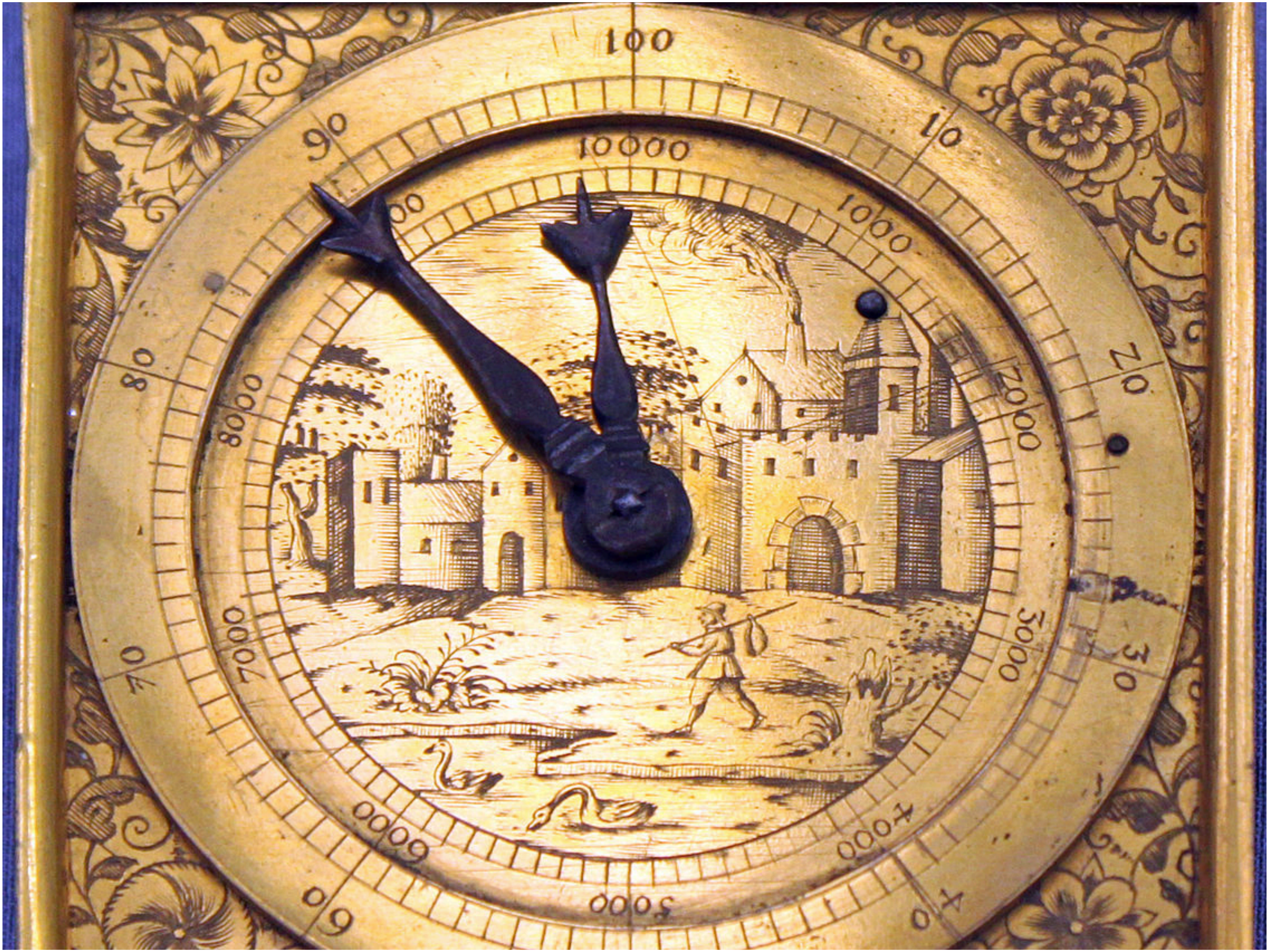
Designing to Help People Find Insights & Experiences in Personal Data

Sean Munson · smunson.com · @smunson

HUMAN CENTERED DESIGN & ENGINEERING
UNIVERSITY of WASHINGTON

DUB
DESIGN
USE
BUILD

SPL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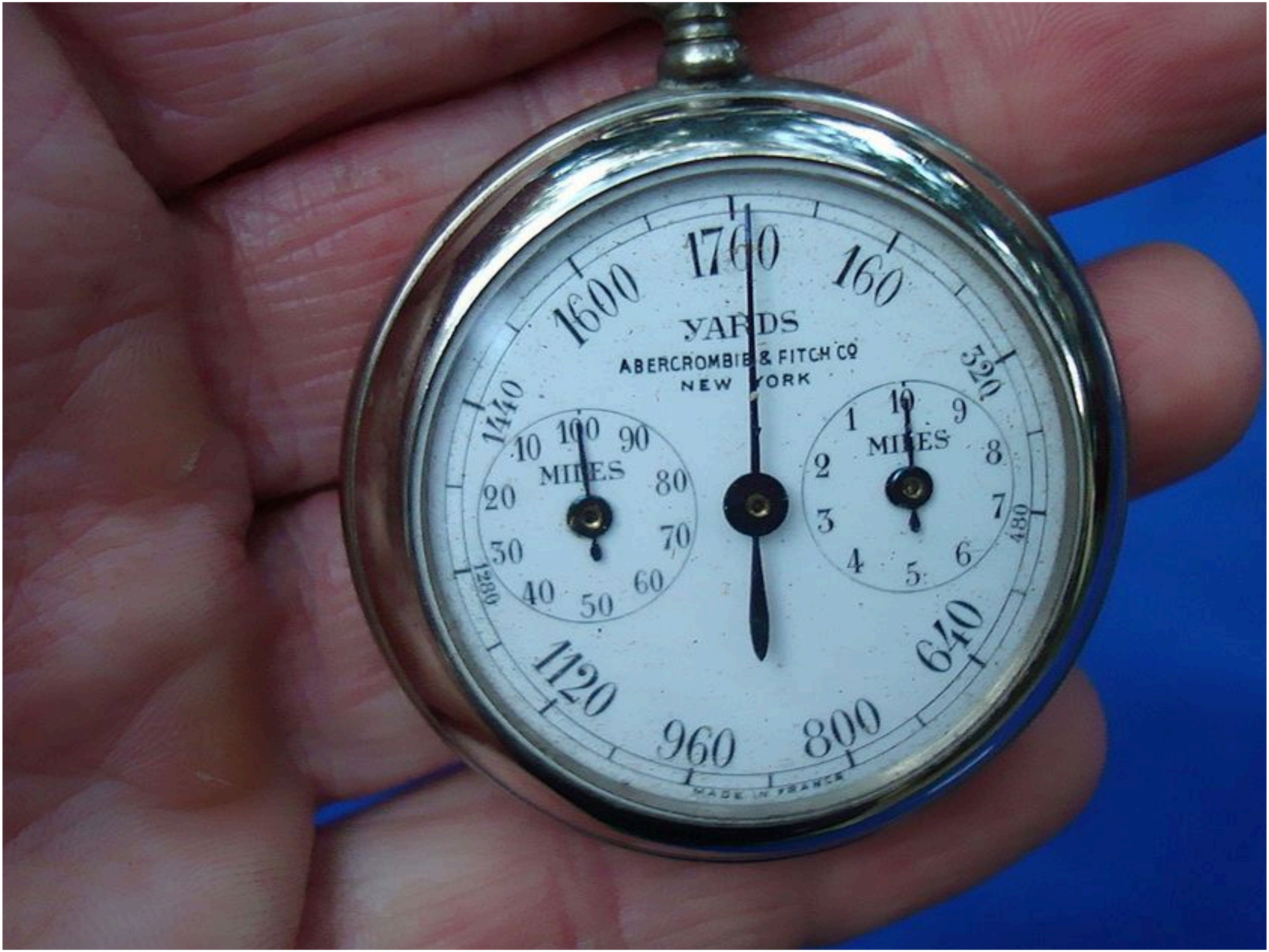
YARDS
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MILES
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9
MADE IN FRANCE

40 km
35
30
25
20
15
Walker
250 m
ESCHENBACH
70
80

Manpokei 万歩計

MANPO-METER
日本万歩クラブ推薦

交通巡査
11260歩＝6.7キロ(8時間)

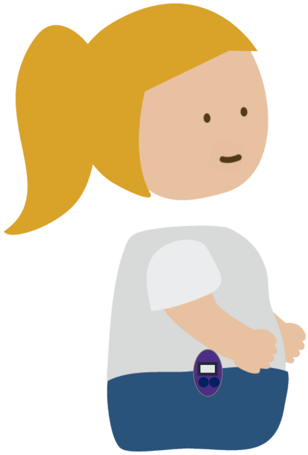
ビヤホールのウエートレス
12550歩＝5.5キロ(8時間)

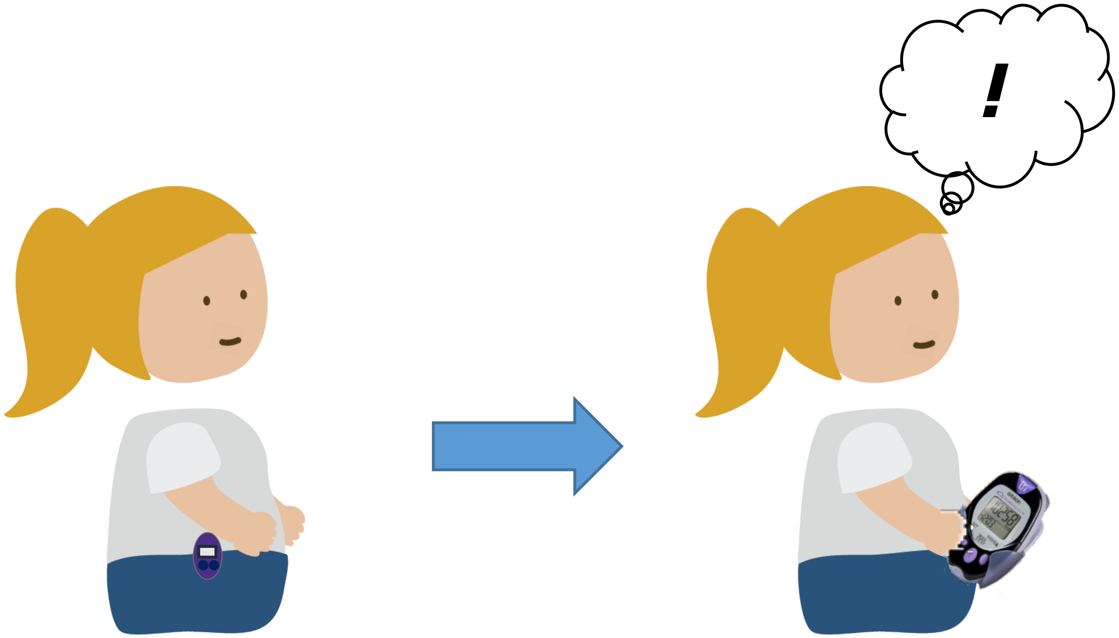
[redacted]さん（20）＝東京・有楽町のビヤホール客席は約五百　大体三十人前後でサービスに当る満員になれば　ちょっと立止る暇もない

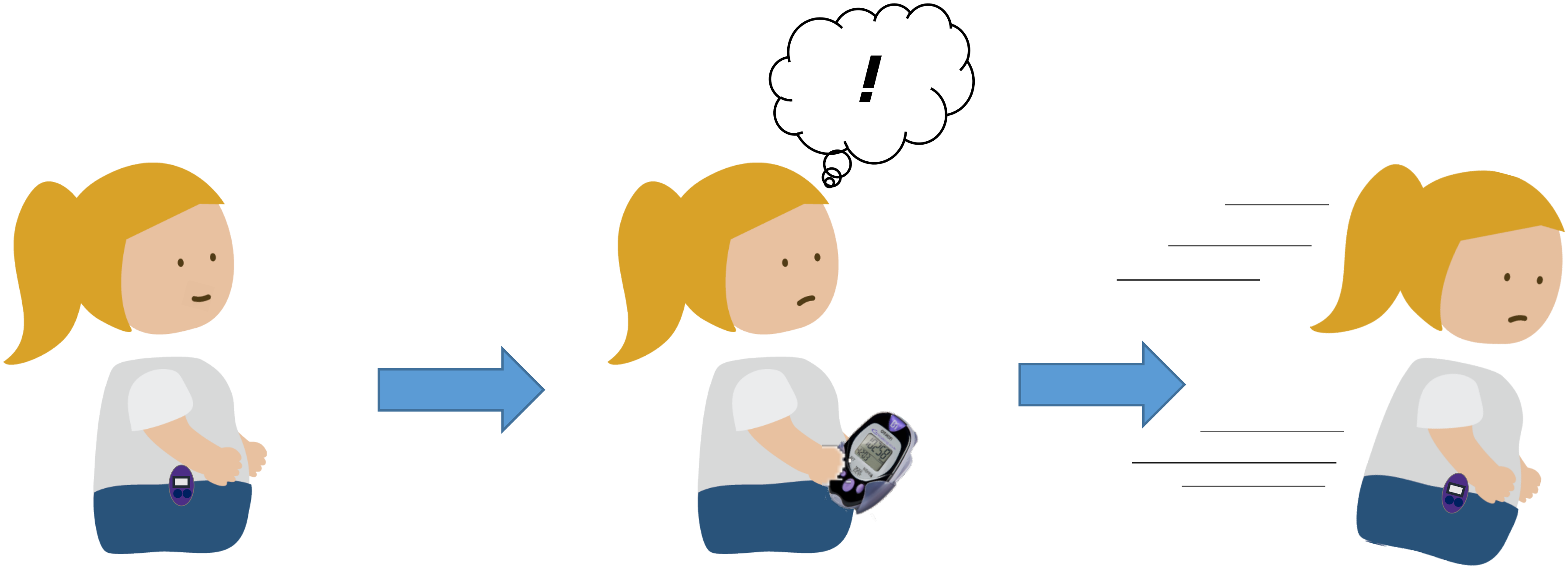
エアホステス
9000歩＝4.1キロ(6時間半)

[redacted]さん（22）＝東京――大阪の幹線を二往復　タバコや飲み物のサービスで機内を動き回る乗客は少なく楽だったという

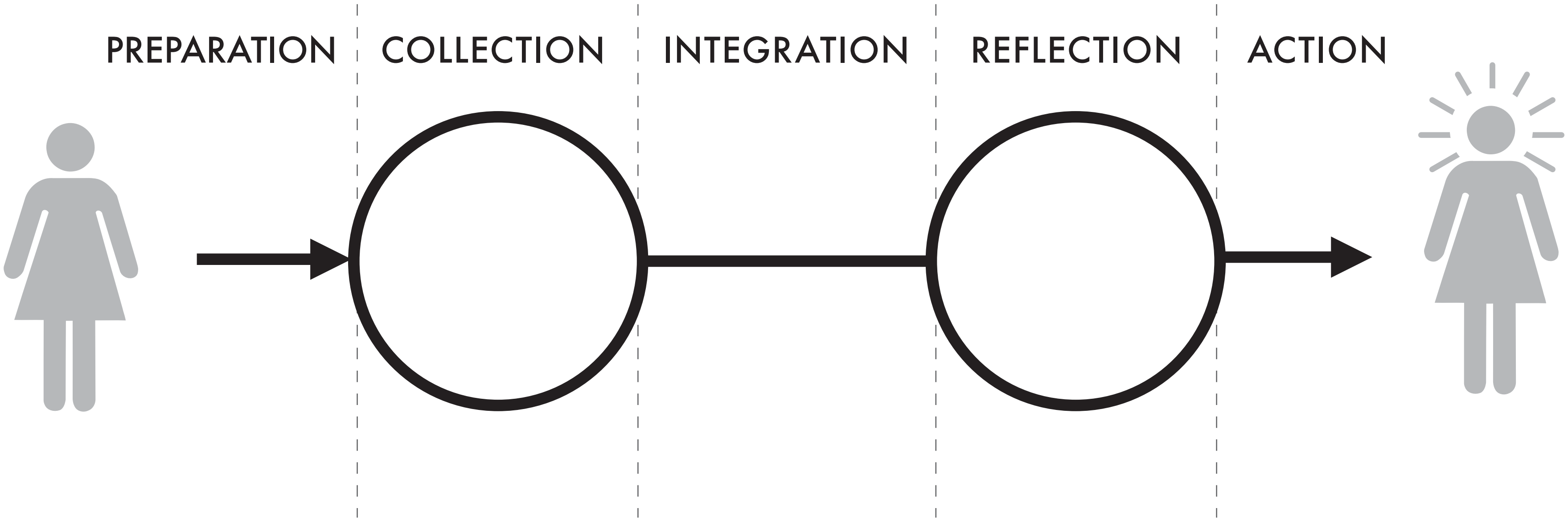
OMRON
Walking style
10258
Steps
PM 12:03
SET
MEMO/▲
MODE
EVENT







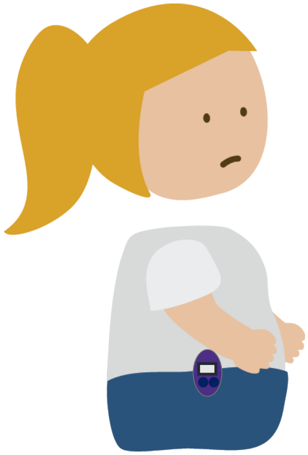
Five-Stage Model of Personal Informatics



PREPARATION COLLECTION INTEGRATION REFLECTION ACTION

Li I., Dey A., Forlizzi J. *CHI 2010.*
"A Stage-Based Model of Personal Informatics Systems"

Five-Stage Model of Personal Informatics



Alice

- 20 years old
- Has a family history of heart disease
- Wants to be more active
- Does not know how, because she is busy

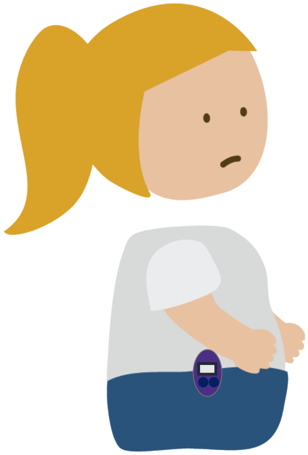
Li I., Dey A., Forlizzi J. *CHI 2010.*
"A Stage-Based Model of Personal Informatics Systems"

Preparation

OMRON
Walking style
10258
steps
12:03
RESET
MEMORY/▲
SET
MODE
FUEL

Li I., Dey A., Forlizzi J. *CHI 2010.*
"A Stage-Based Model of Personal Informatics Systems"

