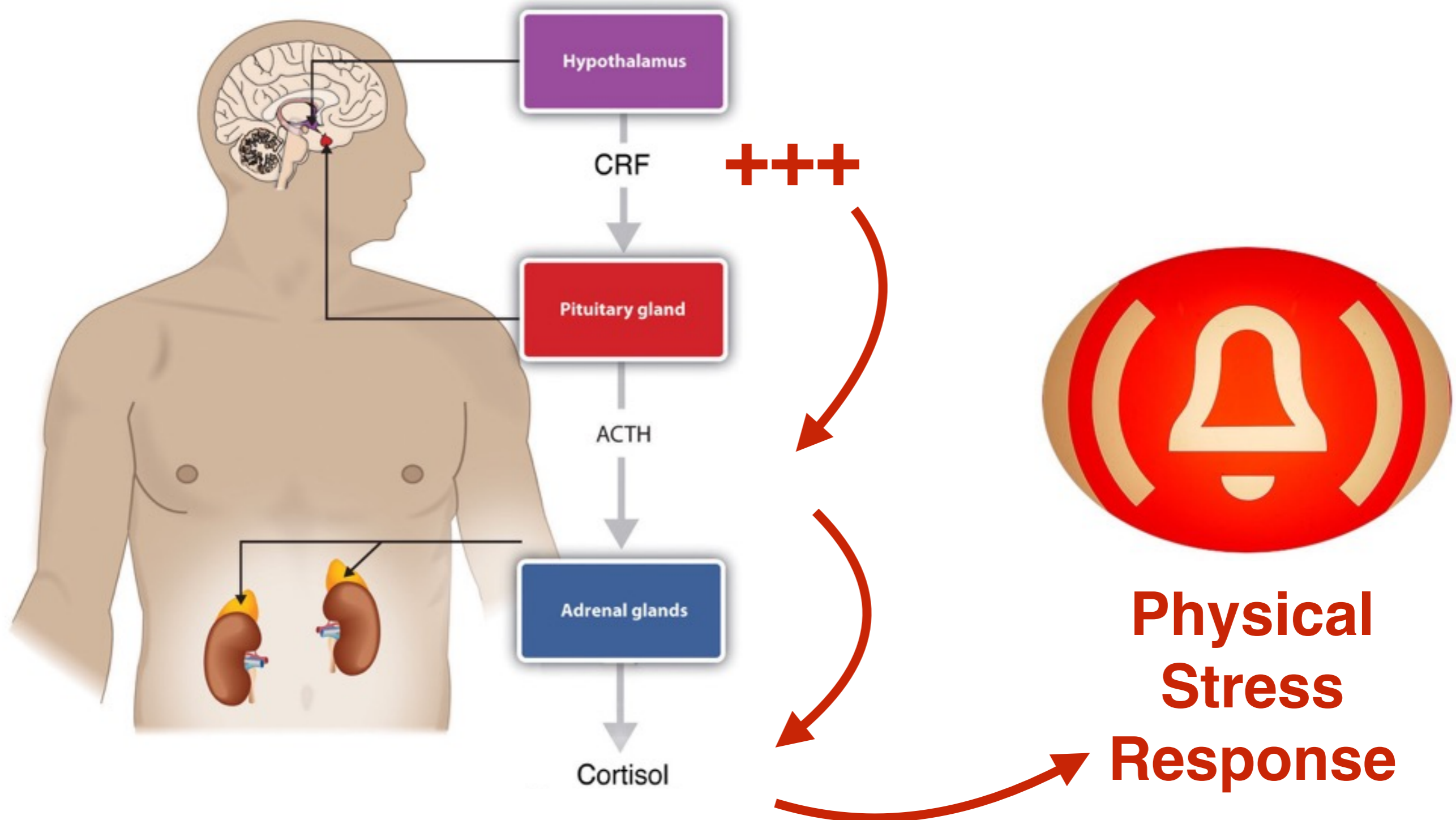
Increased Responsiveness

DLPFC: Dorsolateral prefrontal cortex
VLPFC: Ventrolateral prefrontal cortex

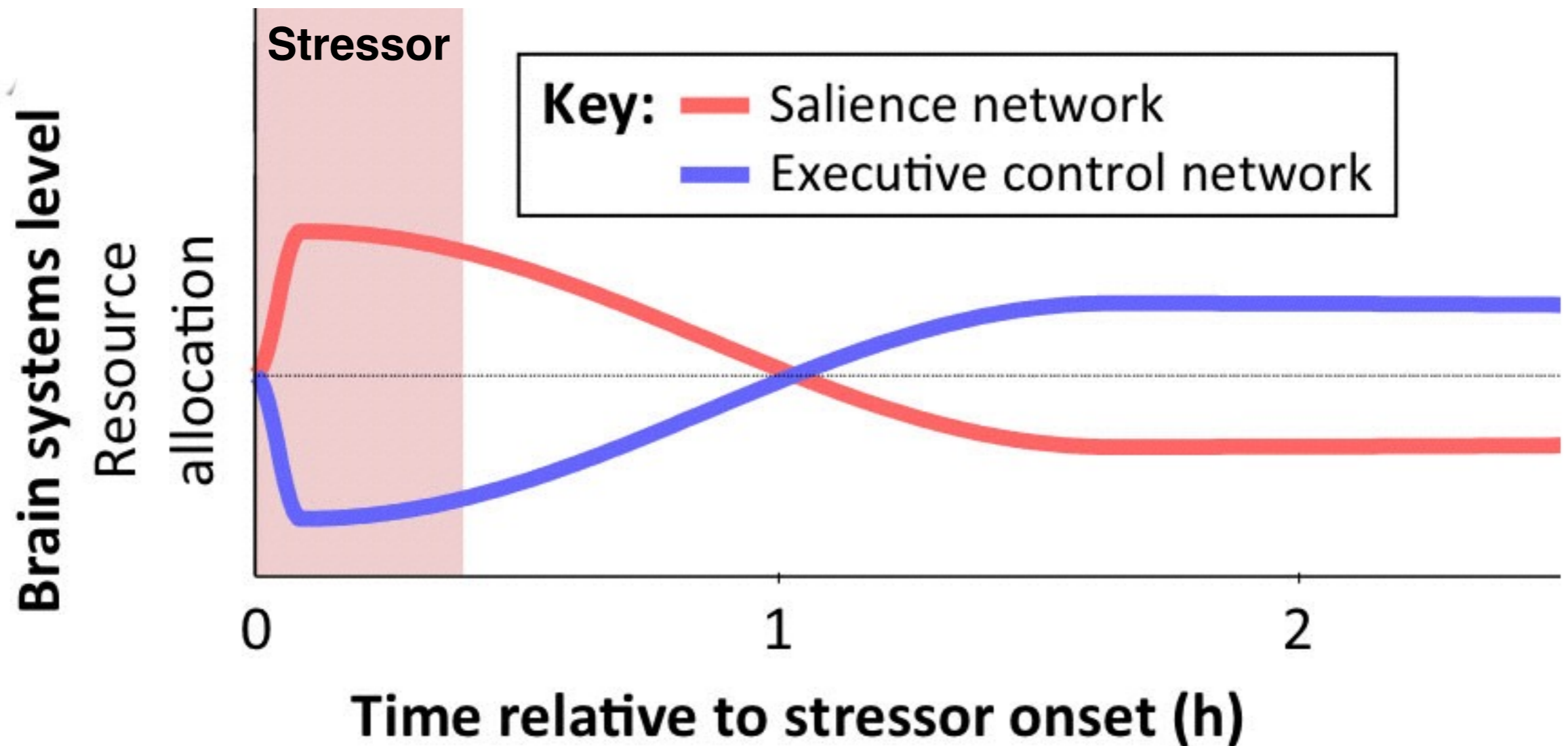
DMPFC: Dorsomedial prefrontal cortex
ACC: Anterior cingulate cortex

Maletic and Raison 2014

HPA Axis



Flip in Network Control During Stress Response



Mood Tracking







optimism online

Core Data

Notes

Rate Your Mood Today

1 2 3 4 5 6 7 8 9 10

Very Depressed Very Elevated

Rate the Quality of Your Sleep

1 2 3 4 5 6 7 8 9 10

Very Poor Great Sleep

How Long Did You Exercise Today?

0 10 20 30 40 50 60+

Minutes

Rate How Well You Coped Today

1 2 3 4 5 6 7 8 9 10

Not At All Well Very Well

How Many Hours Did You Sleep?

Did You Take Your Medications?

Yes
 No
 N/A

Stay Well Strategies

- | | | | | |
|--|---|--|---|--|
| <input type="checkbox"/> Adequate Sleep | <input type="checkbox"/> Plenty of Water | <input type="checkbox"/> Professional Support | <input type="checkbox"/> Managing Conflict | <input type="checkbox"/> Positive Thinking |
| <input type="checkbox"/> Exercise | <input type="checkbox"/> Minimal Caffeine | <input type="checkbox"/> Social Support | <input type="checkbox"/> Enjoyable Activities | <input type="checkbox"/> Looking Outwards |
| <input type="checkbox"/> Relaxation/Meditation | <input type="checkbox"/> Minimal Alcohol | <input type="checkbox"/> Alternative Therapies | <input type="checkbox"/> Activities With Others | |
| <input type="checkbox"/> Healthy Meals | <input type="checkbox"/> Medicine Taken | <input type="checkbox"/> Routine Day | <input type="checkbox"/> Time Outside | |

Triggers

- | | | | | |
|---|---|---|---|--|
| <input type="checkbox"/> Stress at Work | <input type="checkbox"/> Too Much to Do | <input type="checkbox"/> Caffeine Consumption | <input type="checkbox"/> Medicine Not Taken | <input type="checkbox"/> Change in Treatment |
| <input type="checkbox"/> Stress at Home | <input type="checkbox"/> Negative Self Talk | <input type="checkbox"/> Alcohol Consumption | <input type="checkbox"/> Ill-health or Pain | <input type="checkbox"/> Change in General |
| <input type="checkbox"/> Lack of Sleep | <input type="checkbox"/> Relationship Problem | <input type="checkbox"/> Poor Diet | <input type="checkbox"/> Difficult Life Changes | |
| <input type="checkbox"/> Lack of Exercise | <input type="checkbox"/> Arguing | <input type="checkbox"/> Recreational Drugs | <input type="checkbox"/> Workplace Changes | |