Preparation



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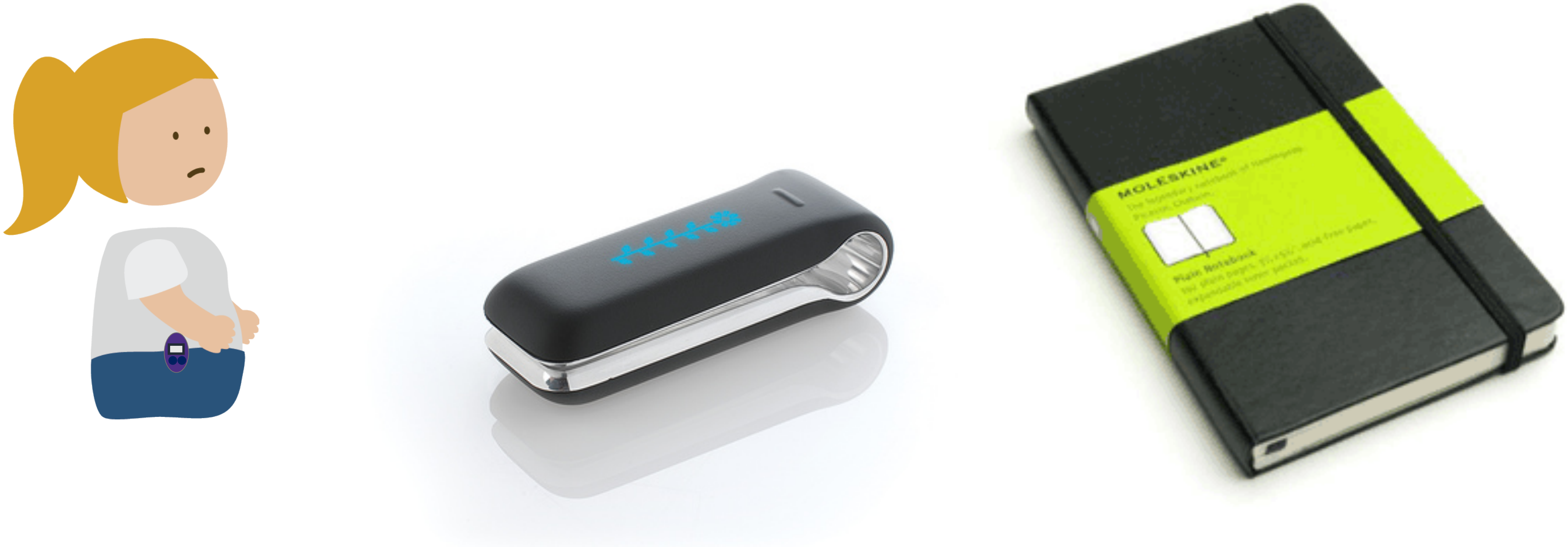
Preparation



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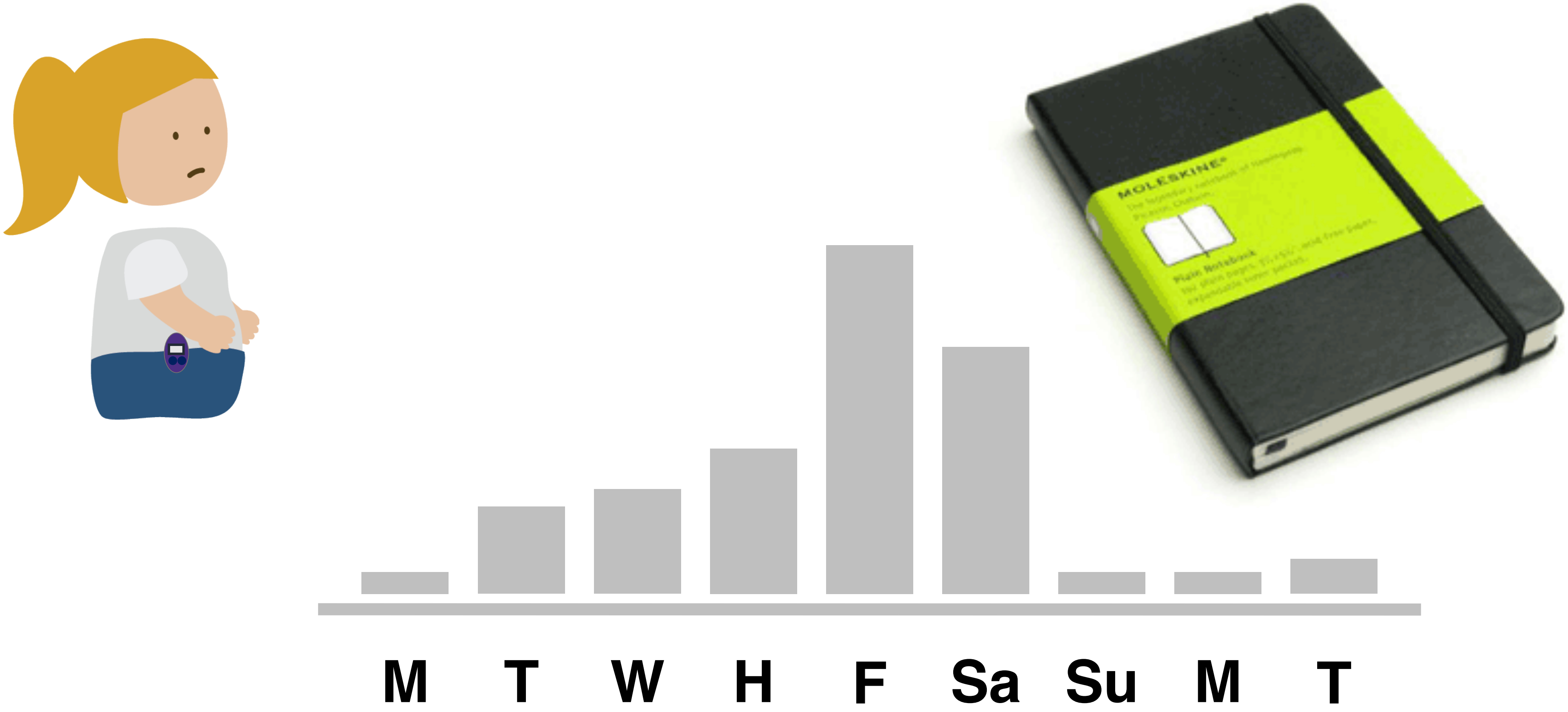
Integration


MOLESKINE
M
T
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Li I., Dey A., Forlizzi J. *CHI 2010.*
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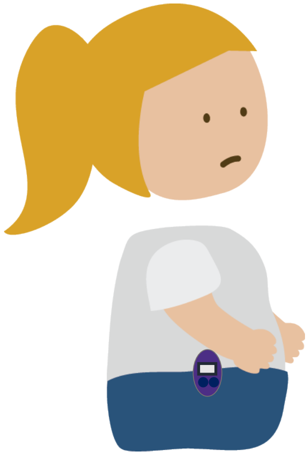
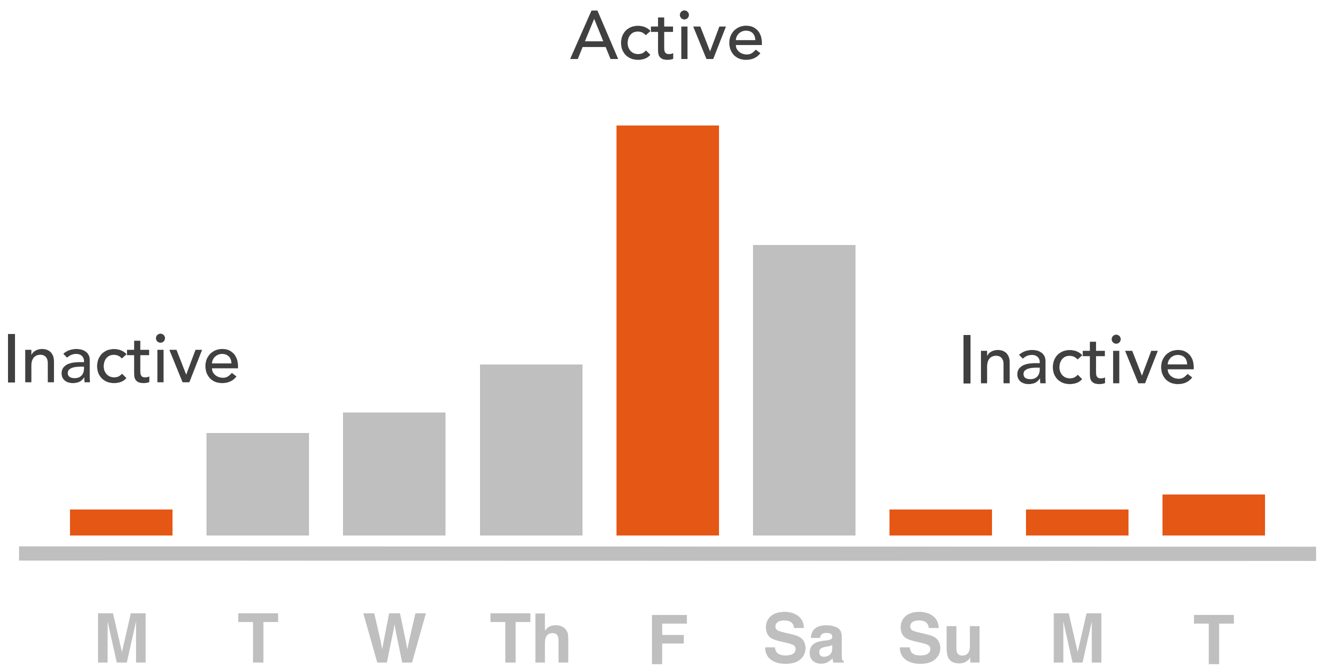
Reflection





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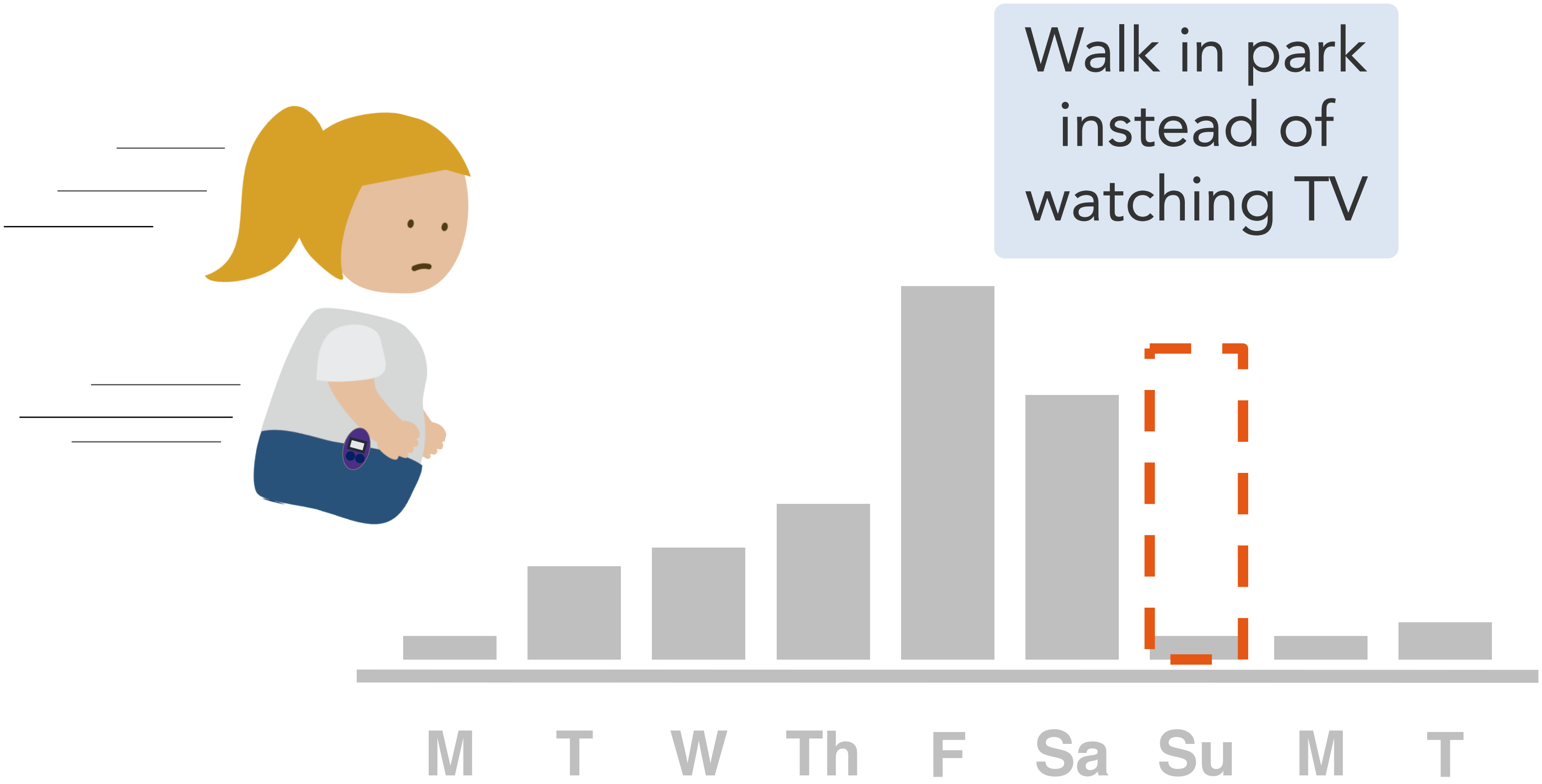
Action



Walk in park instead of watching TV

M
T
W
Th
F
Sa
Su
M
T

Li I., Dey A., Forlizzi J. *CHI 2010.*
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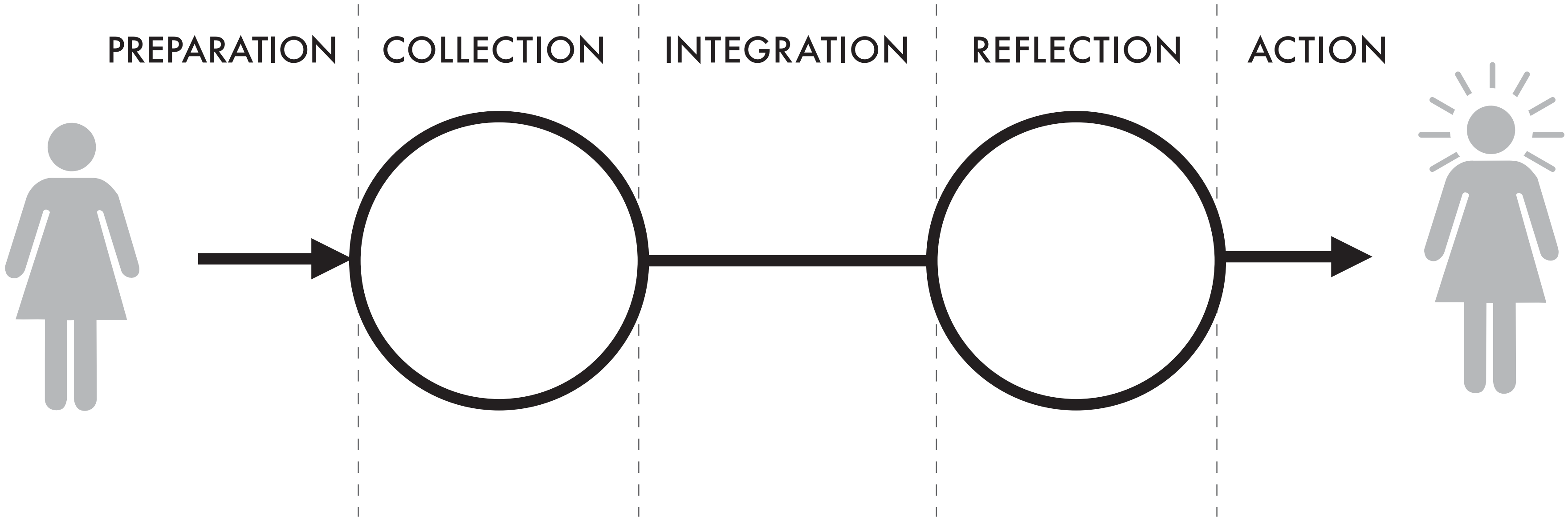
Five-Stage Model of Personal Informatics



PREPARATION COLLECTION INTEGRATION REFLECTION ACTION

Li I., Dey A., Forlizzi J. *CHI 2010.*
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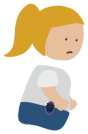
There are many
assumptions in this model.

Assumption #1

Action is the goal.

Goals

1. Get actionable insights



Epstein DA, Ping A, Fogarty J, Munson SA. *UbiComp* 2015.
A Lived Informatics Model of Personal Informatics.

Rooksby J, Rost M, Morrison A, Chalmers MC. *CHI* 2014.
Personal tracking as Lived Informatics

Goals

1. Get actionable insights
2. Satisfy curiosity

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4. Participate socially

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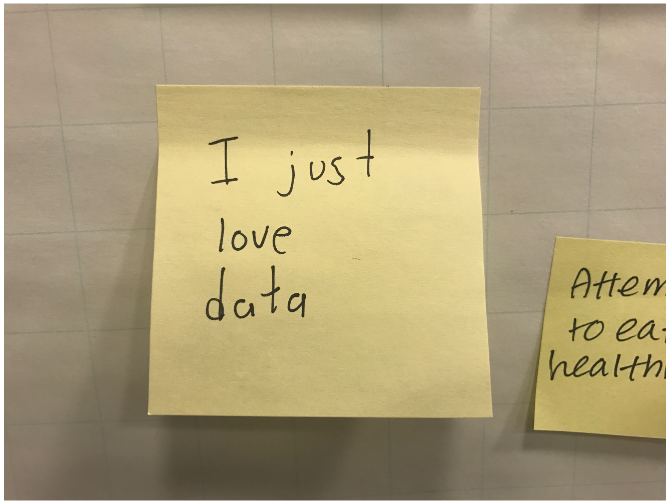

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1. Get actionable insights
2. Satisfy curiosity
3. Have a record
4. Participate socially
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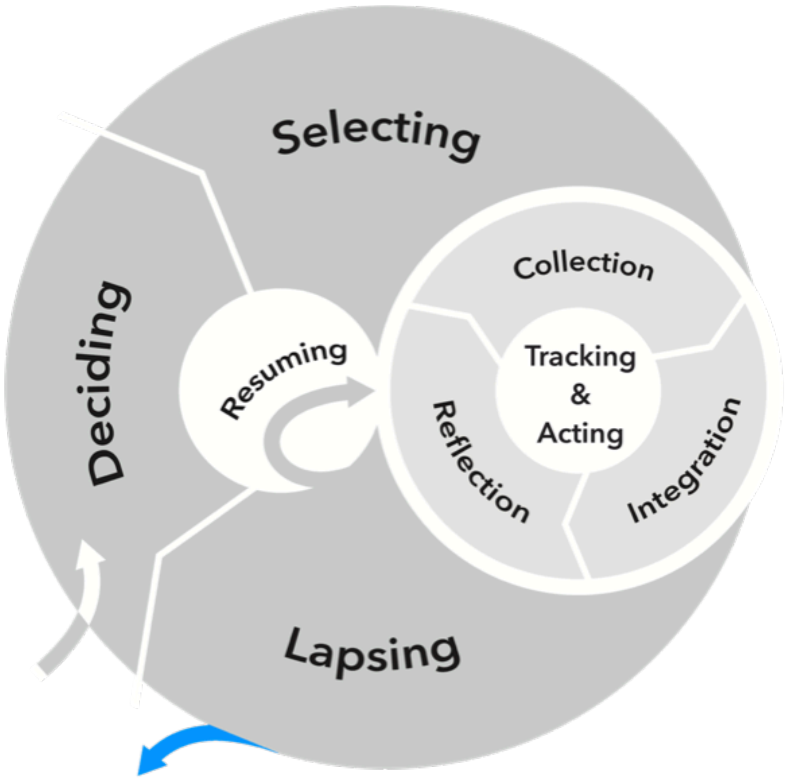
6. Fetishized Tracking

Need to design for varied goals.

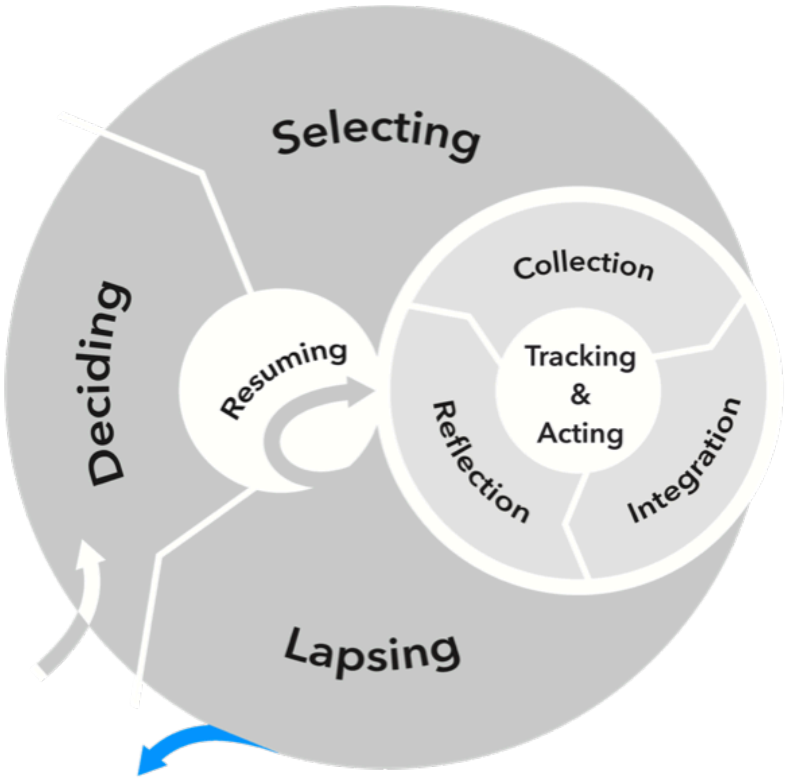
Assumption #2

People will use personal informatics tools indefinitely.


Selecting
Deciding
Resuming
Collection
Tracking
&
Acting
Reflection
Integration
Lapsing

Self-tracking tools have high rates of abandonment and lapsing.

⅓ of people abandon wearable trackers with 6-months, ½ within a year.


Selecting
Deciding
Resuming
Collection
Tracking
&
Acting
Reflection
Integration
Lapsing

Common reasons people lapse

1. Tracking is high burden – for collecting the data, for being confronted by one's data, or just *having* the data
2. They meet their goals or satisfy their curiosity
3. They don't get the benefits they wanted

Need to design for lapsing and restarting. This includes switching tools without losing data.

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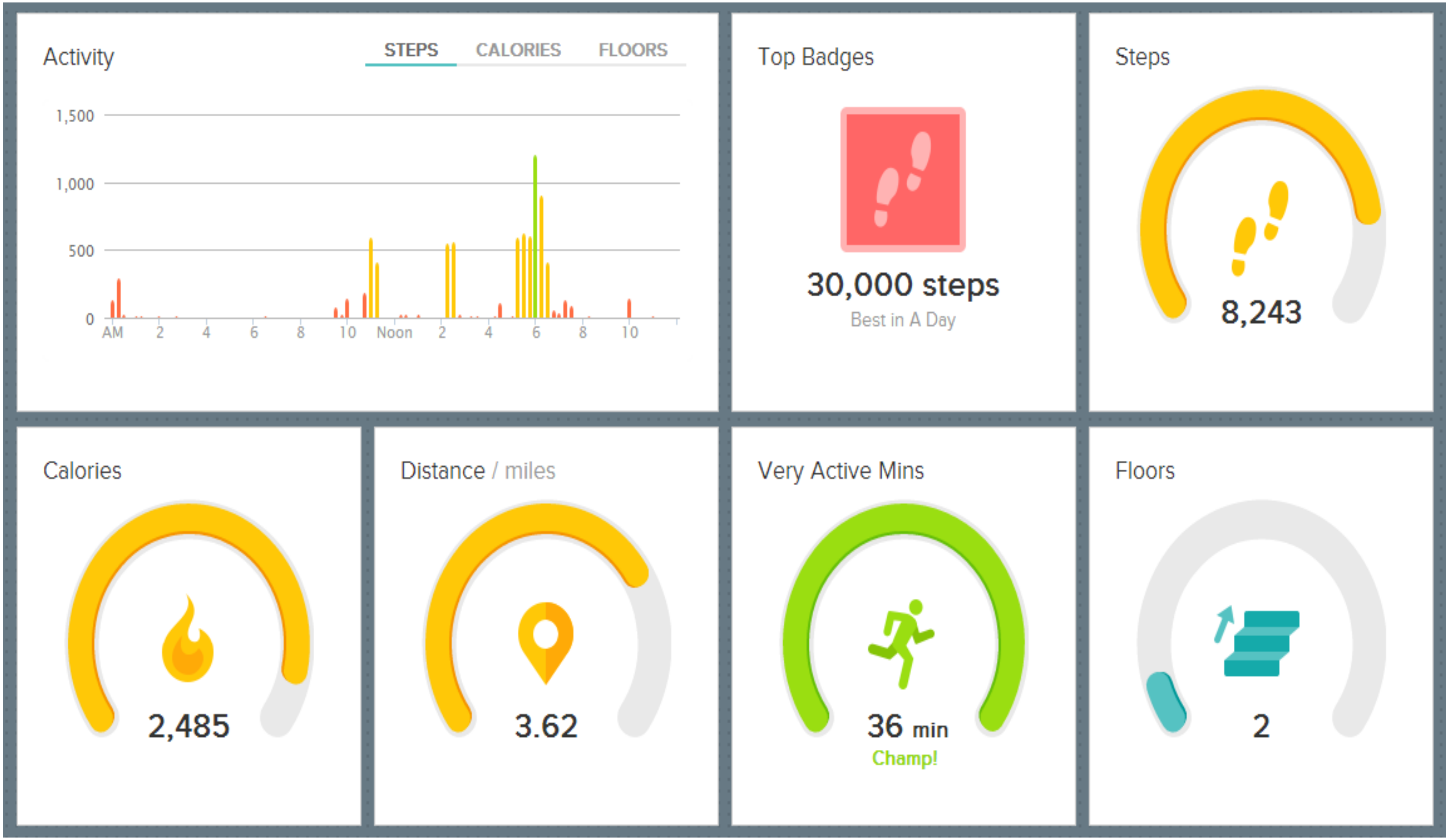
Not all abandonment or lapses are bad!

Assumption #3

Self monitoring and self regulation, maybe with a little social pressure, are enough to support behavior change.

2.34
1753
12680
fitbit
fitbit
fitbit


STEPS
CALORIES
FLOORS
1,500
1,000
500
0
AM
2
4
6
8
10
Noon
2
4
6
8
10

Activity

Top Badges

30,000 steps
Best in A Day

Steps
8,243

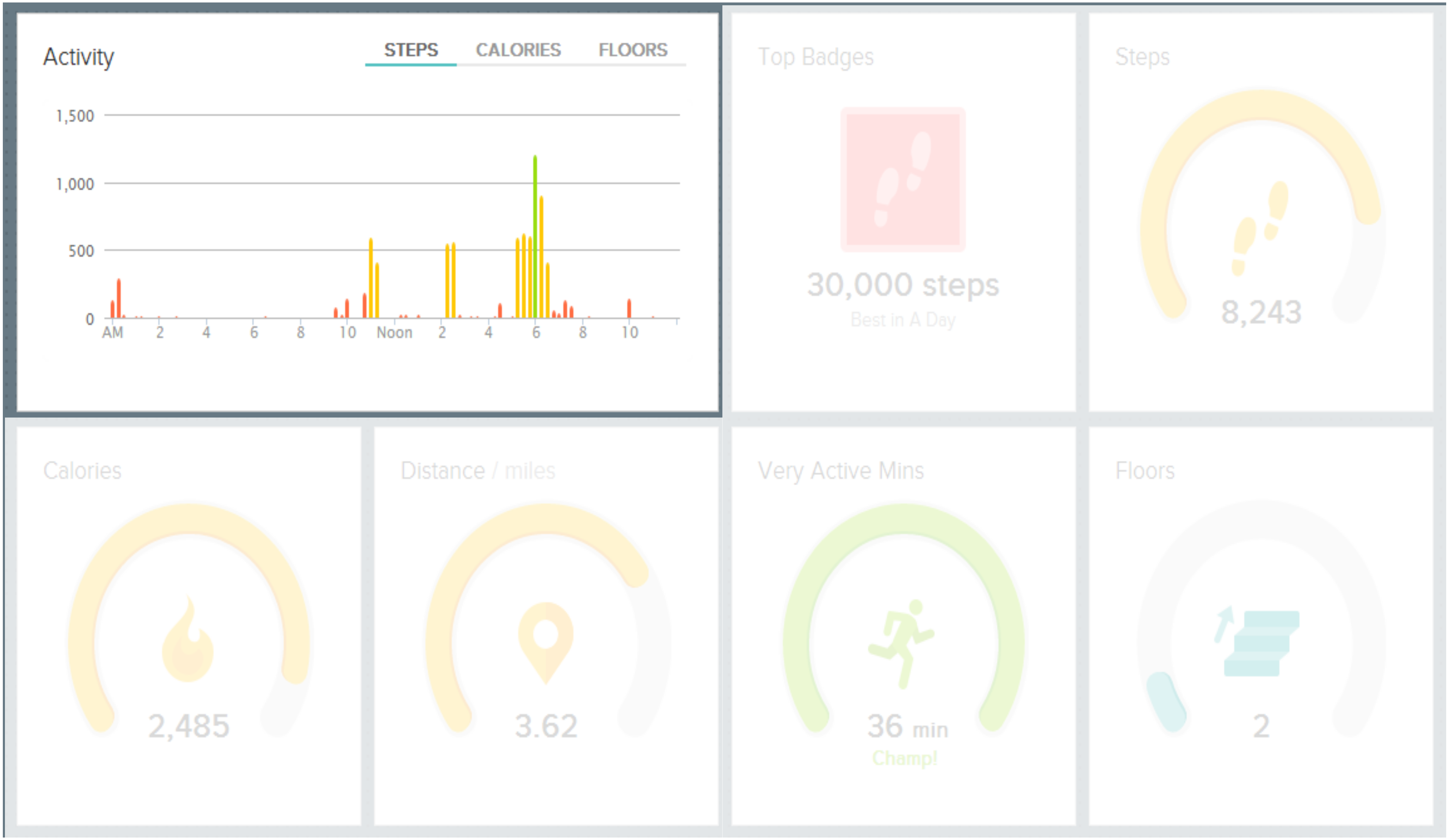
Calories
2,485

Distance / miles
3.62

Very Active Mins
36 min
Champ!

Floors
2

fitbit


Activity
STEPS
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1,500
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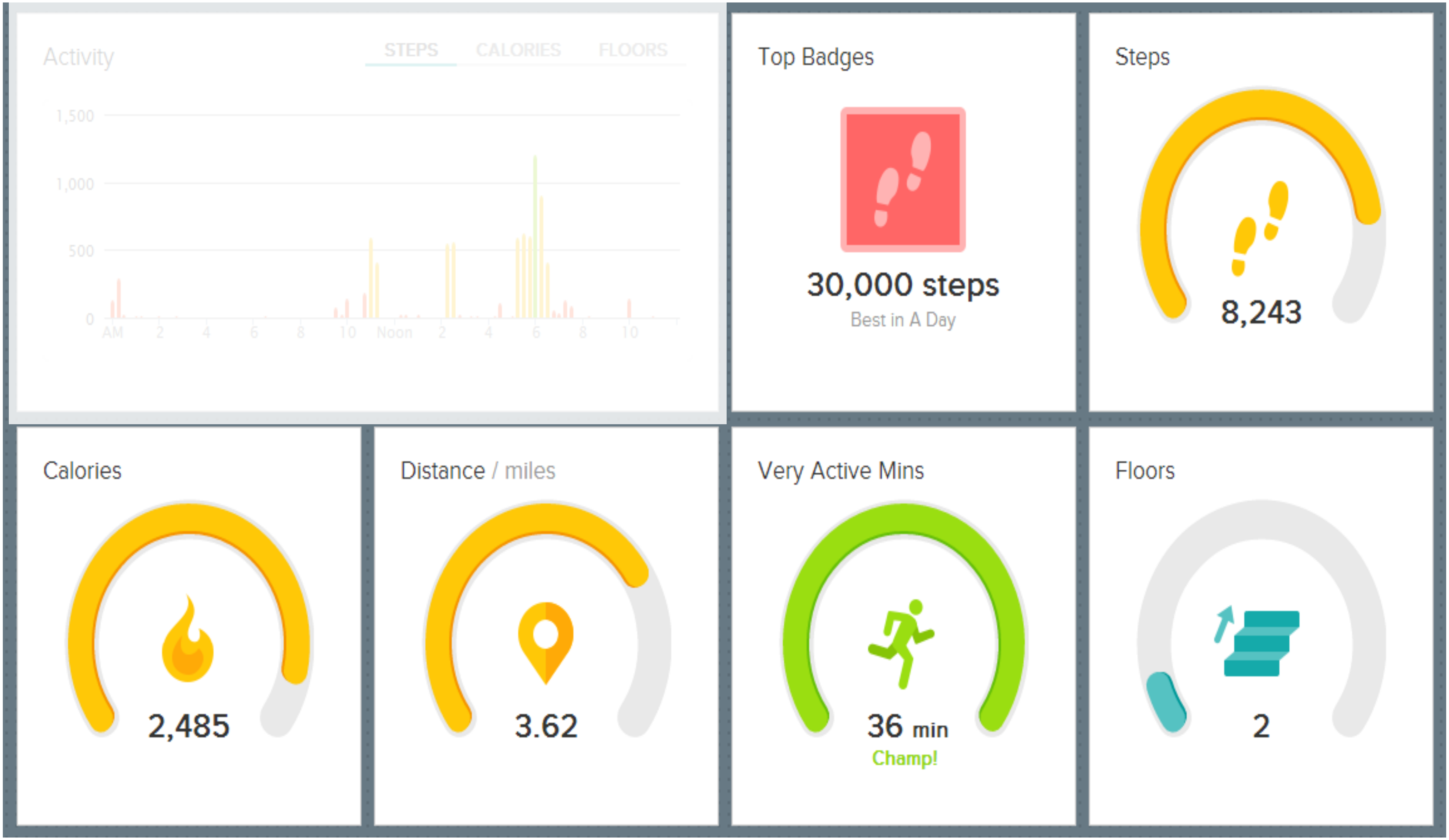
Activity
STEPS
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FLOORS
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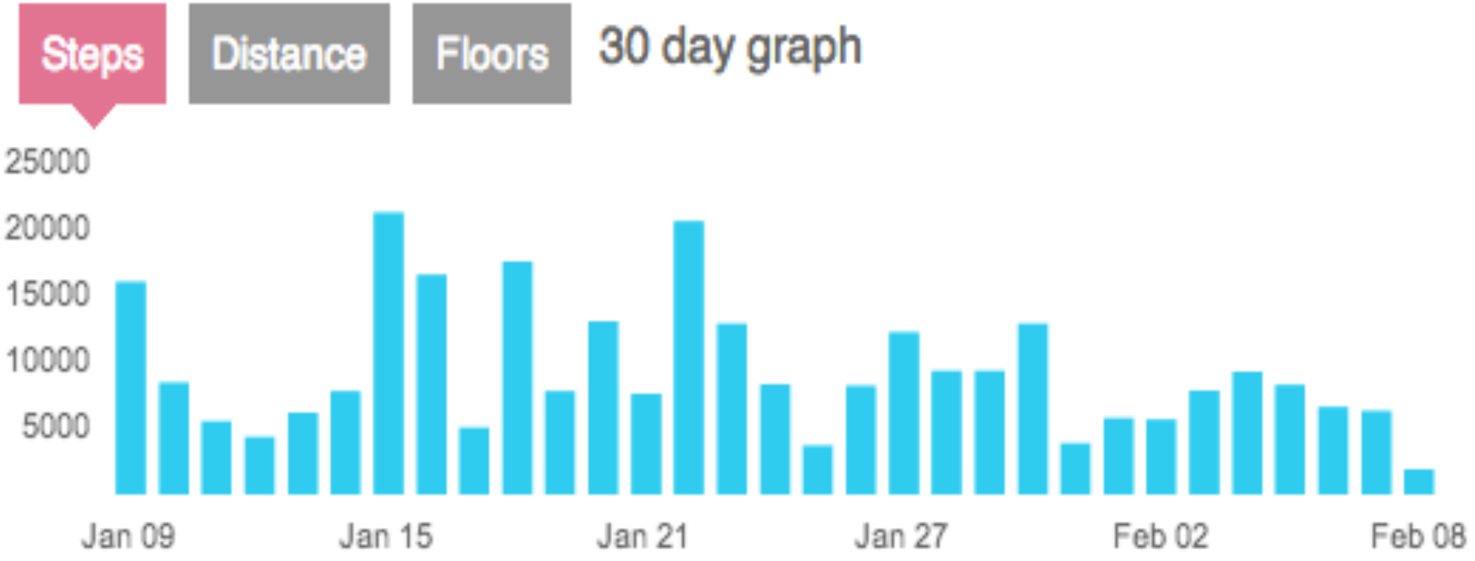
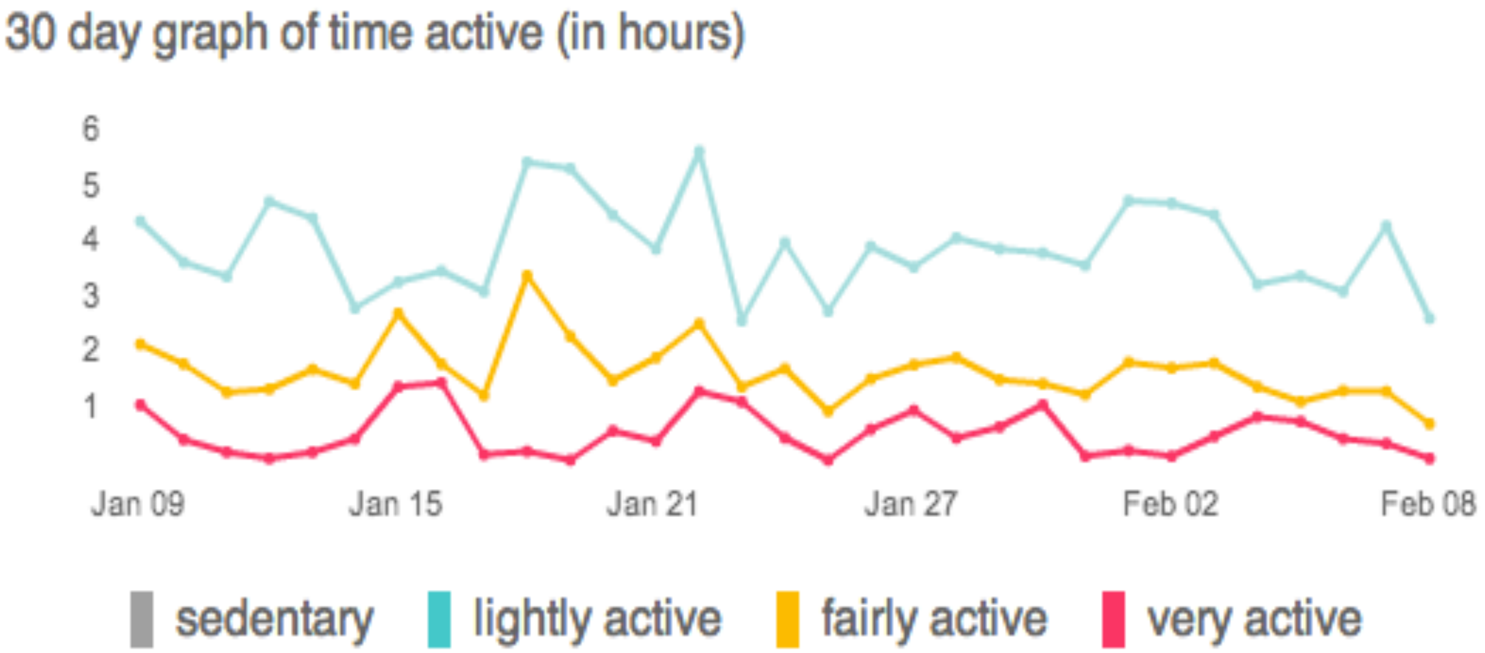
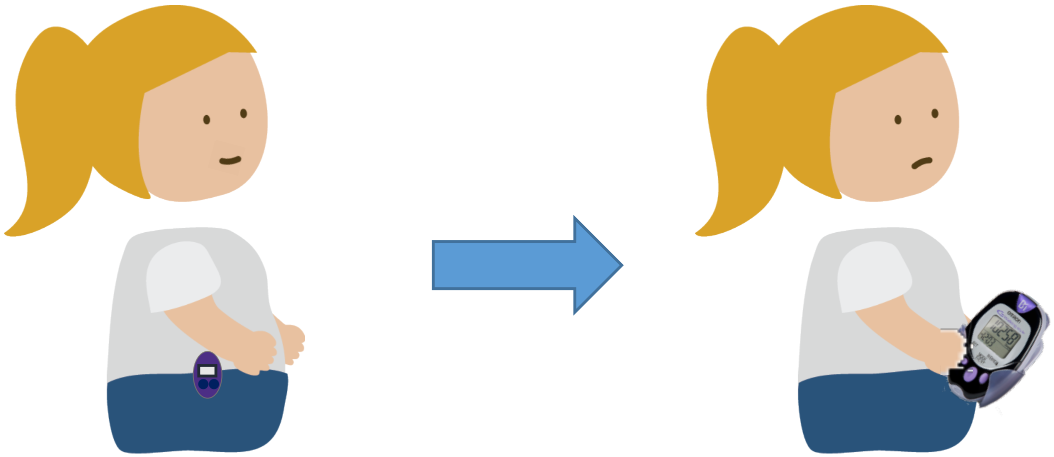
Floors
2