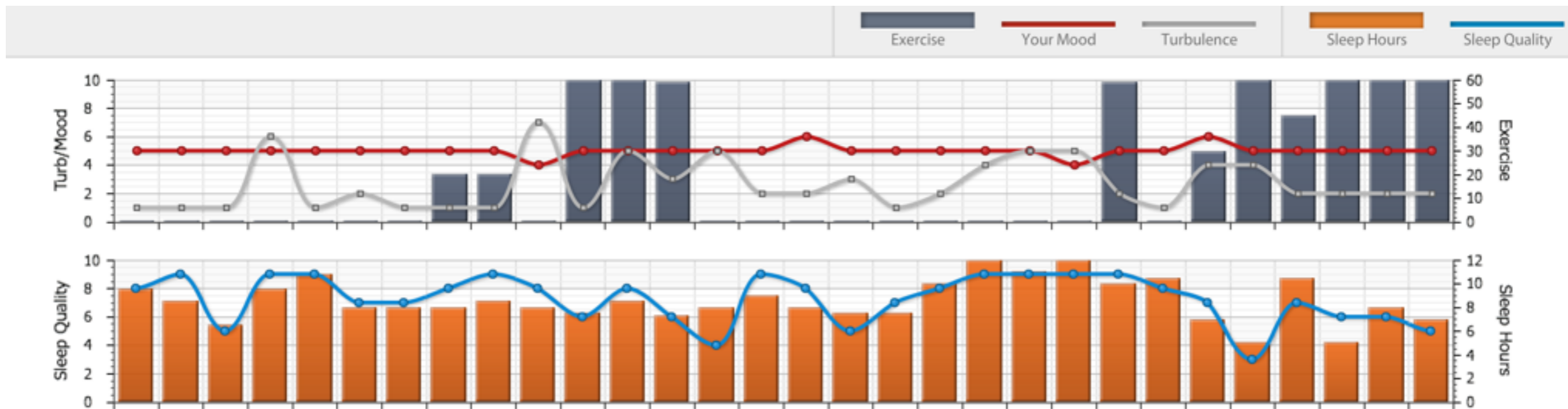
Symptoms

- | | | | | |
|---------------------------------------|---|---|---|--|
| <input type="checkbox"/> Irritability | <input type="checkbox"/> Feeling Guilty | <input type="checkbox"/> Insufficient Sleep | <input type="checkbox"/> Suicidal Thoughts | <input type="checkbox"/> Loss of Libido |
| <input type="checkbox"/> Anger | <input type="checkbox"/> Feeling Hopelessness | <input type="checkbox"/> Excessive Sleep | <input type="checkbox"/> Poor Concentration | <input type="checkbox"/> Behind with Housew... |
| <input type="checkbox"/> Sadness | <input type="checkbox"/> Feeling Worthless | <input type="checkbox"/> Loss of Energy | <input type="checkbox"/> Relating Poorly | |
| <input type="checkbox"/> Anxiety | <input type="checkbox"/> Negative Self Talk | <input type="checkbox"/> Loss of Interest | <input type="checkbox"/> Change of Appetite | |

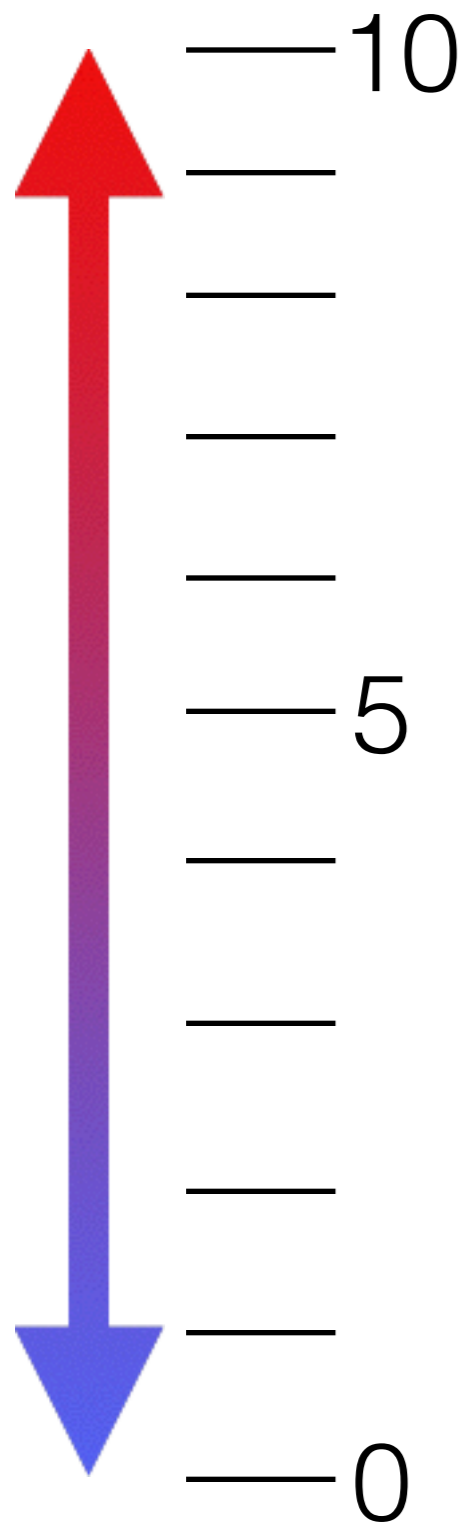
Basic Variables

Rate Your Mood Today 1 2 3 4 5 6 7 8 9 10 Very Depressed Very Elevated	Rate the Quality of Your Sleep 1 2 3 4 5 6 7 8 9 10 Very Poor Great Sleep	How Long Did You Exercise Today? 0 10 20 30 40 50 60+ Minutes
Emotional Turbulence level 1 2 3 4 5 6 7 8 9 10 Constant Mood High Variability	How Many Hours Did You Sleep? <input type="text"/>	Did You Take Your Medications? <input type="radio"/> Yes <input type="radio"/> No <input checked="" type="radio"/> N/A

In-app Plotting



Mood



5: Baseline mood

4: Bad day, negative attitude

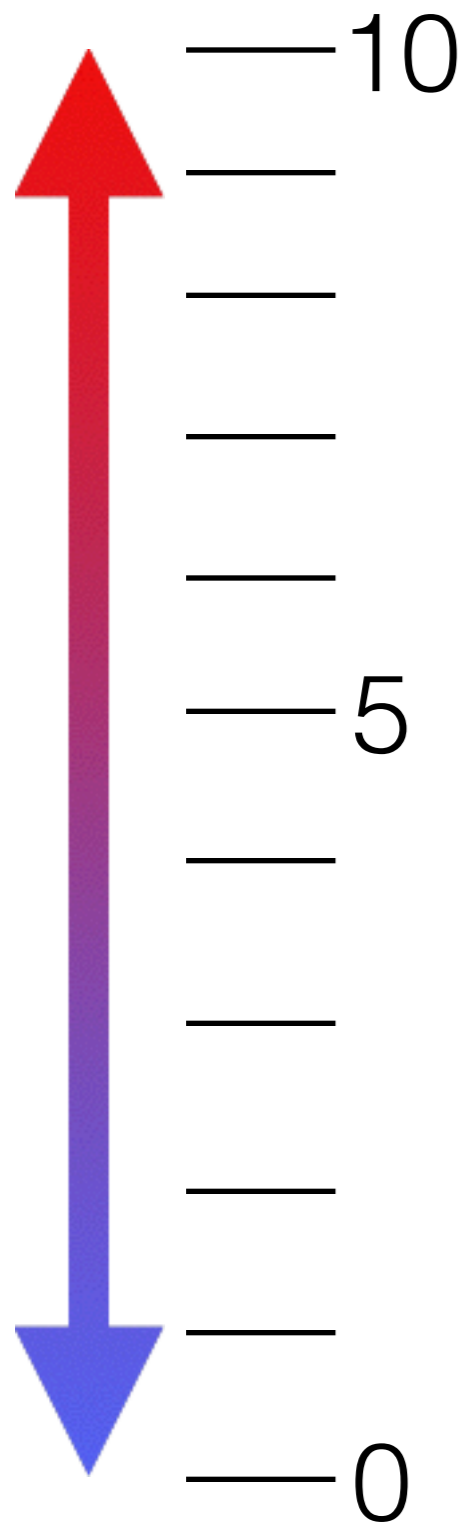
3: Constant negativity, slow thinking
Feelings of worthlessness