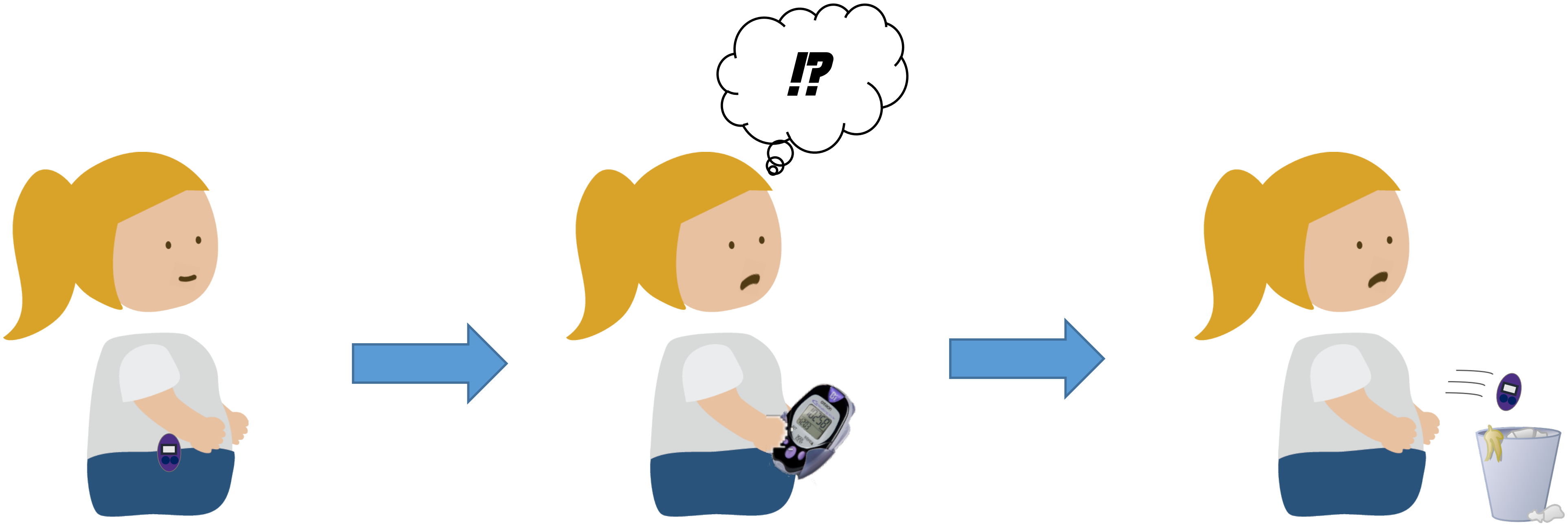
fitbit


Steps
Distance
Floors
30 day graph
25000
20000
15000
10000
5000
Jan 09
Jan 15
Jan 21
Jan 27
Feb 02
Feb 08


30 day graph of time active (in hours)
6
5
4
3
2
1
Jan 09
Jan 15
Jan 21
Jan 27
Feb 02
Feb 08
sedentary
lightly active
fairly active
very active

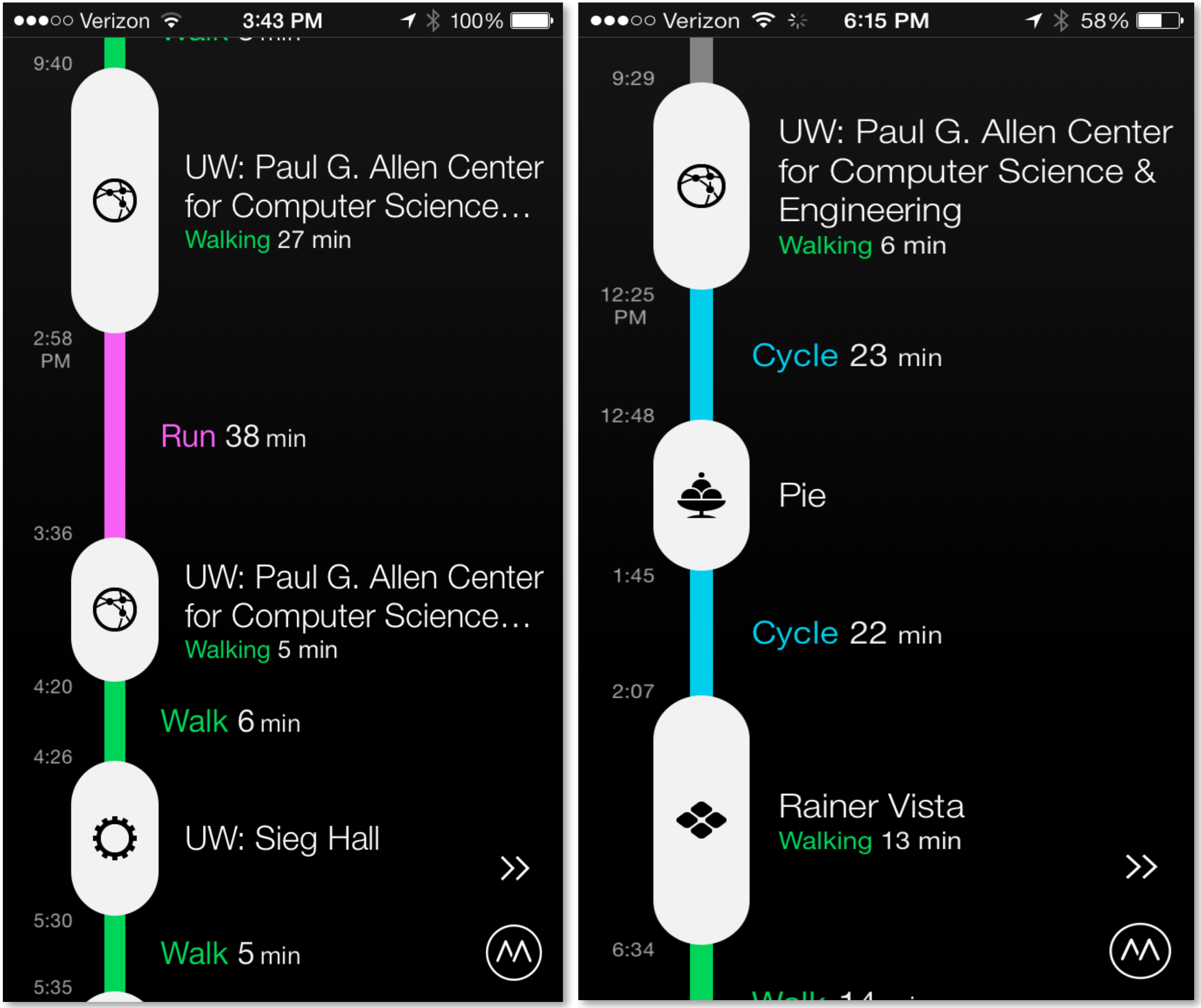
fitbit





Epstein DA, Ping A, Fogarty J, Munson SA. *UbiComp* 2015.
A Lived Informatics Model of Personal Informatics.

Epstein DA, Ping A, Caraway M, Johnston C, Fogarty J, Munson SA. *CHI* 2016.
Beyond Abandonment to Next Steps:
Understanding and Designing for Life after Personal Informatics Tool Use.



●●●○○ Verizon 3:43 PM 100%

9:40

UW: Paul G. Allen Center for Computer Science…
Walking 27 min

2:58 PM

Run 38 min

3:36

UW: Paul G. Allen Center for Computer Science…
Walking 5 min

4:20

Walk 6 min

4:26

UW: Sieg Hall

5:30

Walk 5 min

5:35

●●●○○ Verizon 6:15 PM 58%

9:29

UW: Paul G. Allen Center for Computer Science & Engineering
Walking 6 min

12:25 PM

Cycle 23 min

12:48

Pie

1:45

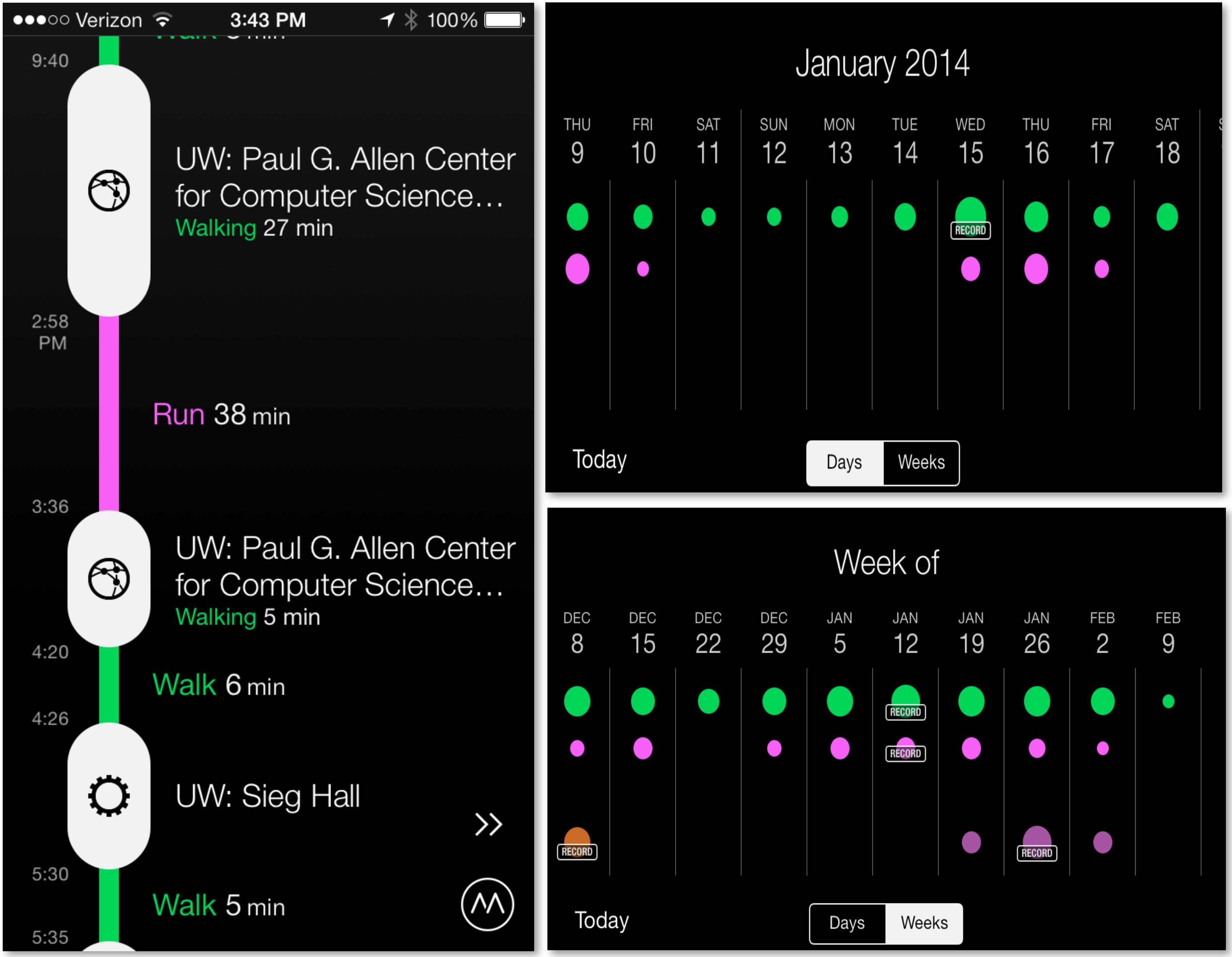
Cycle 22 min

2:07

Rainer Vista
Walking 13 min

6:34

Moves, commercial lifelogging application developed by ProtoGeo and acquired by Facebook.


●●●○○ Verizon
3:43 PM
100%
January 2014
THU 9
FRI 10
SAT 11
SUN 12
MON 13
TUE 14
WED 15
THU 16
FRI 17
SAT 18
RECORD
Today
Days
Weeks
Week of
DEC 8
DEC 15
DEC 22
DEC 29
JAN 5
JAN 12
JAN 19
JAN 26
FEB 2
FEB 9
RECORD
RECORD
RECORD
RECORD
Today
Days
Weeks

9:40

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What do Behavior Change Seeking Trackers Want?

They want to use lifelogs to:

Increase awareness of activity
Increase their motivation
Find patterns in their behavior
Identify opportunities for change

Epstein D.A., Cordeiro F., Bales E., Fogarty J., Munson S.A. *DIS 2014.*
"Taming Data Complexity in Lifelogs: Exploring Visual Cuts of Personal Informatics Data"

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Where do I eat?
How can I walk more?
How do I travel?
What do my inactive days look like?

Epstein D.A., Cordeiro F., Bales E., Fogarty J., Munson S.A. *DIS 2014.*
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Where do I eat?
How can I walk more?
How do I travel?
What do my inactive days look like?

Aggregation, but also reduction and focus.

Epstein D.A., Cordeiro F., Bales E., Fogarty J., Munson S.A. *DIS 2014.*
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selecting data: cuts

- A subset of data with a common feature:
  - Temporal cuts
  - Visit a particular type of location
  - Follow a transit pattern

- To enable people to query their data to identify opportunities for change or successes to repeat.

Epstein D.A., Cordeiro F., Bales E., Fogarty J., Munson S.A. *DIS 2014.*
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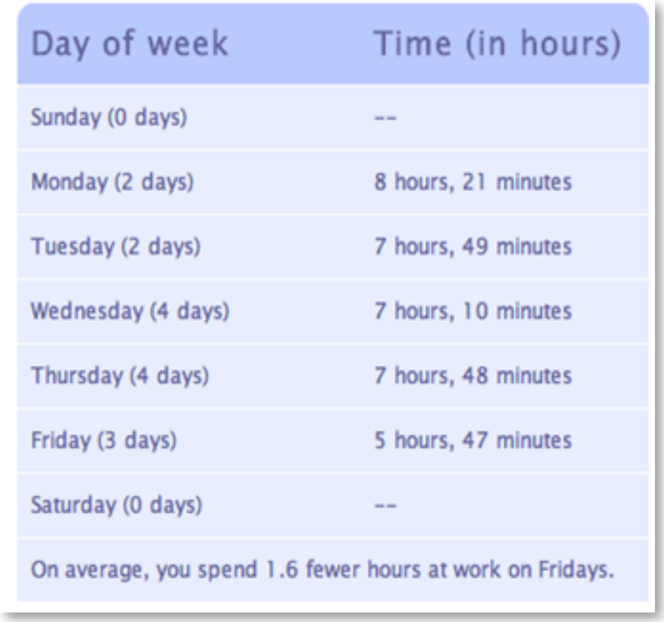
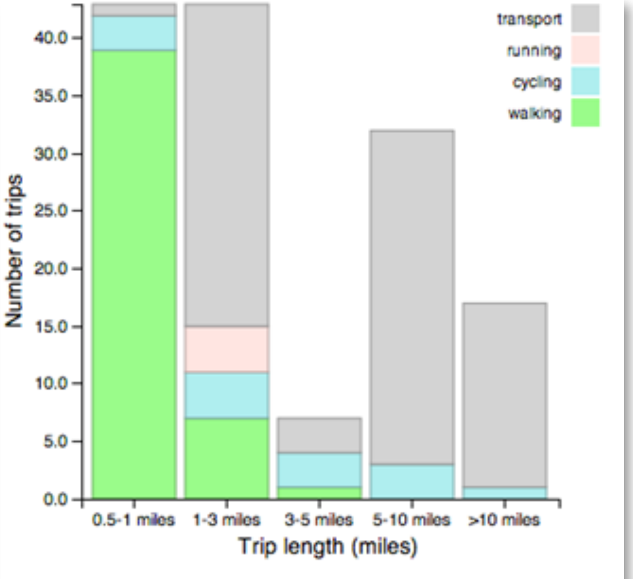
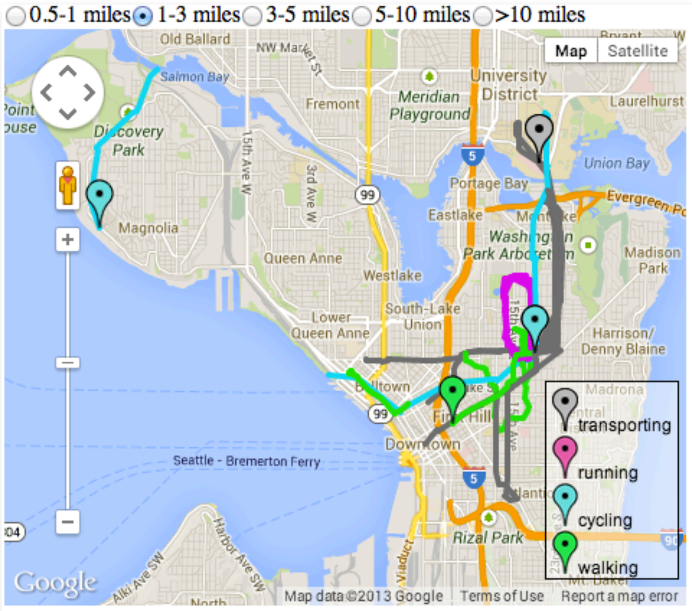