2: Difficulty accomplishing daily tasks
suicidal thoughts, highly self critical

1: Unable to function, constant thoughts
of suicide, possible plan, no hope

0: Catatonic, enacting plan of suicide

Mood



5: Baseline mood

4: Bad day, negative attitude

3: Constant negativity, slow thinking
Feelings of worthlessness

2: Difficulty accomplishing daily tasks
suicidal thoughts, highly self critical

1: Unable to function, constant thoughts
of suicide, possible plan, no hope

0: Catatonic, enacting plan of suicide

Mood



10: Unbearable mental anguish, incapacitated

9: Unable to focus, use physical pain to distract, unable to rest

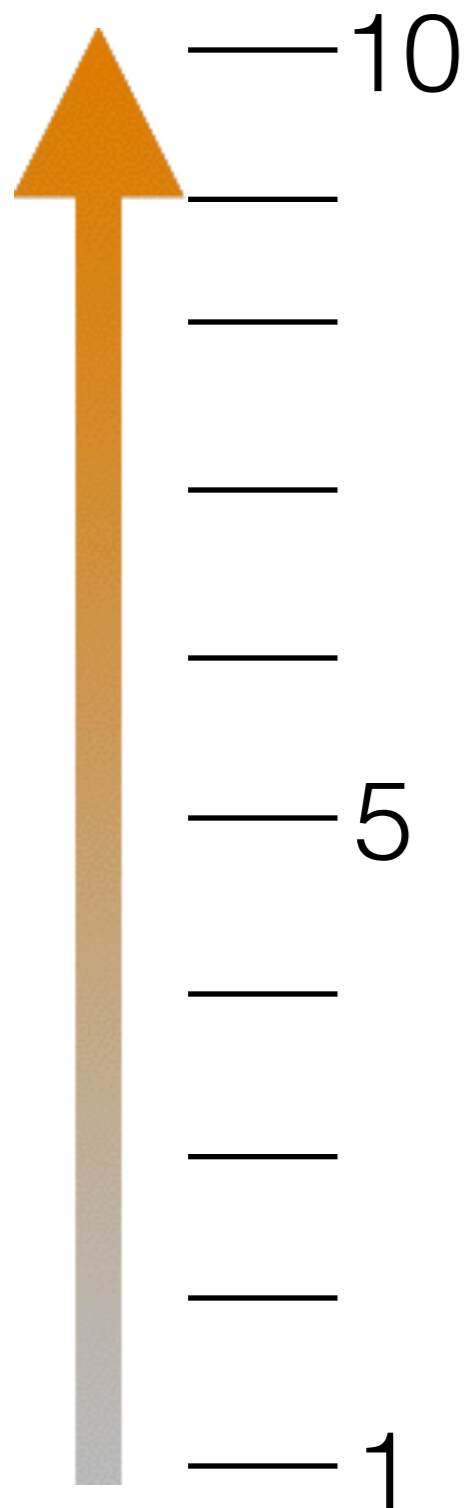
8: Buzzing, mind too fast for body, can be angry and irritable

7: Rapid speech, feeling unstoppable, expansive, highly elevated

6: Great day, very positive, high confidence

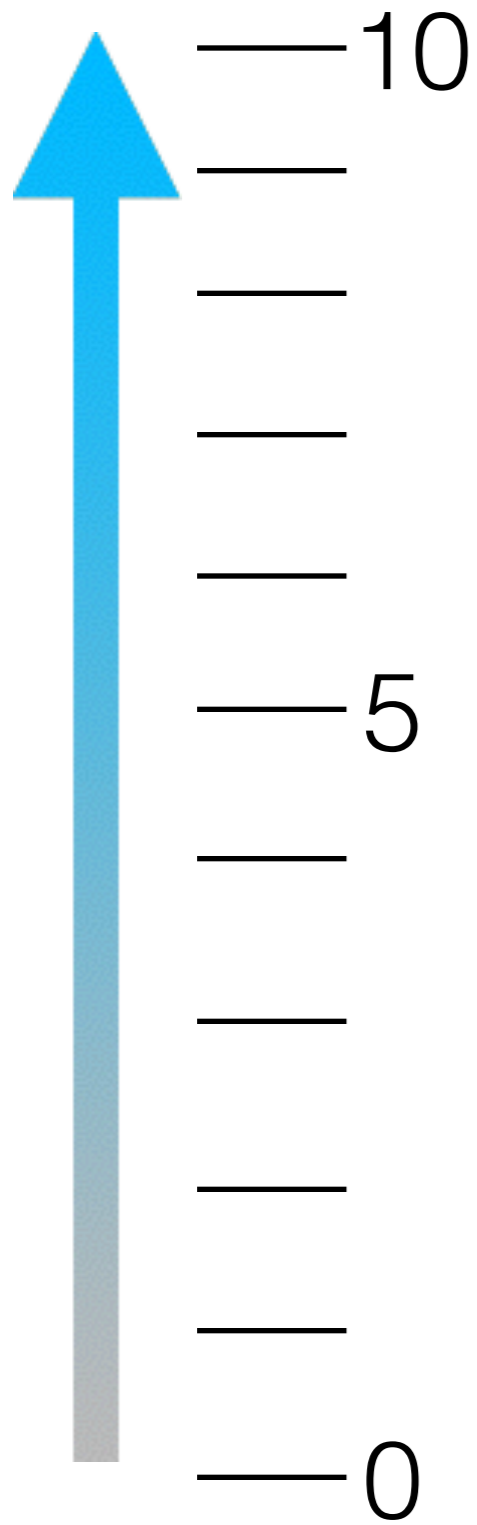
5: Baseline mood

Turbulence

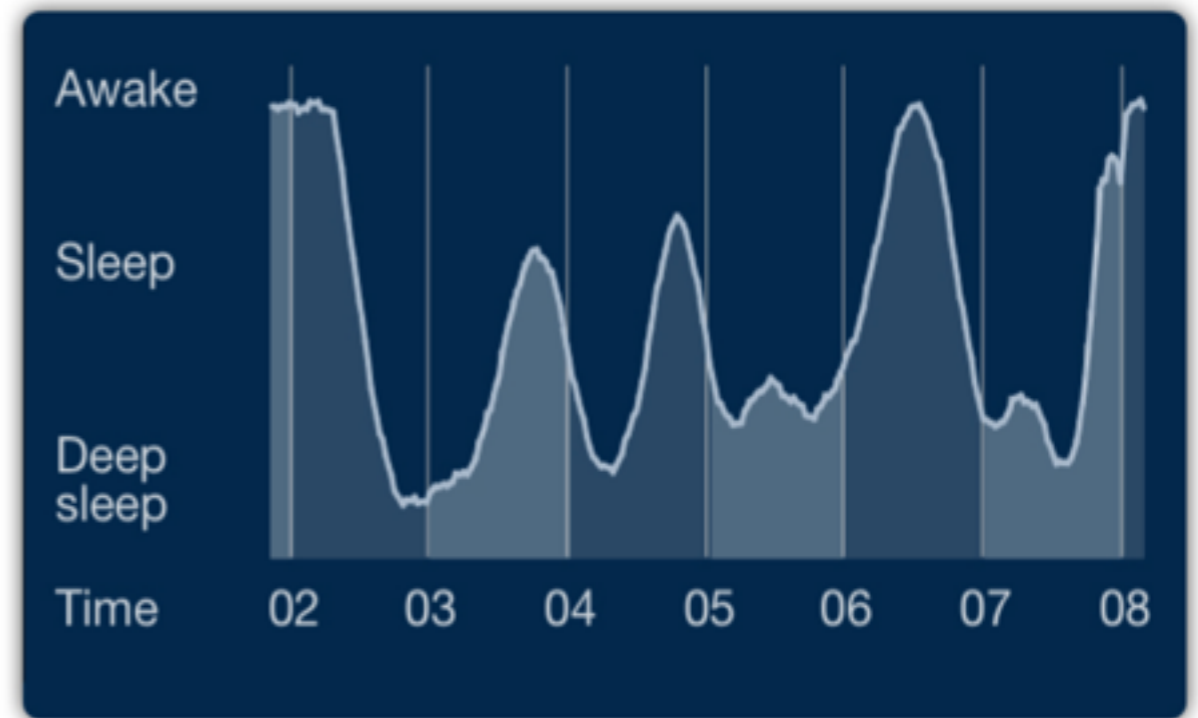


- 10: Constantly cycling mood, difficult to function, disorientation
- 6-9: fluctuation between extreme mood states or rapid-fire change between similar states
- 5: Cycling begins to interfere with daily life
- 2-4: Generally corresponds to normal daily fluctuations in mood
- 1: Constant mood

Sleep



Sleep Cycle



Did You Take Your Medications?

Yes No N/A

Triggers

- | | |
|--|--|
| <input type="checkbox"/> Hospital/Indisposed | <input type="checkbox"/> Alcohol Consumption |
| <input checked="" type="checkbox"/> Stress Level | <input type="checkbox"/> Black Out |
| <input type="checkbox"/> Change in Treatment | <input type="checkbox"/> Sexual Contact |
| <input checked="" type="checkbox"/> Caffeine Consumption | <input checked="" type="checkbox"/> Ill-health or Pain |

Symptoms

- ▶ Agitation
- ▶ Irritability
- ▶ Anger
- ▶ Racing thoughts
- ▶ Racing Speech
- ▶ Hyperkinesia
- ▶ Energized
- ▶ Euphoria
- ▶ Fatigue
- ▶ Exuastion
- ▶ Anxiety
- ▶ Food Anxiety

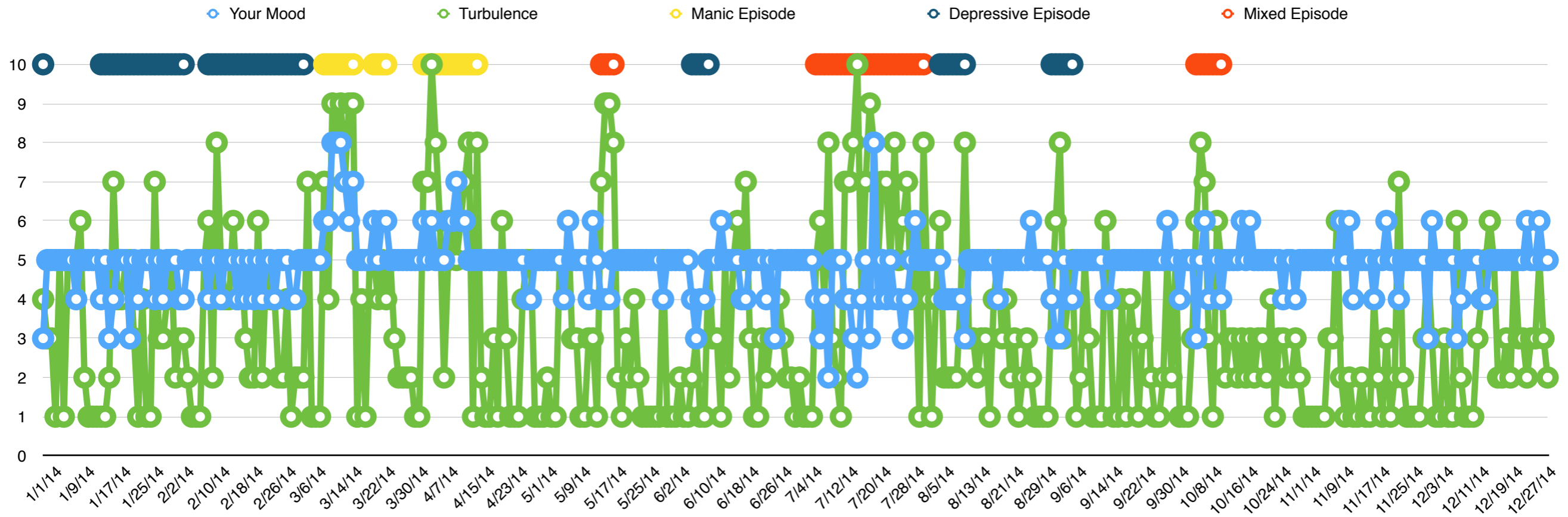
- ▶ Binge Behavior
- ▶ Panic Attack
- ▶ Dissociation
- ▶ Disorientation
- ▶ Poor Concentration
- ▶ Loss of Interest
- ▶ Feeling Hopelessness
- ▶ Feeling Worthless
- ▶ Sadness
- ▶ Unhappiness
- ▶ Slow Scale
- ▶ Suicidal Thoughts

2013



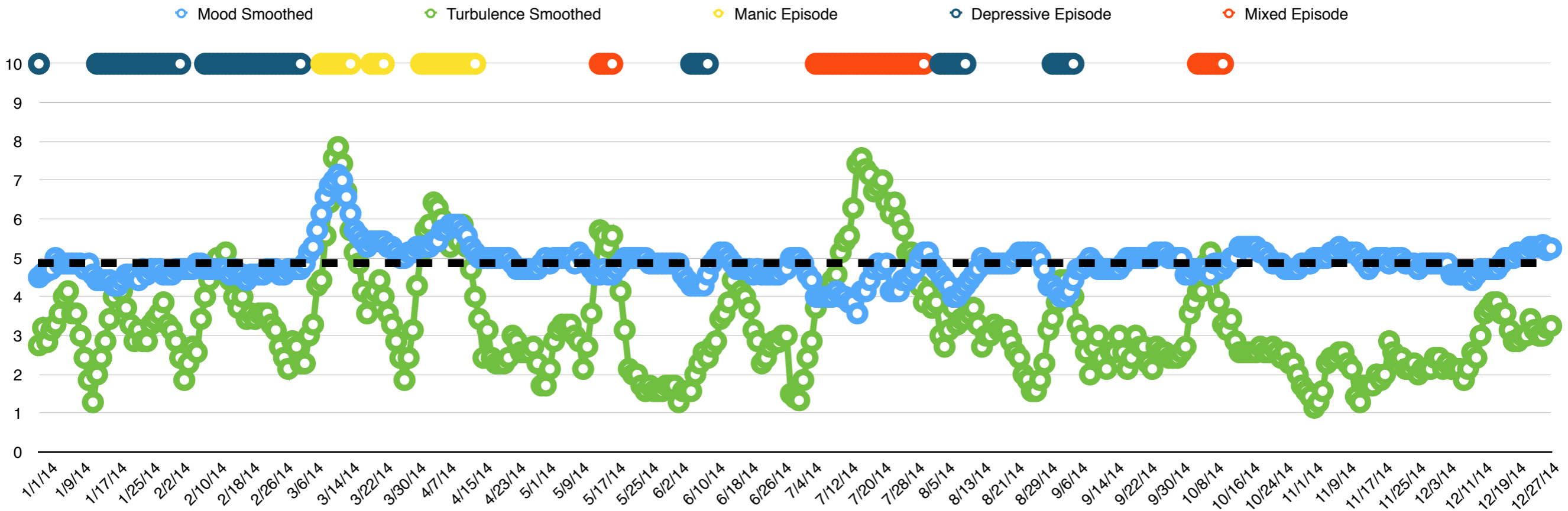
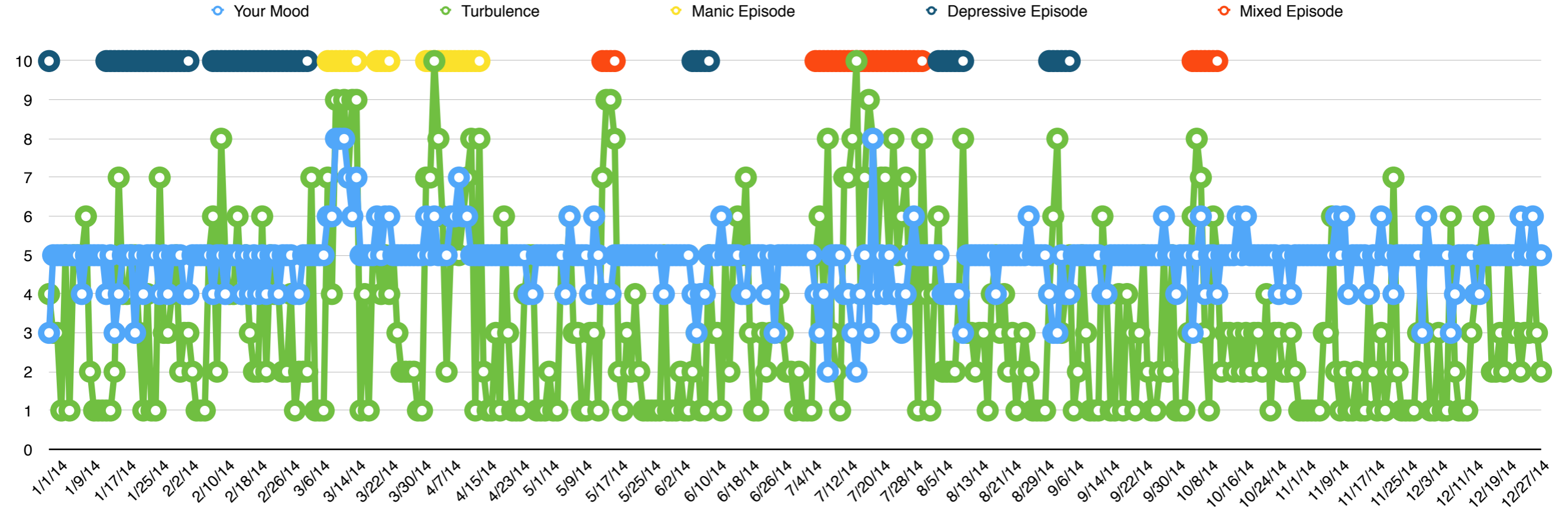
- Identify when I'm in an episode - HUGE - and how long it lasts
- Realize that I rapidly cycle
- Develop emotional discounting behaviors
- Motivated me to talk to others and build a support network