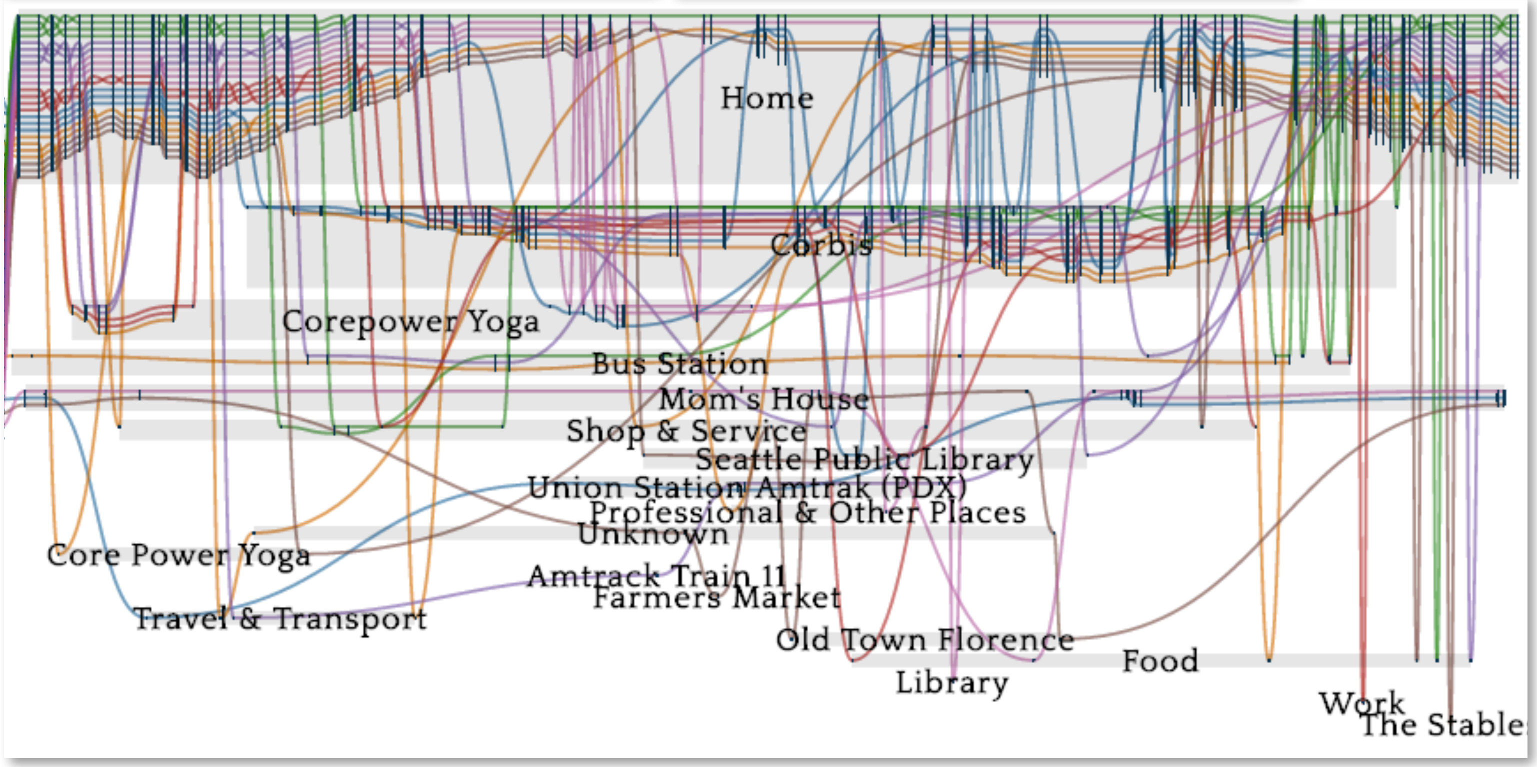
Day of week	Time (in hours)
Sunday (0 days)	--
Monday (2 days)	8 hours, 21 minutes
Tuesday (2 days)	7 hours, 49 minutes
Wednesday (4 days)	7 hours, 10 minutes
Thursday (4 days)	7 hours, 48 minutes
Friday (3 days)	5 hours, 47 minutes
Saturday (0 days)	--

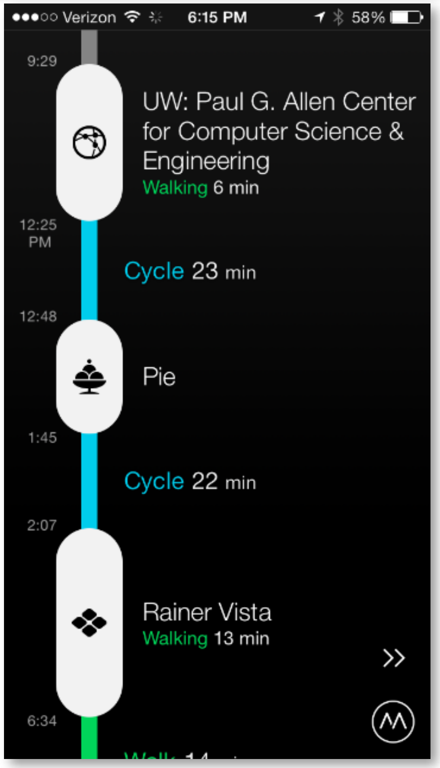
On average, you spend 1.6 fewer hours at work on Fridays.



You transport 2% of the time you travel less than 1 miles.


○ 0.5-1 miles ● 1-3 miles ○ 3-5 miles ○ 5-10 miles ○ >10 miles
Map
Satellite
Old Ballard
Salmon Bay
Discovery Park
Magnolia
Fremont
Meridian Playground
University District
Laurelhurst
Union Bay
Portage Bay
Eastlake
Washington Park Arboretum
Madison Park
Queen Anne
Westlake
South Lake Union
Lower Queen Anne
Harrison/ Denny Blaine
Madrona
Downtown
Seattle - Bremerton Ferry
Rizal Park
transporting
running
cycling
walking
Google
Map data ©2013 Google
Terms of Use
Report a map error





●●●○○ Verizon 6:15 PM 58%

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6:34

Epstein D.A., Cordeiro F., Bales E., Fogarty J., Munson S.A. *DIS 2014.*
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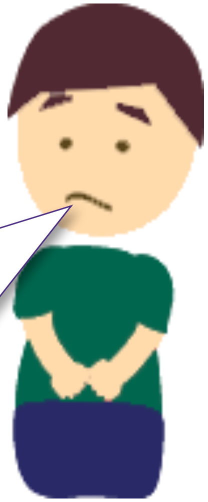
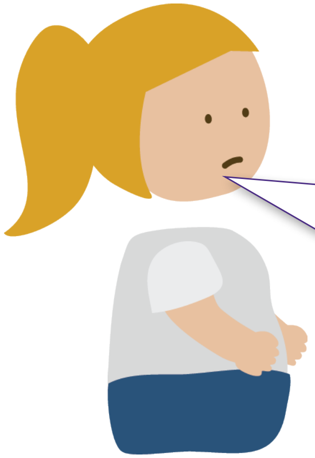
Maybe on average on Tuesdays I don’t cycle much. Maybe there was a day that I did. To be able to think about why that was so I could maybe think about how to change what I was doing.

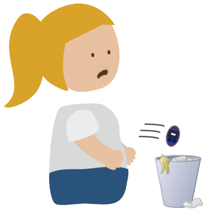


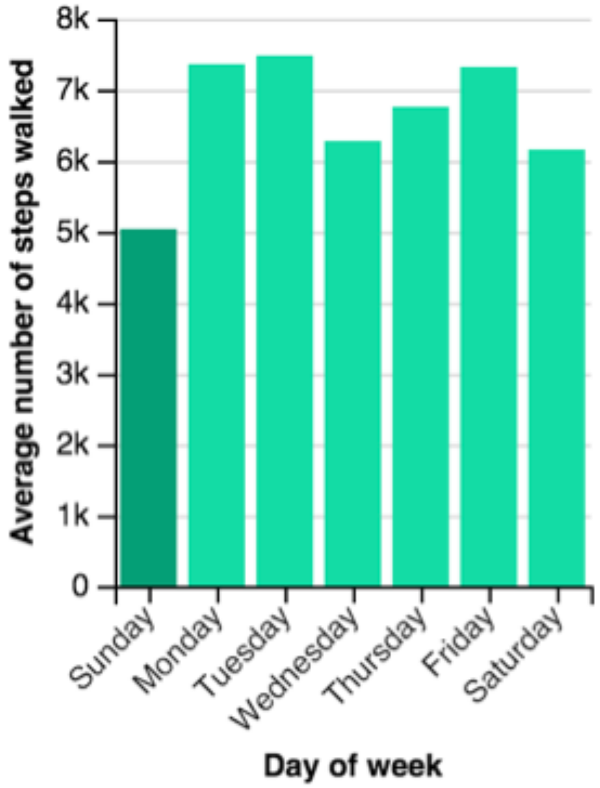


If I notice that I’m most active on Tuesdays, then obviously there’s something about Tuesdays that I should start doing on other days. That’s actionable data.

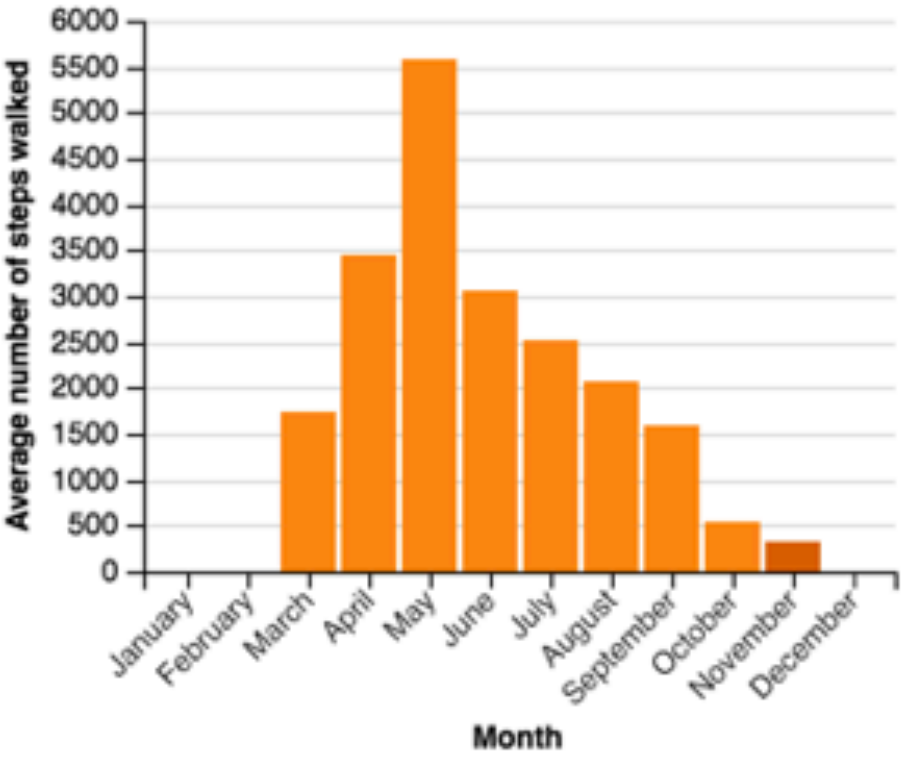
Epstein D.A., Cordeiro F., Bales E., Fogarty J., Munson S.A. *DIS 2014.*
“Taming Data Complexity in Lifelogs: Exploring Visual Cuts of Personal Informatics Data”

People can find cuts valuable even after they quit using the tool.





You walked an average of 5,055 steps on Sundays. What prevents you from walking more?



You walked an average of 321 steps per day during November. Would you consider starting to use your Fitbit again?

Present data with reduction and focus, but allow exploration.

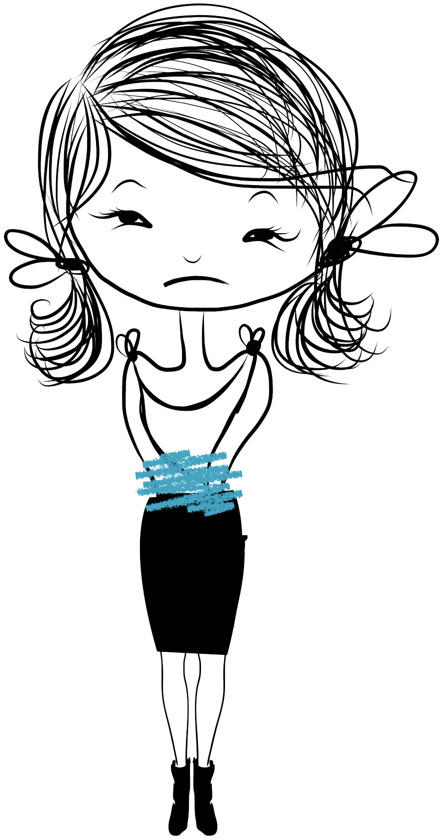
Irritable Bowel Syndrome (IBS)

Characterized by episodic gastrointestinal symptoms.

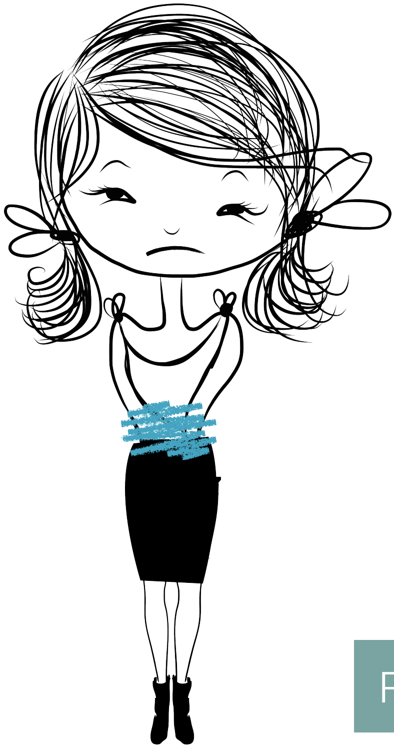
Affects up to 20% of the US population.

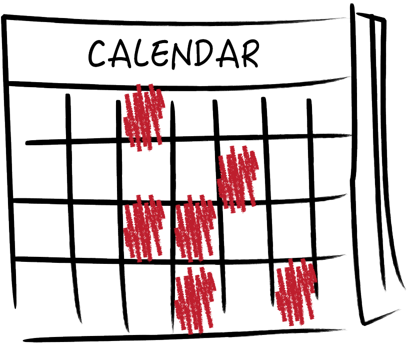
Potential **individualized** triggers:

- certain nutrients
- eating behaviors
- stress
- sleep disturbances
- menstruation