2014

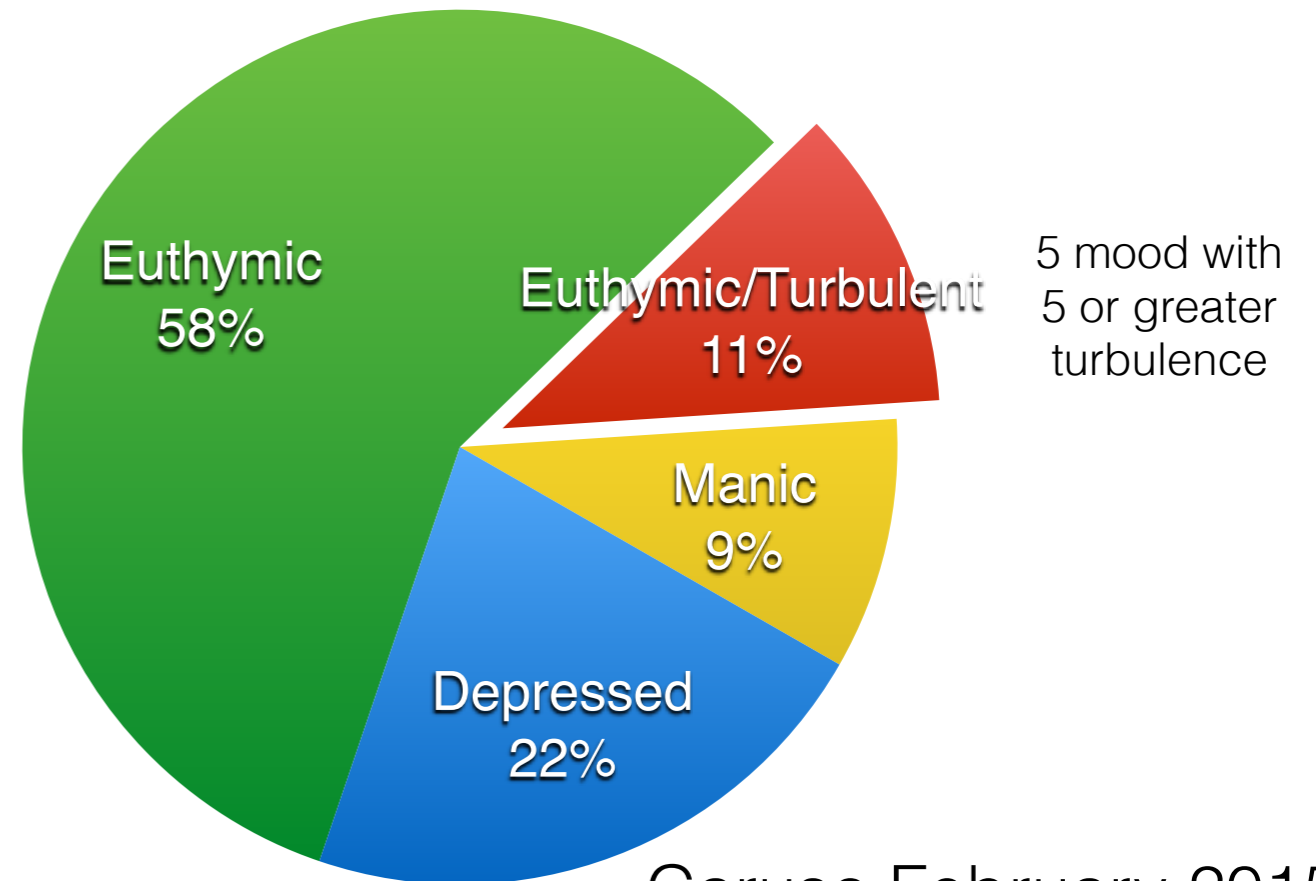
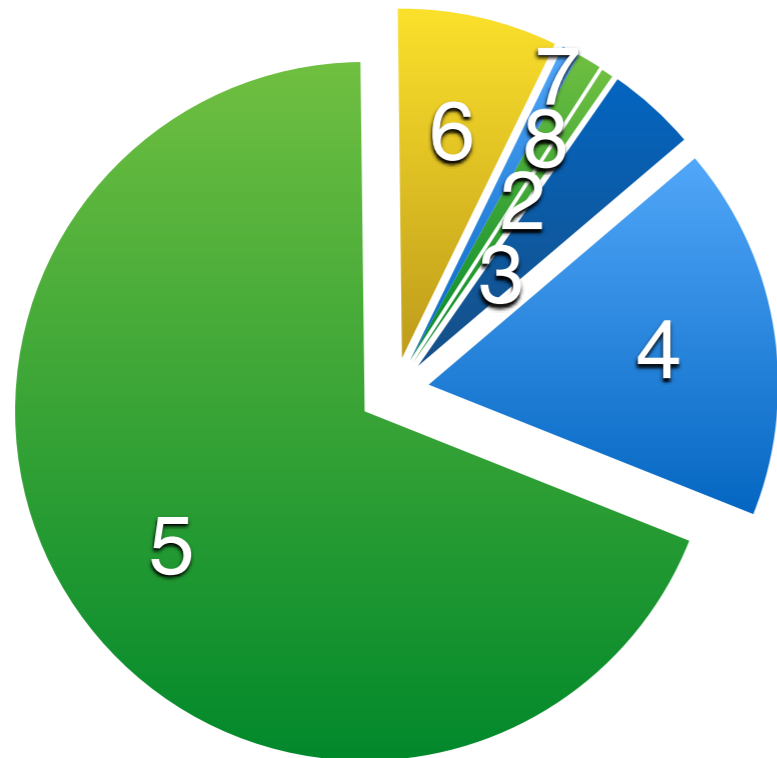
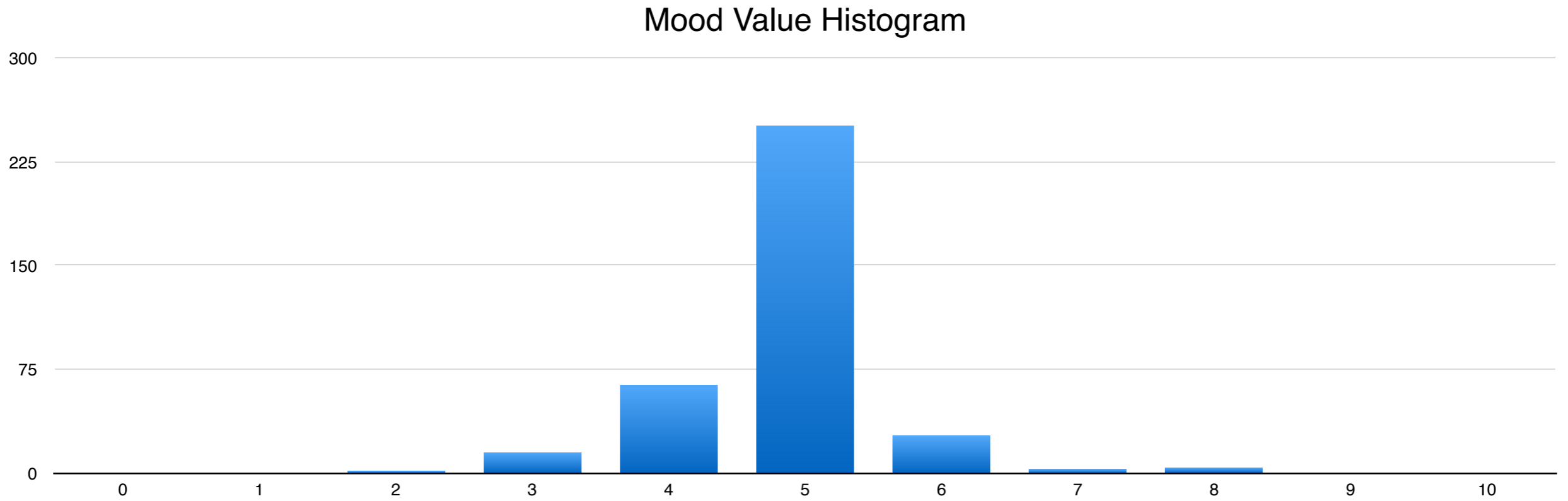


- Psychiatrist appointments became more collaborative
- Delved deeper into my recorded information to better understand my disorder
- Began using data to inform my treatment choices
- In-depth journaling to understand emotions and triggers

Michael Caruso 2014 Mood Analysis



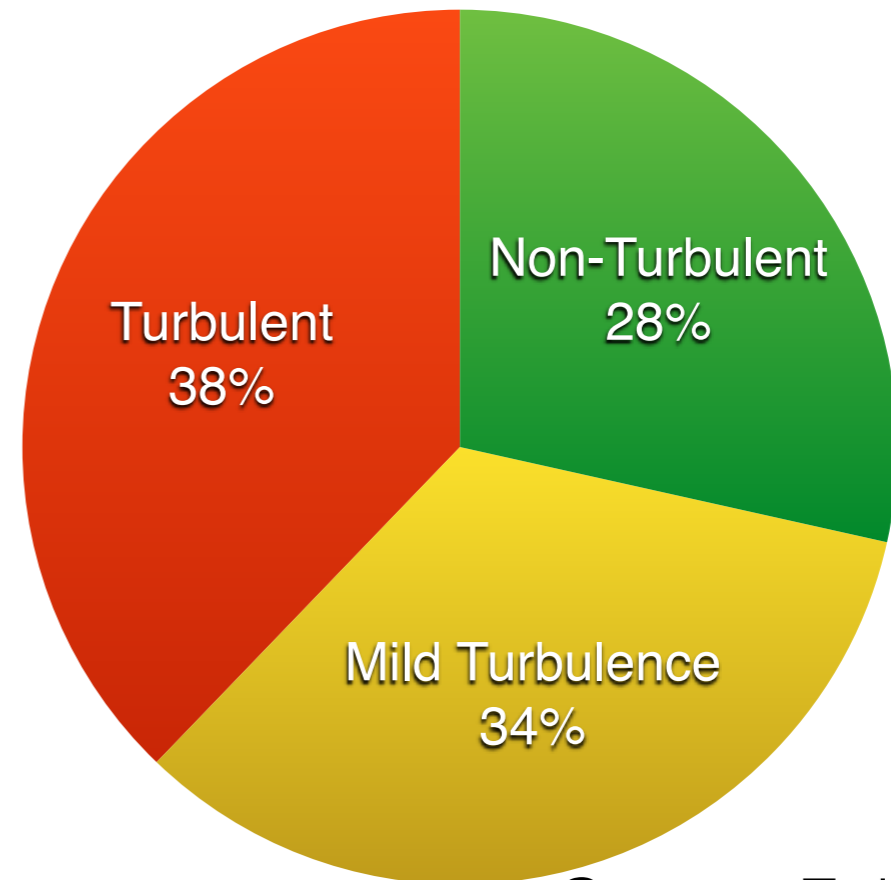
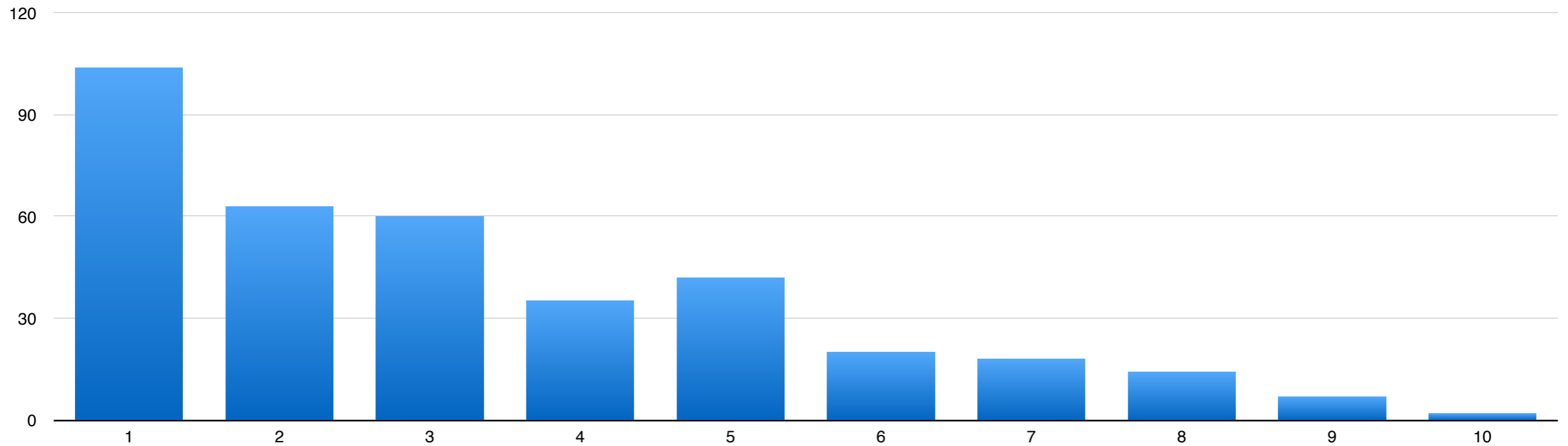
Michael Caruso 2014 Mood Analysis



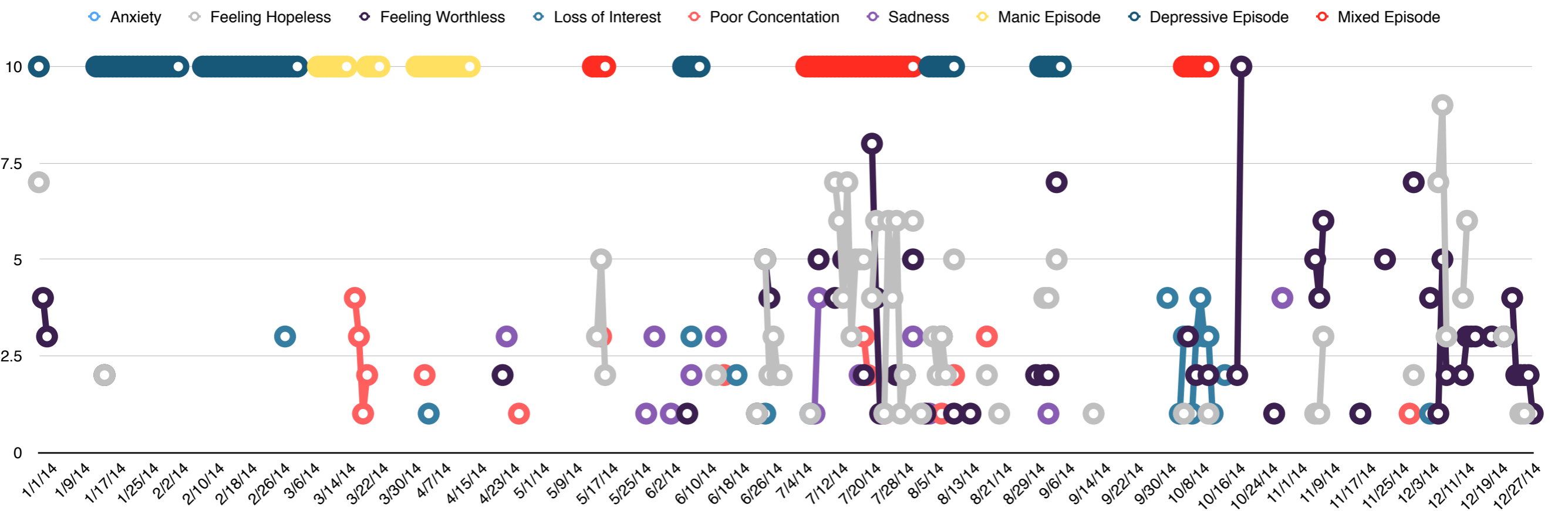
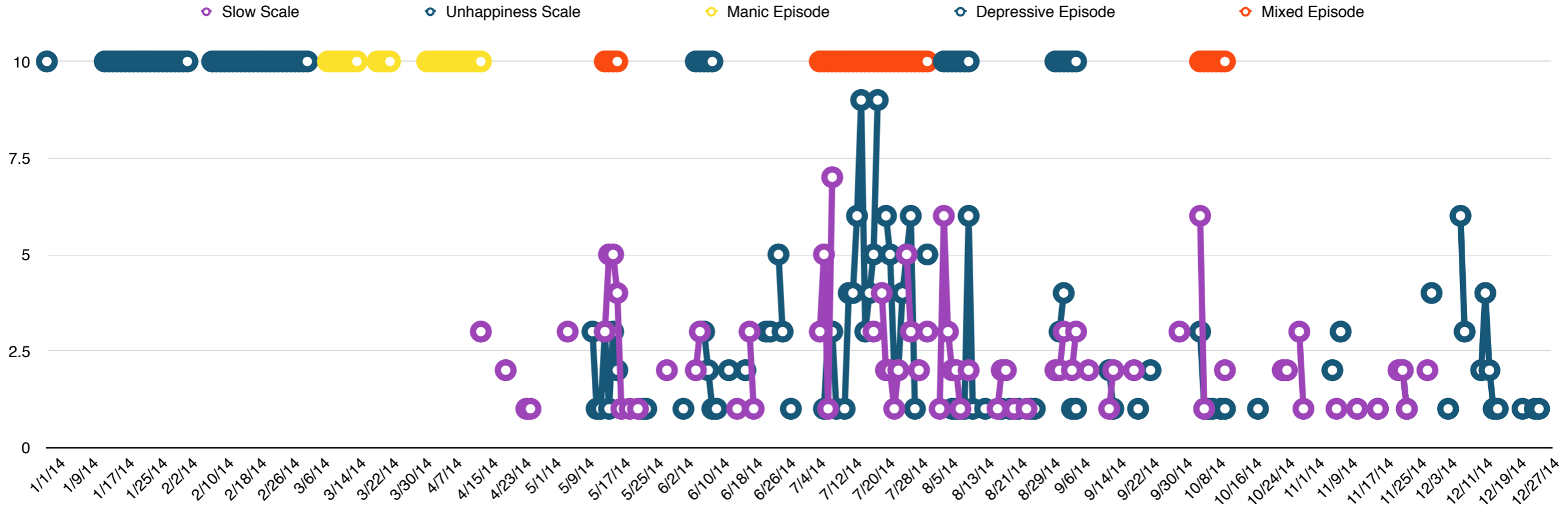
Caruso February 2015

Michael Caruso 2014 Mood Analysis

Turbulence Histogram

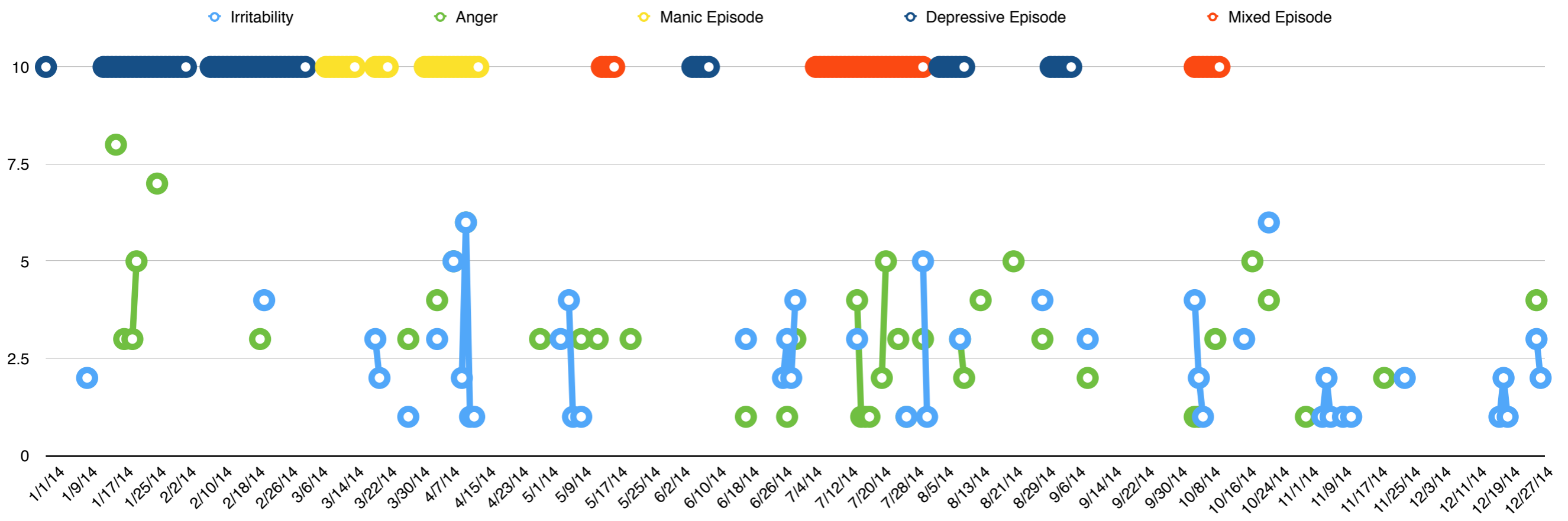
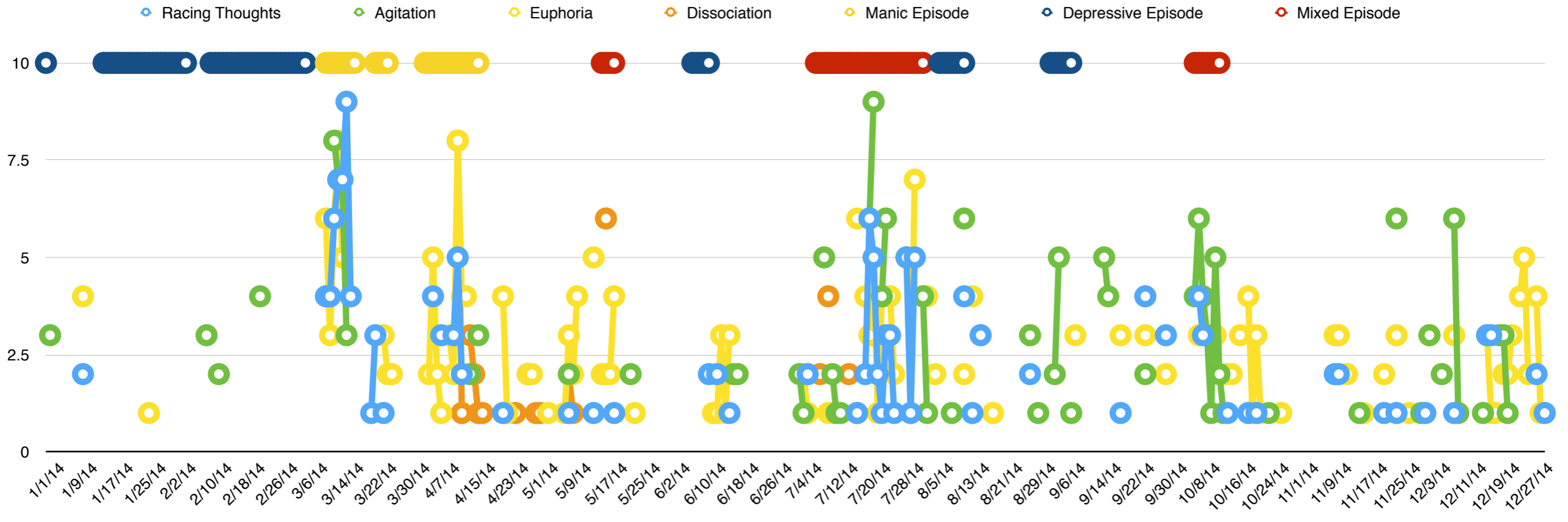