Jane





Severe Symptoms

Missing Work

Needs Help

Preparation

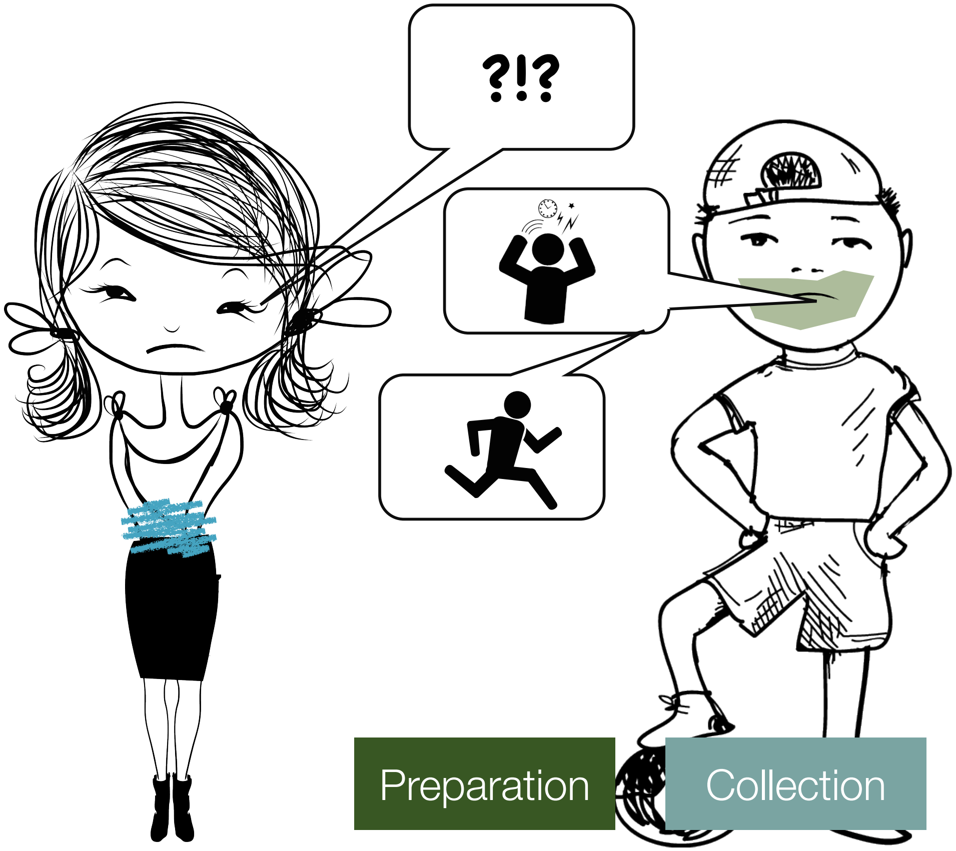
Collection

Integration

Reflection

Action

Jane



unsure what to do

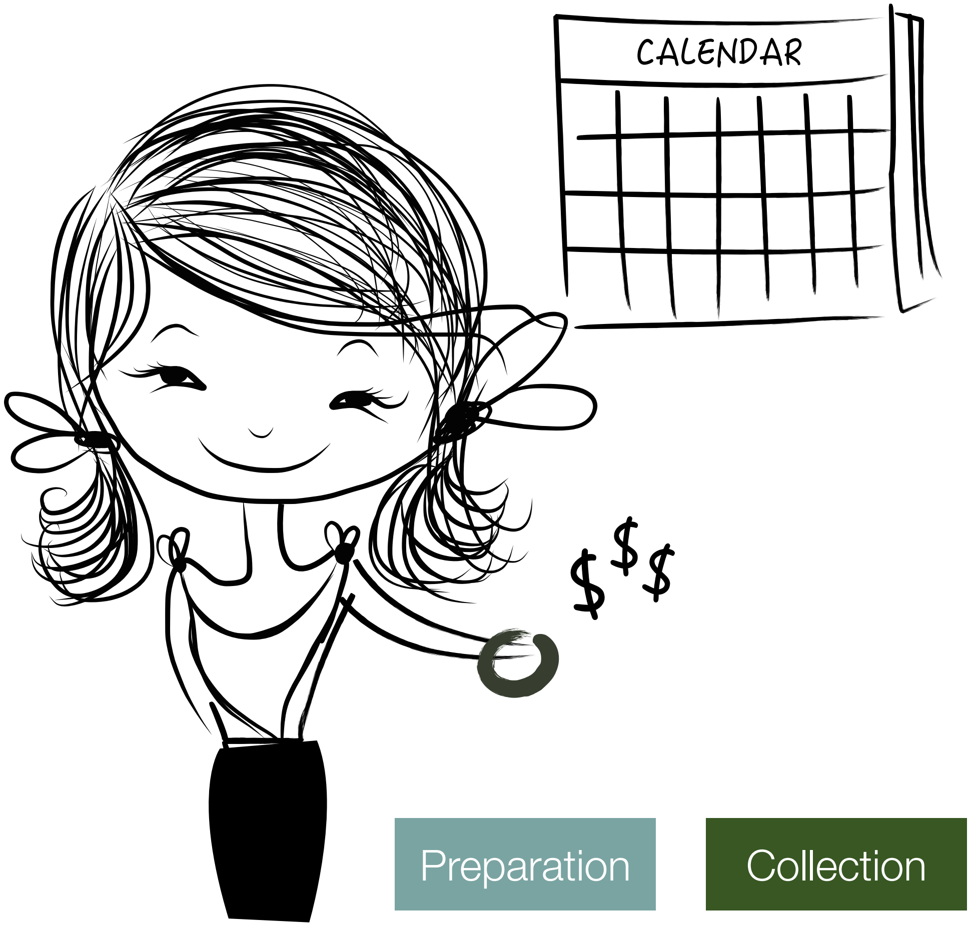
Consults Brother

Had Similar Symptoms

Shares his Triggers

- Stress & Exercise

Preparation | Collection | Integration | Reflection | Action



tracks stress & physical activity

Buys a Fitness Band

Tracks Mood

Tracks Physical Activity

Preparation | **Collection** | Integration | Reflection | Action

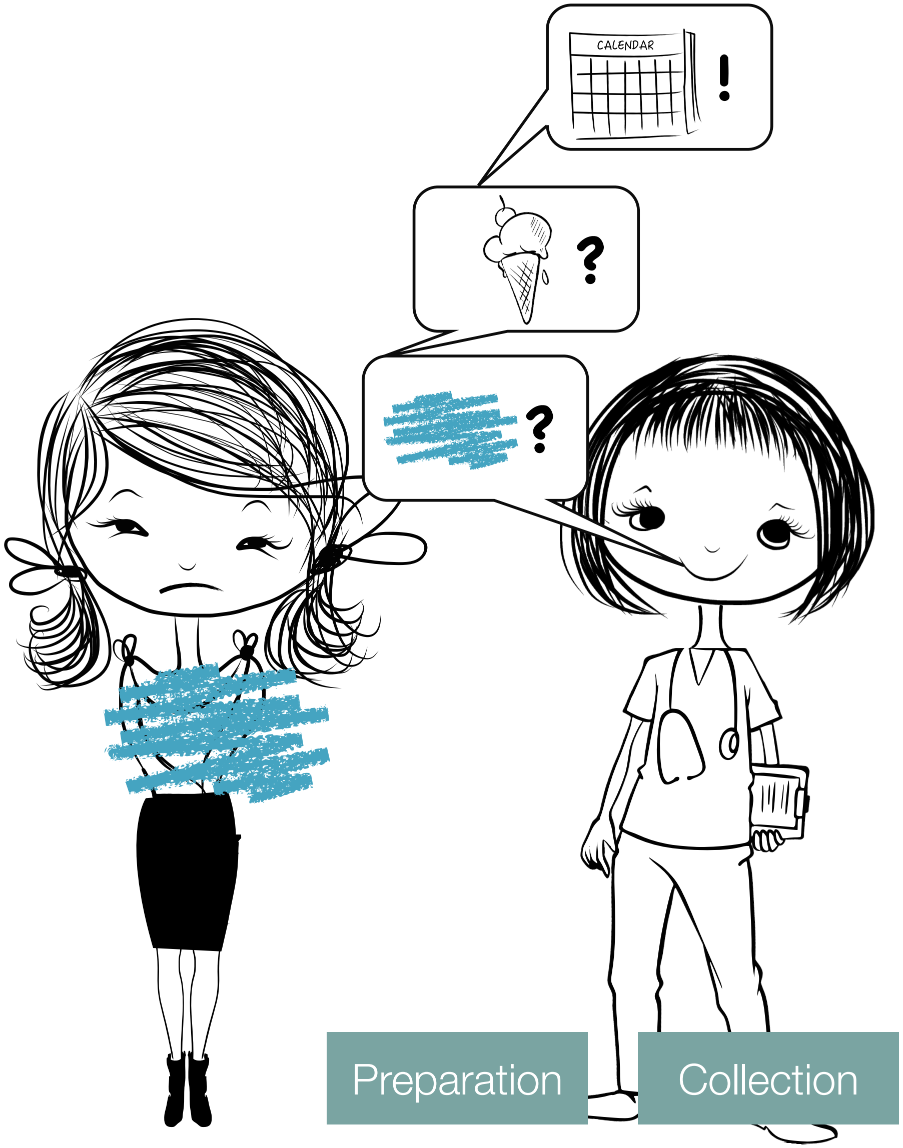
(tries to) make sense of the data

Lots of Data

- Mood Over Time
- Activity Over Time

But No Understanding

Preparation
Collection
Integration
Reflection
Action



maybe her doctor can help?

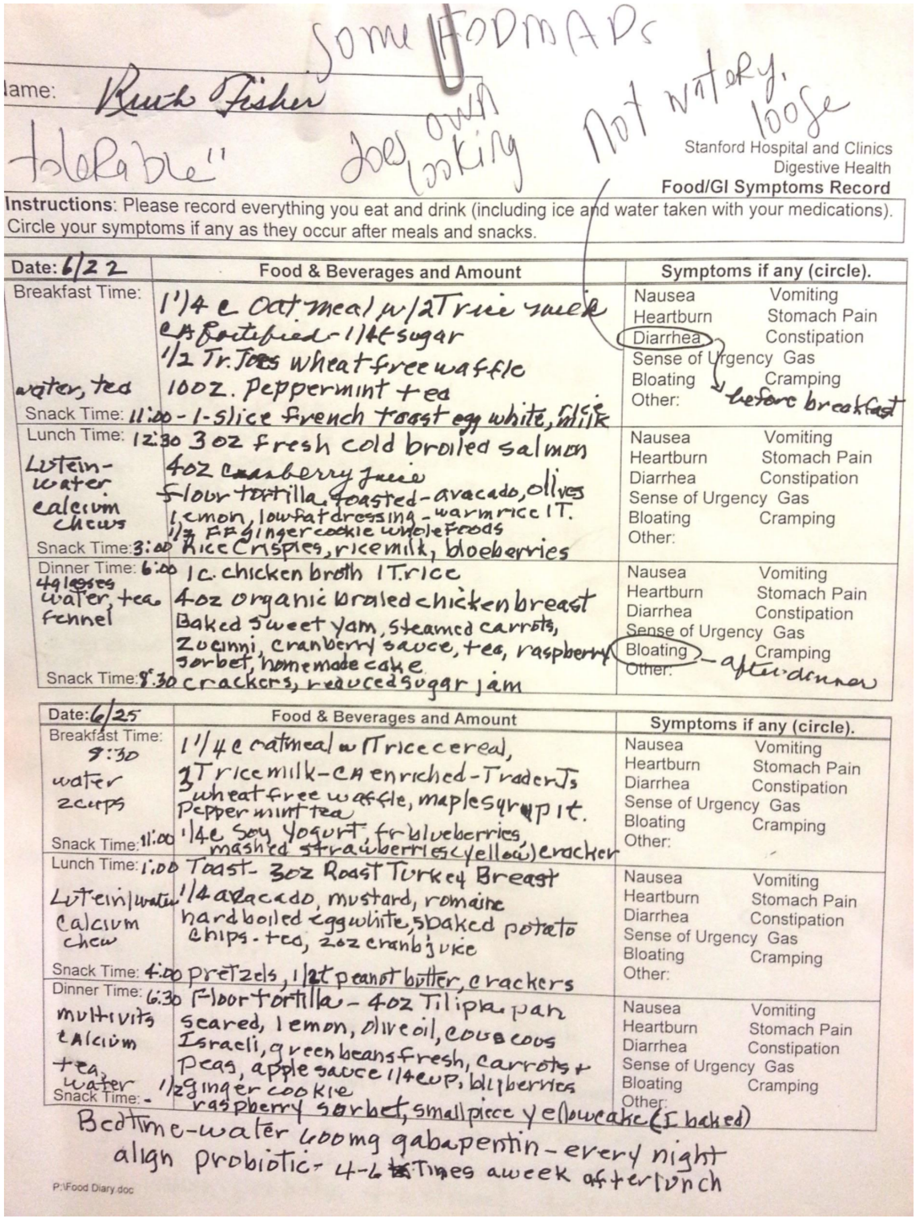
Did not Track Symptoms

Did not Track Food

Elimination Diet
    Difficult to Follow
    Difficult to Interpret
    Lengthy Process
    Possibly Inconclusive

Preparation | Collection | Integration | **Reflection** | Action

current standard of care



some FODMAPs

Name: Ruth Fisher

"tolerable" does own cooking Not watery, loose

Stanford Hospital and Clinics
Digestive Health
Food/GI Symptoms Record

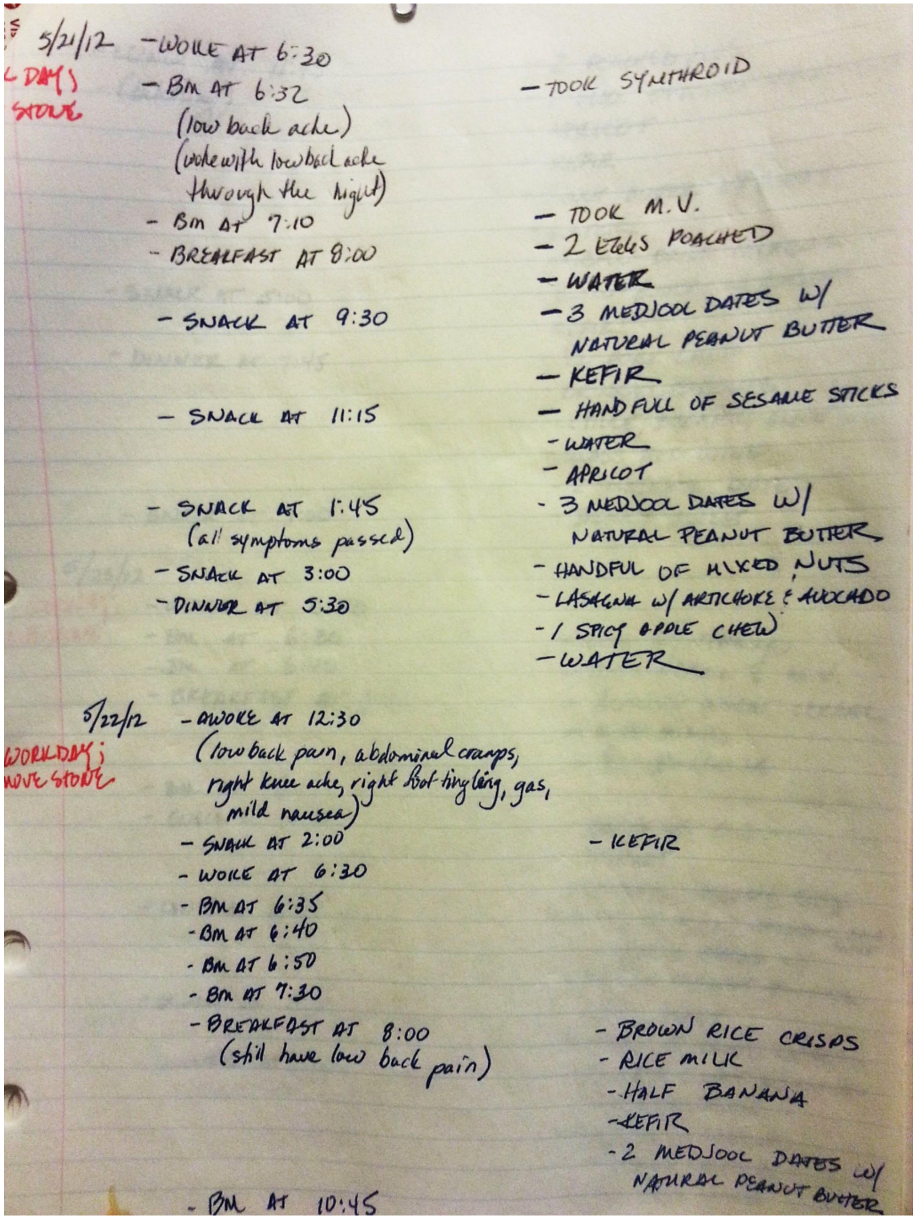
Instructions: Please record everything you eat and drink (including ice and water taken with your medications). Circle your symptoms if any as they occur after meals and snacks.

Date: 6/22	**Food & Beverages and Amount**	**Symptoms if any (circle).**
Breakfast Time: water, tea	1 1/4 c oat meal w/2T rice milk CA fortified - 1/4t sugar 1/2 Tr. Joes wheat free waffle 10oz. peppermint tea	Nausea Vomiting Heartburn Stomach Pain [✓ Diarrhea] Constipation Sense of Urgency Gas Bloating Cramping Other: before breakfast
Snack Time: 11:00	- 1-slice french toast egg white, rice milk	
Lunch Time: 12:30 Lutein-water calcium chews	3 oz fresh cold broiled salmon 4oz cranberry juice flour tortilla, toasted - avacado, olives lemon, lowfat dressing - warm rice 1T. 1/2 FF ginger cookie wholeFoods	Nausea Vomiting Heartburn Stomach Pain Diarrhea Constipation Sense of Urgency Gas Bloating Cramping Other:
Snack Time: 3:00	Rice Crispies, ricemilk, blueberries	
Dinner Time: 6:00 4 glasses water, tea fennel	1c. chicken broth 1T. rice 4oz organic broiled chicken breast Baked sweet yam, steamed carrots, Zucinni, cranberry sauce, tea, raspberry sorbet, homemade cake	Nausea Vomiting Heartburn Stomach Pain Diarrhea Constipation Sense of Urgency Gas [✓ Bloating] Cramping Other: - after dinner
Snack Time: 8:30	crackers, reduced sugar jam	

Date: 6/25	**Food & Beverages and Amount**	**Symptoms if any (circle).**
Breakfast Time: 9:30 water 2 cups	1 1/4 c oatmeal w 1T rice cereal, 3T rice milk - CA enriched - TraderJs wheat free waffle, maple syrup 1t. Peppermint tea	Nausea Vomiting Heartburn Stomach Pain Diarrhea Constipation Sense of Urgency Gas Bloating Cramping Other:
Snack Time: 11:00	1/4 c Soy Yogurt, fr blueberries, mashed strawberries (yellow) cracker	
Lunch Time: 1:00 Lutein/water Calcium chew	Toast - 3oz Roast Turkey Breast 1/4 avacado, mustard, romaine hard boiled egg white, 5 baked potato chips - tea, 2oz cranb juice	Nausea Vomiting Heartburn Stomach Pain Diarrhea Constipation Sense of Urgency Gas Bloating Cramping Other:
Snack Time: 4:00	pretzels, 1/2t peanut butter, crackers	
Dinner Time: 6:30 multivits calcium tea, water	Floor tortilla - 4oz Tilipia pan seared, lemon, olive oil, cous cous Israeli, green beans fresh, carrots + peas, apple sauce 1/4 cup, blueberries 1/2 ginger cookie	Nausea Vomiting Heartburn Stomach Pain Diarrhea Constipation Sense of Urgency Gas Bloating Cramping Other:
Snack Time: -	raspberry sorbet, small piece yellow cake (I baked)	

Bedtime - water 600mg gabapentin - every night
align probiotic - 4-6 Times a week after lunch

P:\Food Diary.doc



5/21/12
DAY(S)
STONE

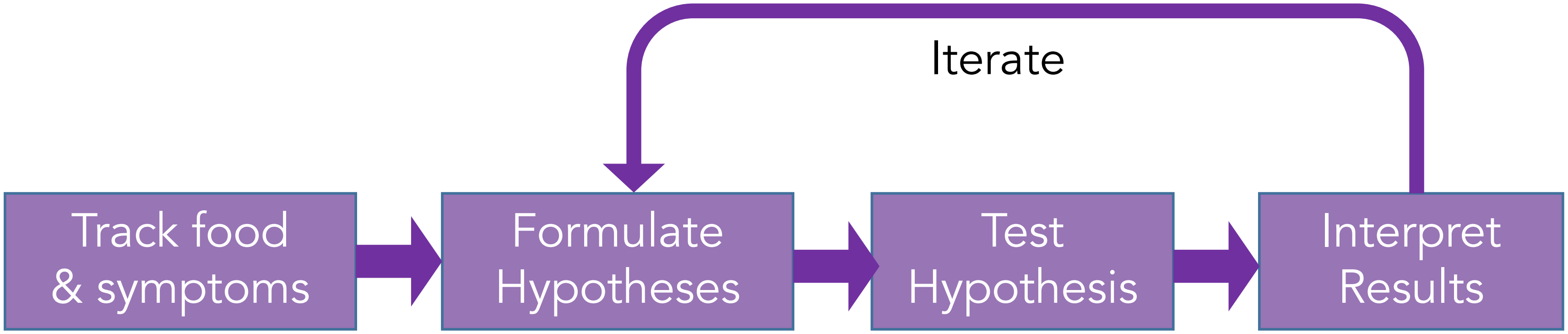
- WOKE AT 6:30
- BM AT 6:32 (low back ache) (woke with low back ache through the night) — TOOK SYNTHROID
- BM AT 7:10 — TOOK M.V.
- BREAKFAST AT 8:00 — 2 EGGS POACHED
  - WATER
- SNACK AT 9:30 — 3 MEDJOOL DATES W/ NATURAL PEANUT BUTTER
  - KEFIR
- SNACK AT 11:15 — HAND FULL OF SESAME STICKS
  - WATER
  - APRICOT
- SNACK AT 1:45 (all symptoms passed) — 3 MEDJOOL DATES W/ NATURAL PEANUT BUTTER
- SNACK AT 3:00 — HANDFUL OF MIXED NUTS
- DINNER AT 5:30 — LASAGNA W/ ARTICHOKE & AVOCADO
  - 1 SPICY APPLE CHEW
  - WATER

5/22/12
WORKDAY;
MOVE STONE

- AWOKE AT 12:30 (low back pain, abdominal cramps, right knee ache, right foot tingling, gas, mild nausea)
- SNACK AT 2:00 — KEFIR
- WOKE AT 6:30
- BM AT 6:35
- BM AT 6:40
- BM AT 6:50
- BM AT 7:30
- BREAKFAST AT 8:00 (still have low back pain) — BROWN RICE CRISPS
  - RICE MILK
  - HALF BANANA
  - KEFIR
  - 2 MEDJOOL DATES W/ NATURAL PEANUT BUTTER
- BM AT 10:45

recasting self-tracking

- Hypothesis formation based on journals
- Rethinking trigger detection to rigorously test hypotheses while reducing patient and provider burden.