Michael Caruso 2014 Depression Markers



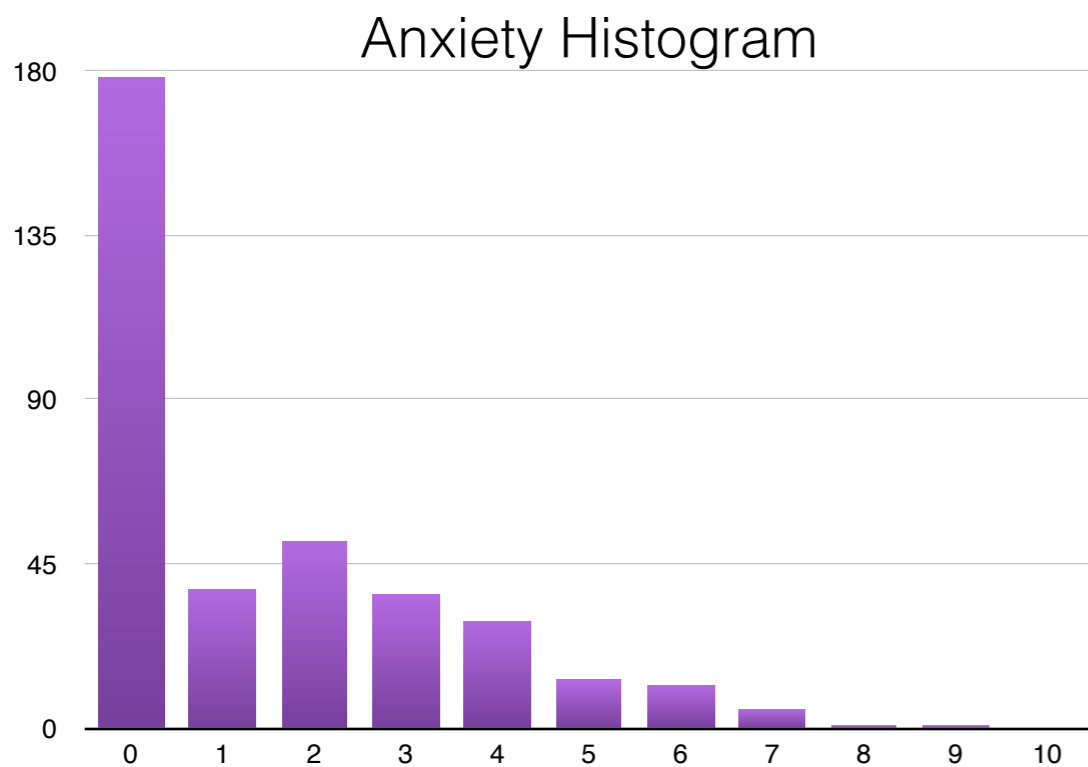
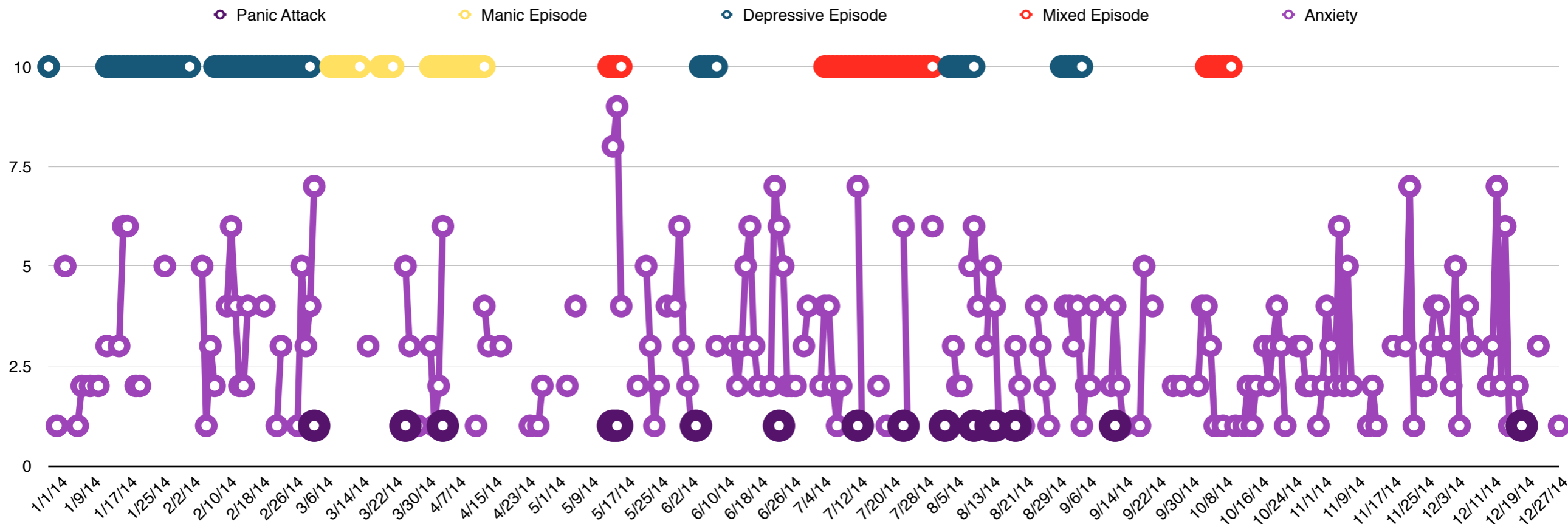
Caruso February 2015

Michael Caruso 2014 Manic Markers

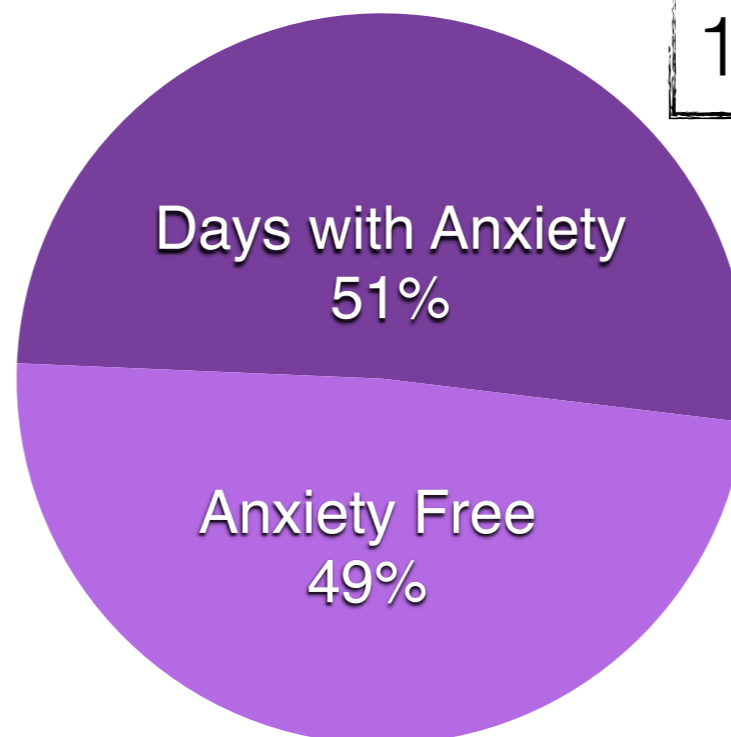


Caruso February 2015

Michael Caruso 2014 Anxiety



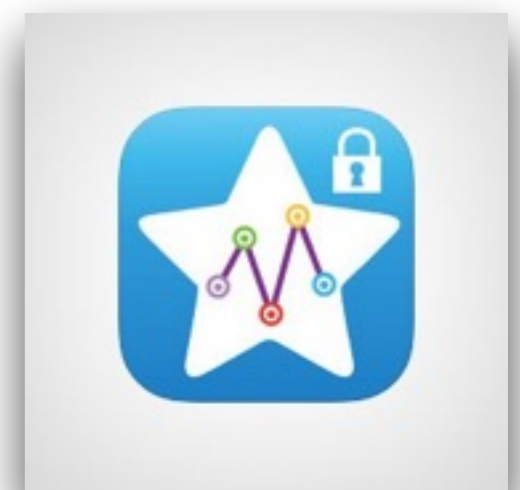
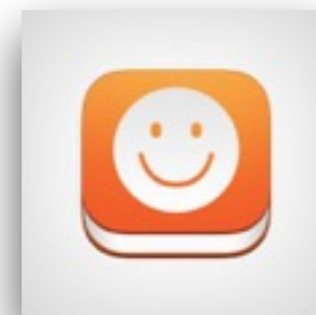
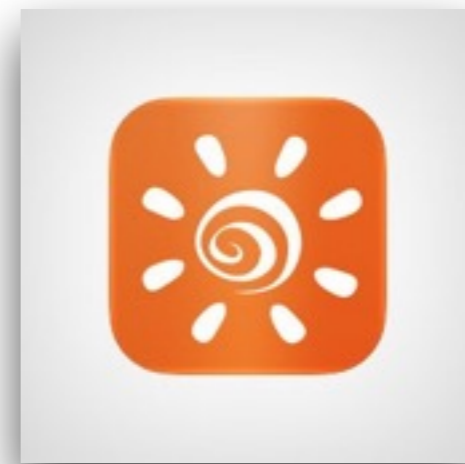
16 Anxiety Attacks



Dissecting an Episode in Real Time: March-May 2014

Why Track?