Iterate

Track food & symptoms

Formulate Hypotheses

Test Hypothesis

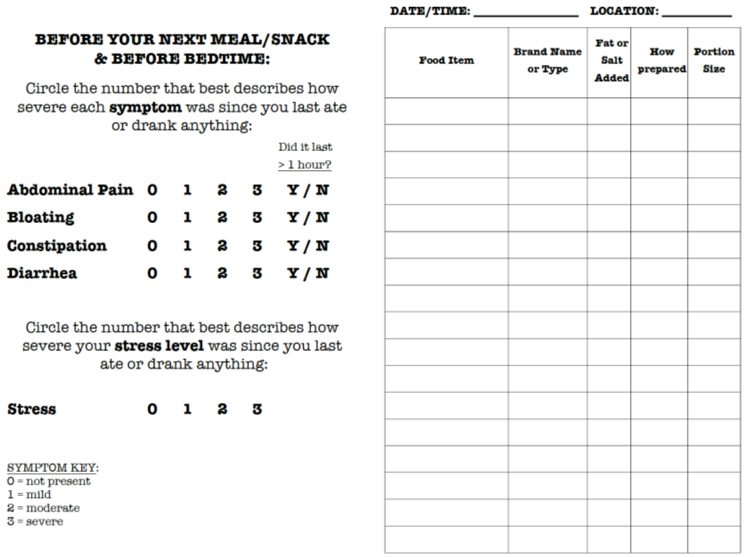
Interpret Results

recasting self-tracking

- **Hypothesis formation based on journals**
- Rethinking trigger detection to rigorously test hypotheses while reducing patient and provider burden

J. Schroeder, J Hoffswell, CF Chung, J Fogarty, SA Munson, J Zia. *CSCW 2017.*
Supporting Patient-Provider Collaboration to Identify Individual Triggers using Food and Symptom Journals.

new analysis tools



DATE/TIME: ____________ LOCATION: _________

BEFORE YOUR NEXT MEAL/SNACK & BEFORE BEDTIME:

Circle the number that best describes how severe each **symptom** was since you last ate or drank anything:

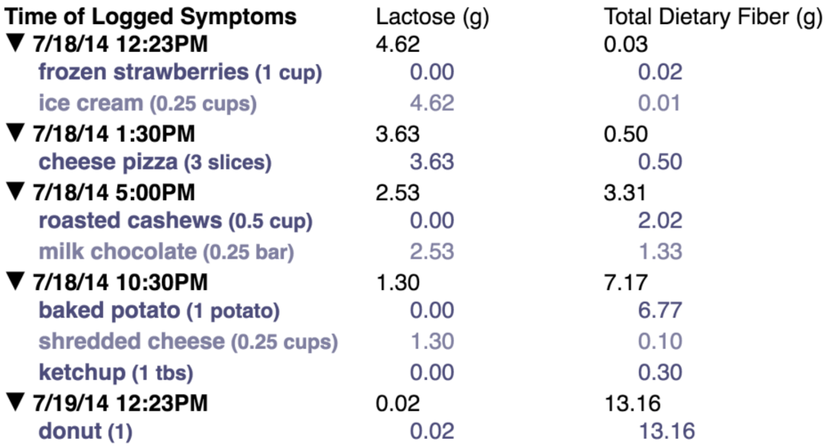
					Did it last > 1 hour?
Abdominal Pain	0	1	2	3	Y / N
Bloating	0	1	2	3	Y / N
Constipation	0	1	2	3	Y / N
Diarrhea	0	1	2	3	Y / N

Circle the number that best describes how severe your **stress level** was since you last ate or drank anything:

Stress	0	1	2	3

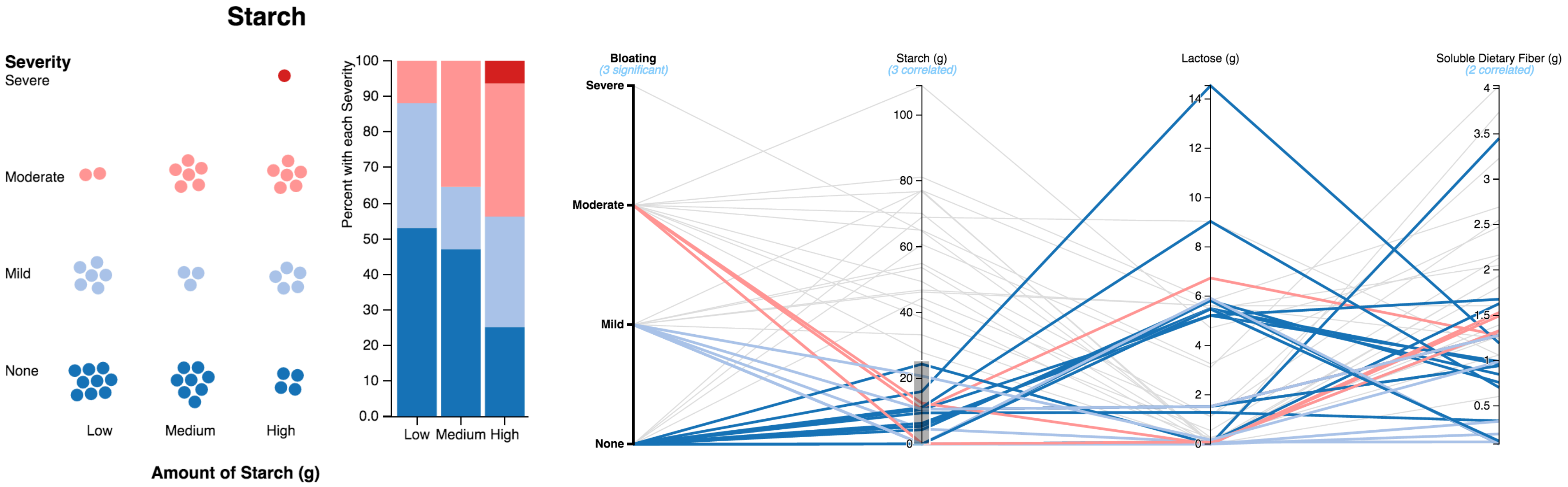
SYMPTOM KEY:
0 = not present
1 = mild
2 = moderate
3 = severe

Food Item	Brand Name or Type	Fat or Salt Added	How prepared	Portion Size

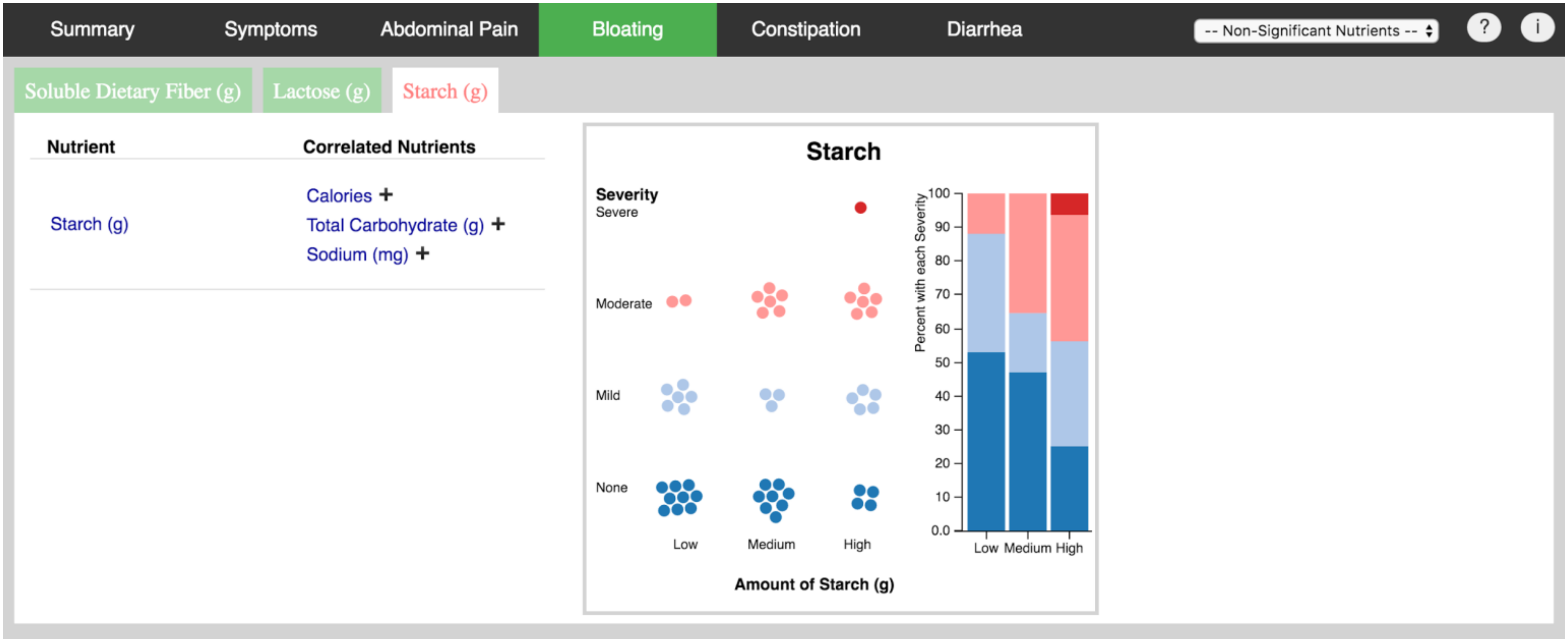


Time of Logged Symptoms	Lactose (g)	Total Dietary Fiber (g)
▼ 7/18/14 12:23PM	4.62	0.03
frozen strawberries (1 cup)	0.00	0.02
ice cream (0.25 cups)	4.62	0.01
▼ 7/18/14 1:30PM	3.63	0.50
cheese pizza (3 slices)	3.63	0.50
▼ 7/18/14 5:00PM	2.53	3.31
roasted cashews (0.5 cup)	0.00	2.02
milk chocolate (0.25 bar)	2.53	1.33
▼ 7/18/14 10:30PM	1.30	7.17
baked potato (1 potato)	0.00	6.77
shredded cheese (0.25 cups)	1.30	0.10
ketchup (1 tbs)	0.00	0.30
▼ 7/19/14 12:23PM	0.02	13.16
donut (1)	0.02	13.16

visualizing results



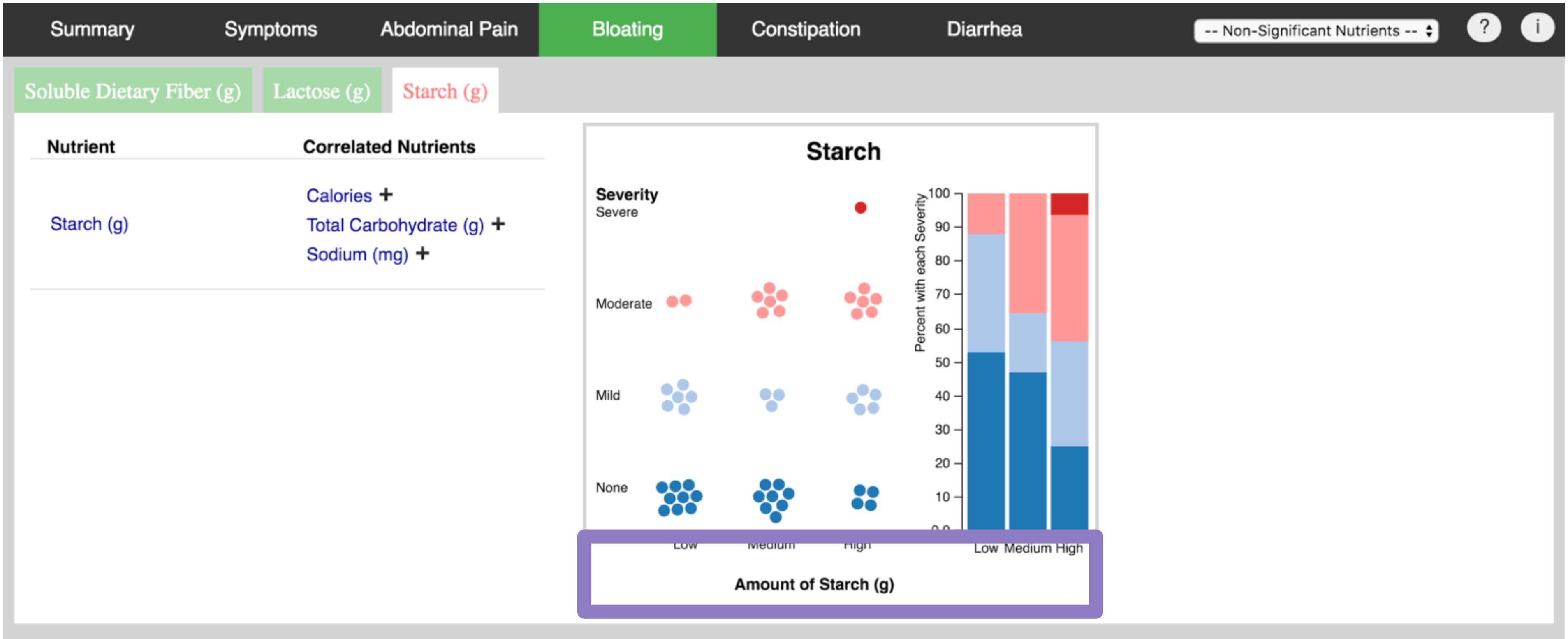
visualizing results: bubble and bar chart


Summary
Symptoms
Abdominal Pain
Bloating
Constipation
Diarrhea
-- Non-Significant Nutrients --
?
i
Soluble Dietary Fiber (g)
Lactose (g)
Starch (g)

Nutrient	Correlated Nutrients
Starch (g)	Calories + Total Carbohydrate (g) + Sodium (mg) +

Starch
Severity
Severe
Moderate
Mild
None
Low
Medium
High
Amount of Starch (g)
Percent with each Severity
100
90
80
70
60
50
40
30
20
10
0.0
Low
Medium
High

visualizing results: bubble and bar chart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50
40
30
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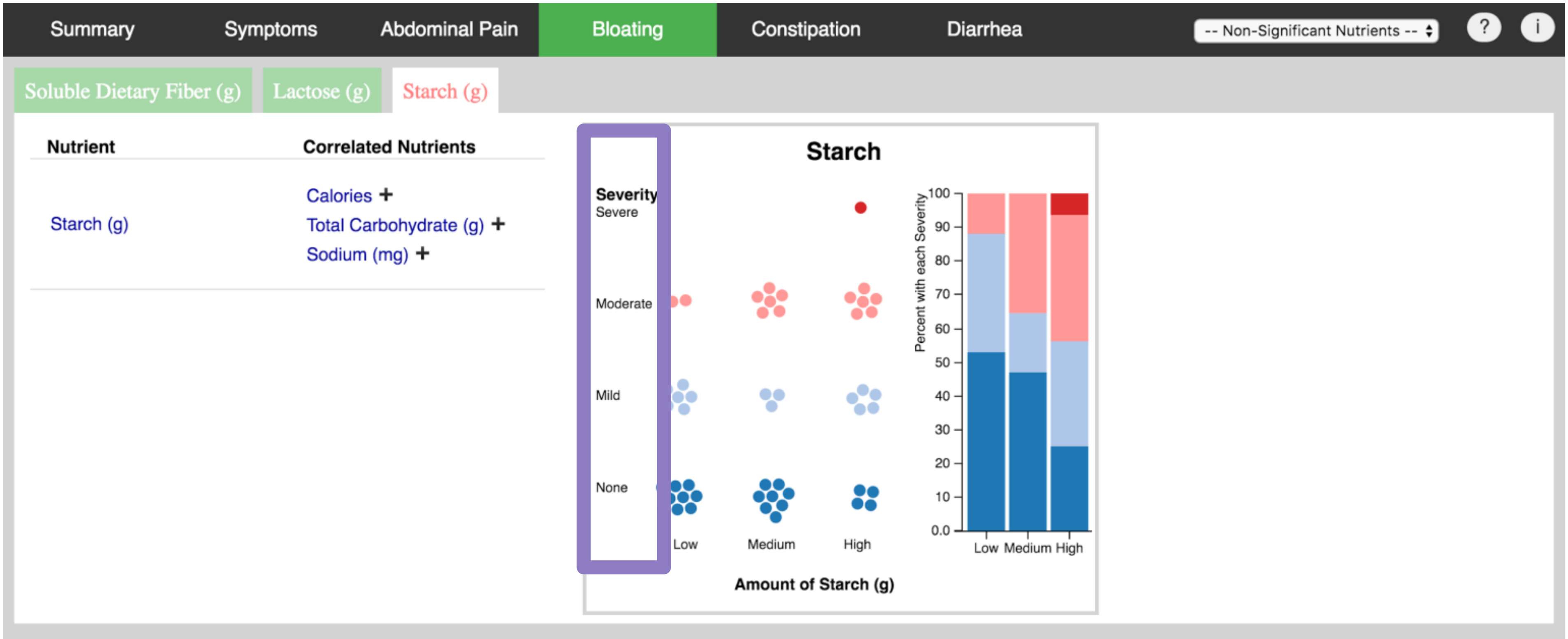
Low
Medium
High