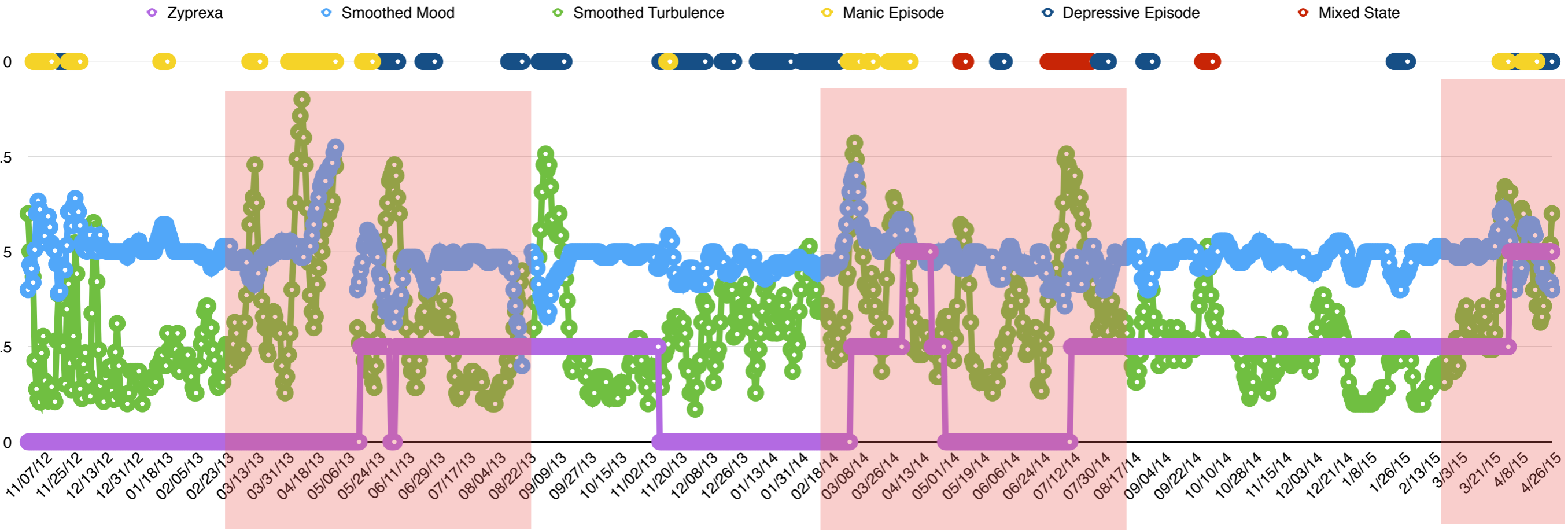
- Understand the interplay of emotions and behavior
- Identify early warning signs when episodes begin
- Gain deeper insight into triggers
- Better inform treatment



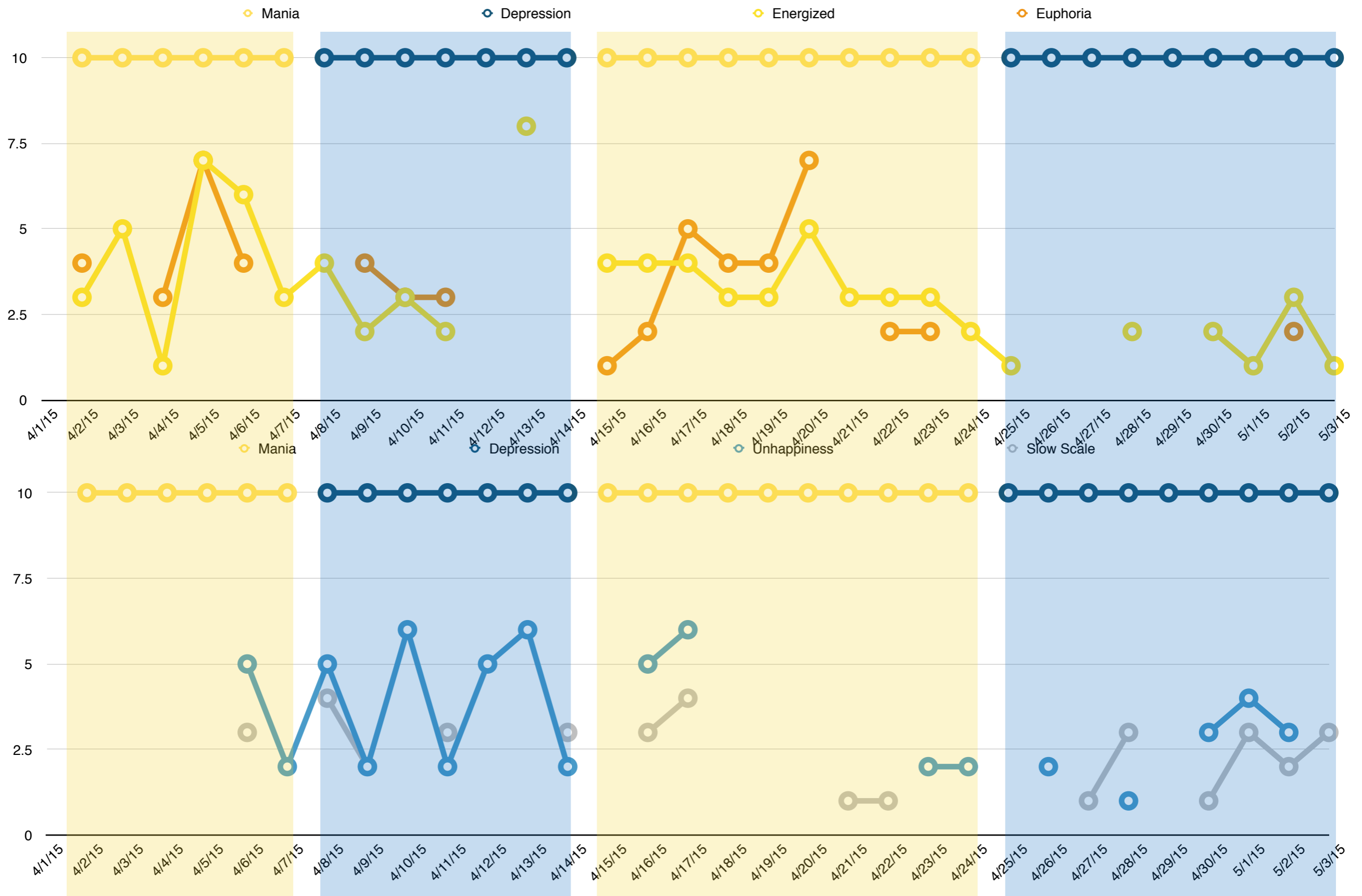
Thank You



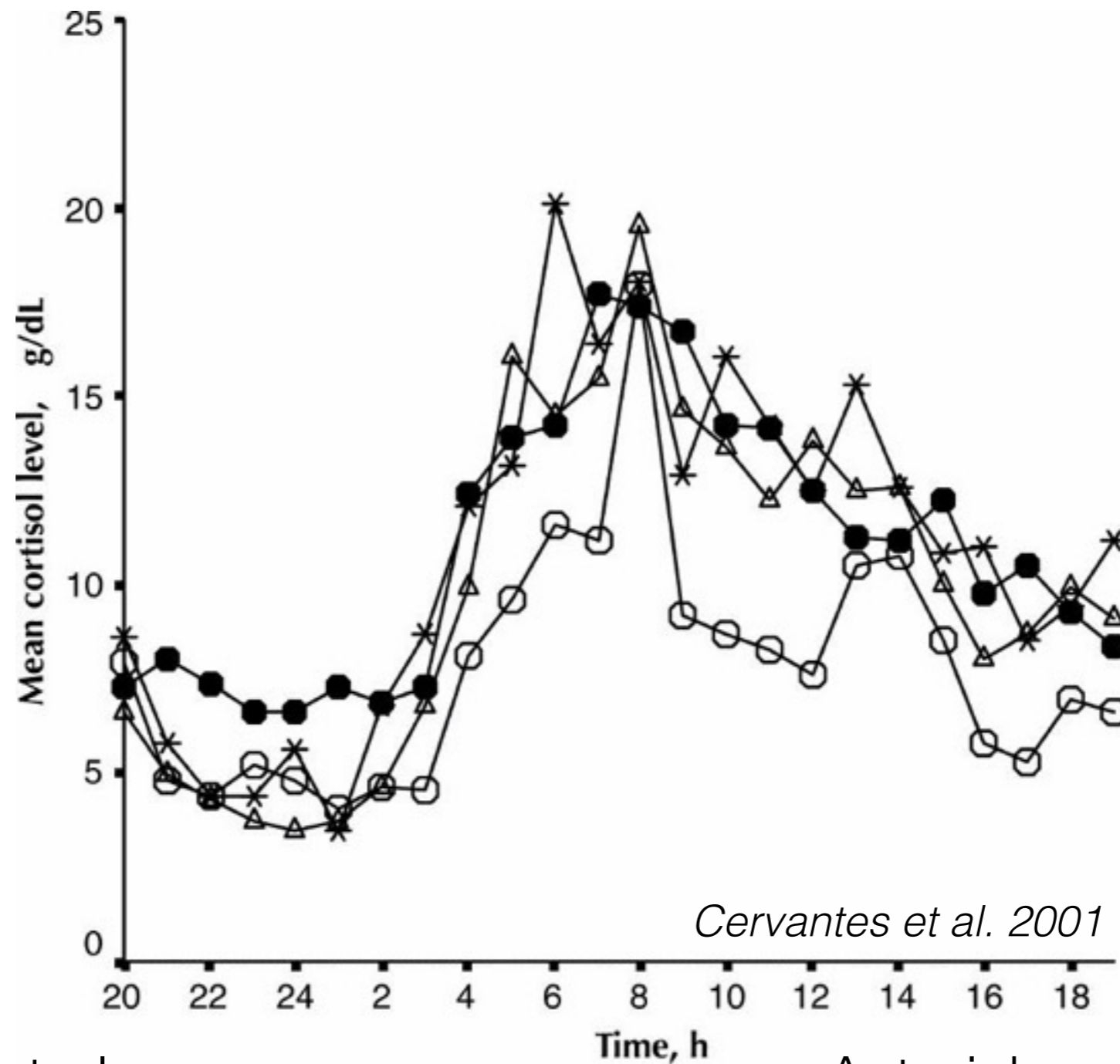
Use of Zyprexa over time



Recent Episode Analysis: Clustering



Pattern of Cortisol Elevation



Open Circle - Control
Black Circle - Bipolar Depressed

Asterisk - Hypomanic
Open Triangle - Euthymic