Nutrient	Correlated Nutrients
Starch (g)	Calories + Total Carbohydrate (g) + Sodium (mg) +

visualizing results: bubble and bar chart



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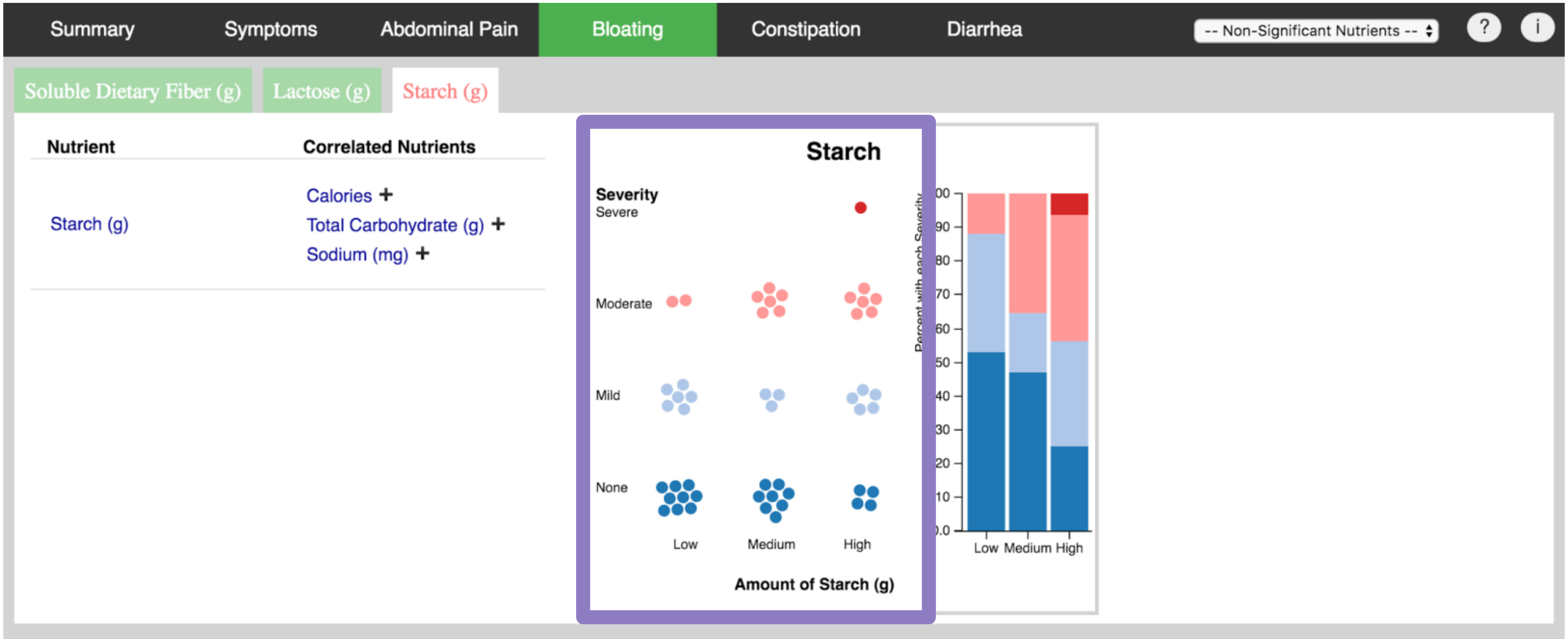
visualizing results: bubble and bar chart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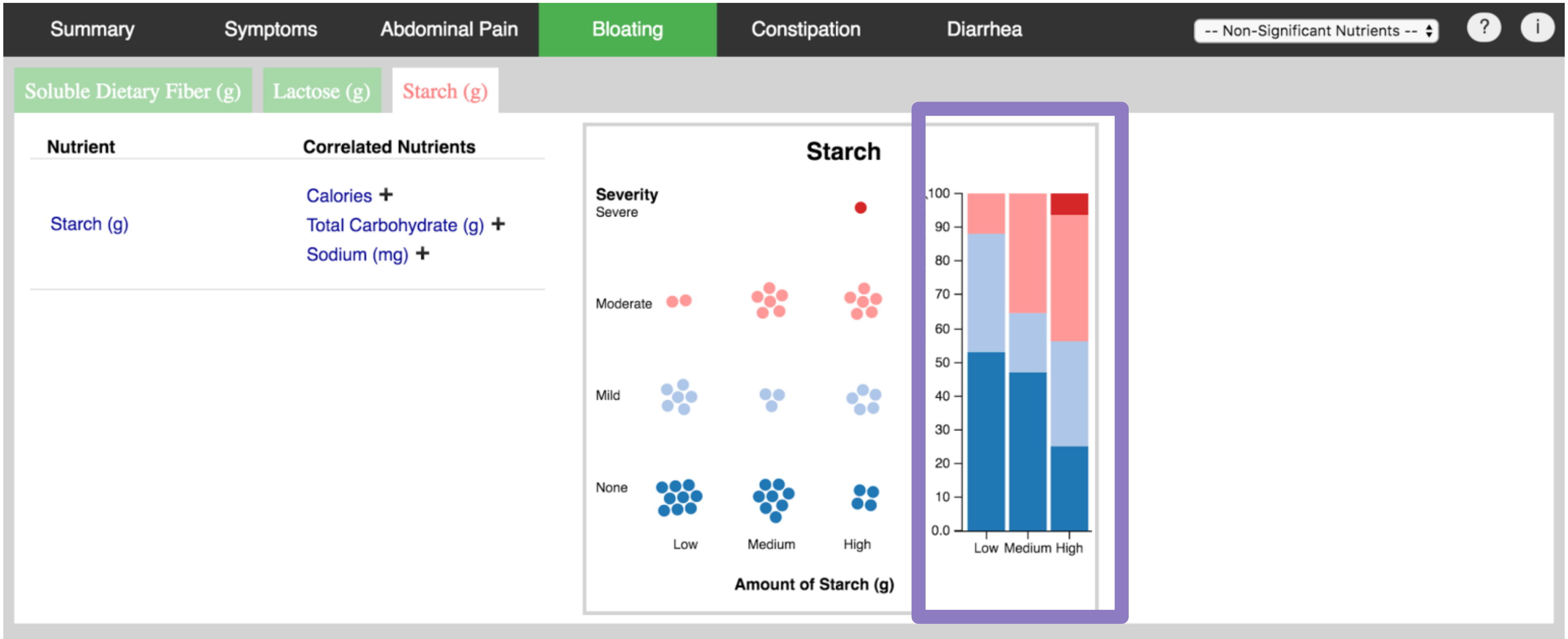
Low
Medium
High

Nutrient	Correlated Nutrients
Starch (g)	Calories + Total Carbohydrate (g) + Sodium (mg) +

visualizing results: bubble and bar chart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Amount of Starch (g)
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90
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30
20
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Low
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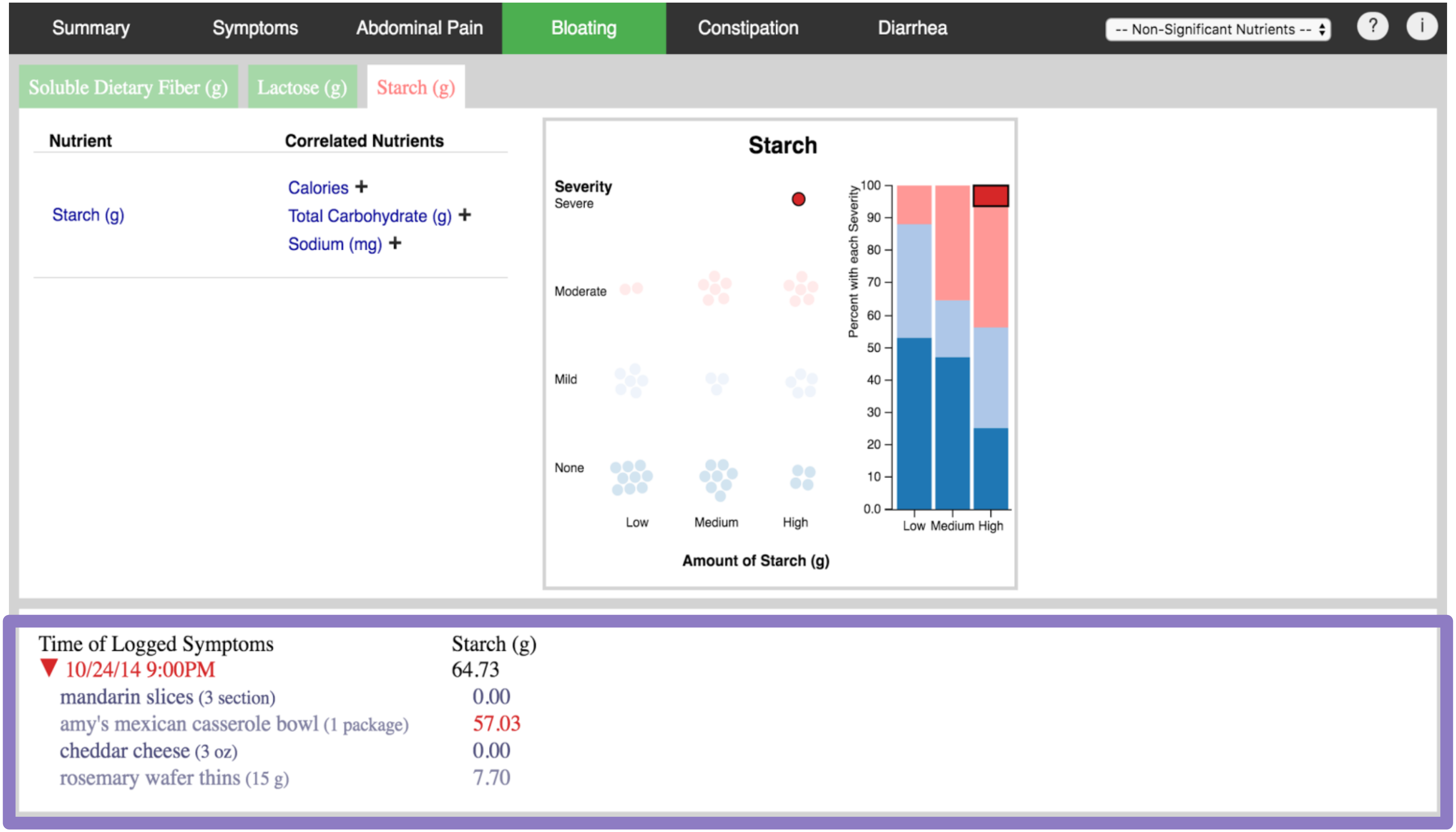
Nutrient	Correlated Nutrients
Starch (g)	Calories + Total Carbohydrate (g) + Sodium (mg) +

visualizing results: bubble and bar chart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Abdominal Pain
Bloating
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-- Non-Significant Nutrients --
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Mild
None
Low
Medium
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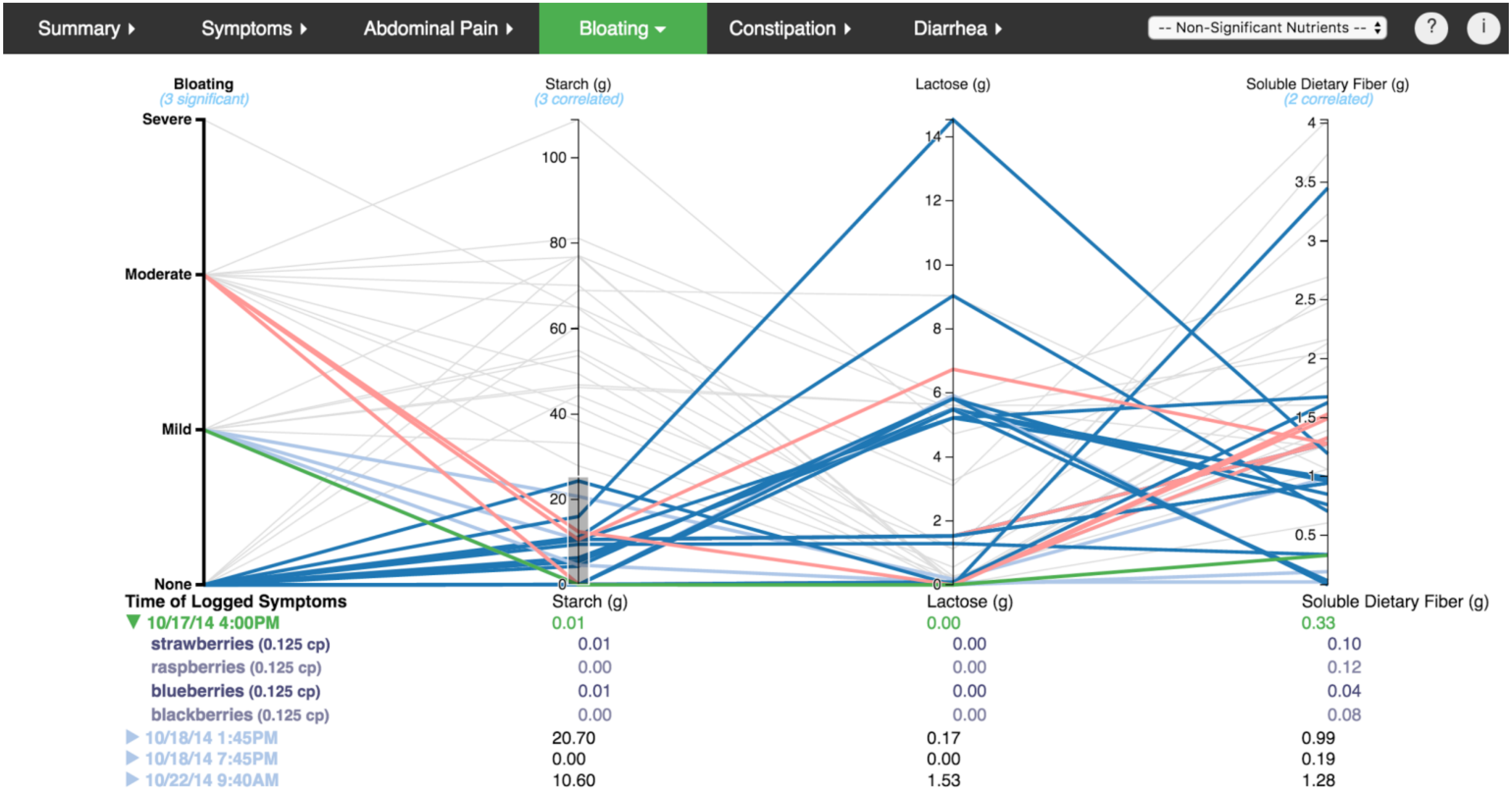
Amount of Starch (g)
Percent with each Severity
100
90
80
70
60
50
40
30
20
10
0.0
Low
Medium
High

Nutrient	Correlated Nutrients
Starch (g)	Calories + Total Carbohydrate (g) + Sodium (mg) +

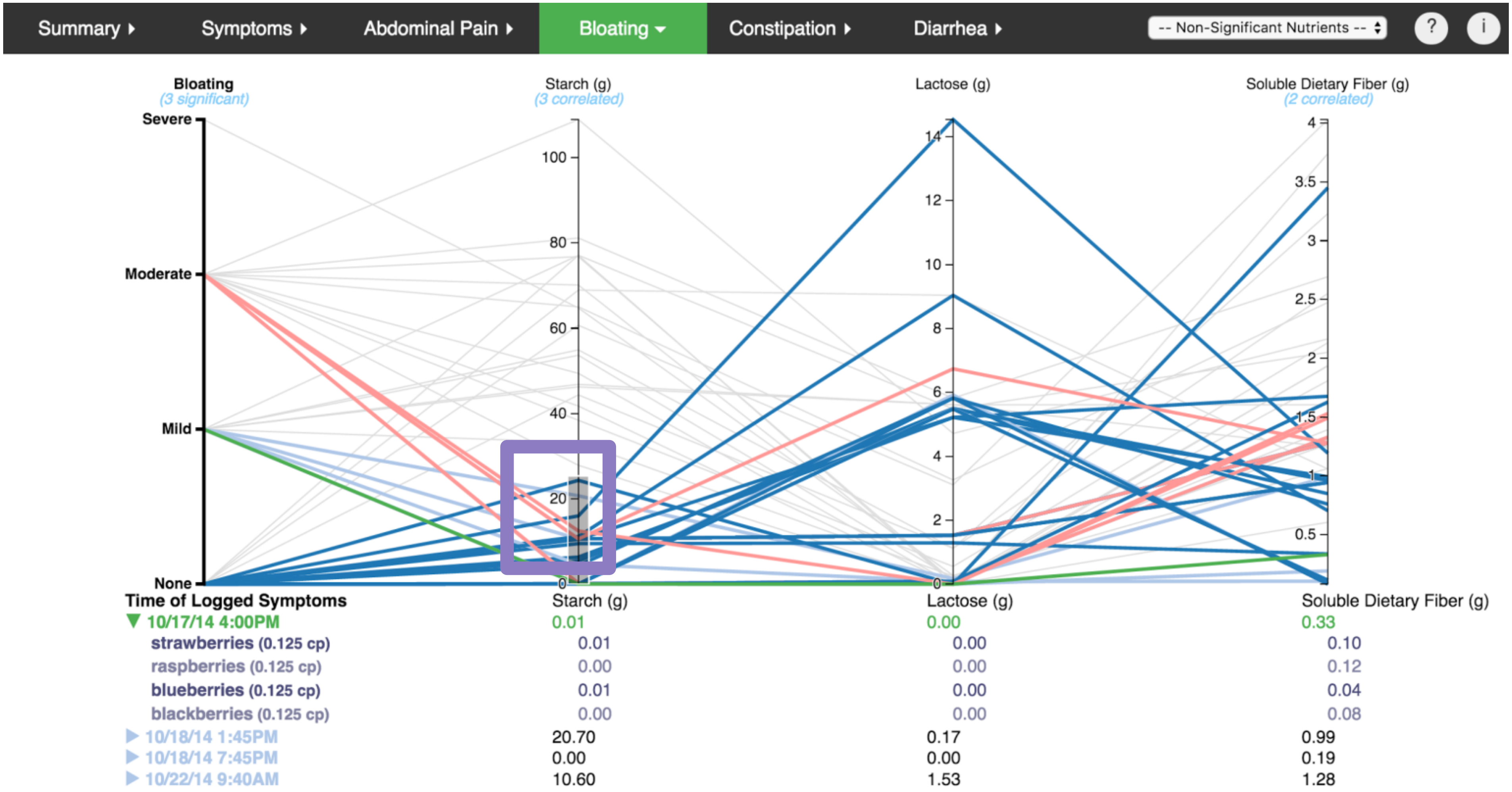
Time of Logged Symptoms	Starch (g)
▼ 10/24/14 9:00PM	64.73
mandarin slices (3 section)	0.00
amy's mexican casserole bowl (1 package)	57.03
cheddar cheese (3 oz)	0.00
rosemary wafer thins (15 g)	7.70

visualizing results: parallel coordinates plot


Summary ▸
Symptoms ▸
Abdominal Pain ▸
Bloating ▾
Constipation ▸
Diarrhea ▸
-- Non-Significant Nutrients --
?
i
Bloating
(3 significant)
Severe
Moderate
Mild
None
Starch (g)
(3 correlated)
100
80
60
40
20
0
Lactose (g)
14
12
10
8
6
4
2
0
Soluble Dietary Fiber (g)
(2 correlated)
4
3.5
3
2.5
2
1.5
1
0.5

Time of Logged Symptoms	Starch (g)	Lactose (g)	Soluble Dietary Fiber (g)
▼ 10/17/14 4:00PM	0.01	0.00	0.33
strawberries (0.125 cp)	0.01	0.00	0.10
raspberries (0.125 cp)	0.00	0.00	0.12
blueberries (0.125 cp)	0.01	0.00	0.04
blackberries (0.125 cp)	0.00	0.00	0.08
▶ 10/18/14 1:45PM	20.70	0.17	0.99
▶ 10/18/14 7:45PM	0.00	0.00	0.19
▶ 10/22/14 9:40AM	10.60	1.53	1.28

visualizing results: parallel coordinates plot


Summary ▸
Symptoms ▸
Abdominal Pain ▸
Bloating ▾
Constipation ▸
Diarrhea ▸
-- Non-Significant Nutrients --
?
i
Bloating
(3 significant)
Severe
Moderate
Mild
None
Starch (g)
(3 correlated)
100
80
60
40
20
0
Lactose (g)
14
12
10
8
6
4
2
0
Soluble Dietary Fiber (g)
(2 correlated)
4
3.5
3
2.5
2
1.5
1
0.5
0

Time of Logged Symptoms	Starch (g)	Lactose (g)	Soluble Dietary Fiber (g)
▼ 10/17/14 4:00PM	0.01	0.00	0.33
strawberries (0.125 cp)	0.01	0.00	0.10
raspberries (0.125 cp)	0.00	0.00	0.12
blueberries (0.125 cp)	0.01	0.00	0.04
blackberries (0.125 cp)	0.00	0.00	0.08
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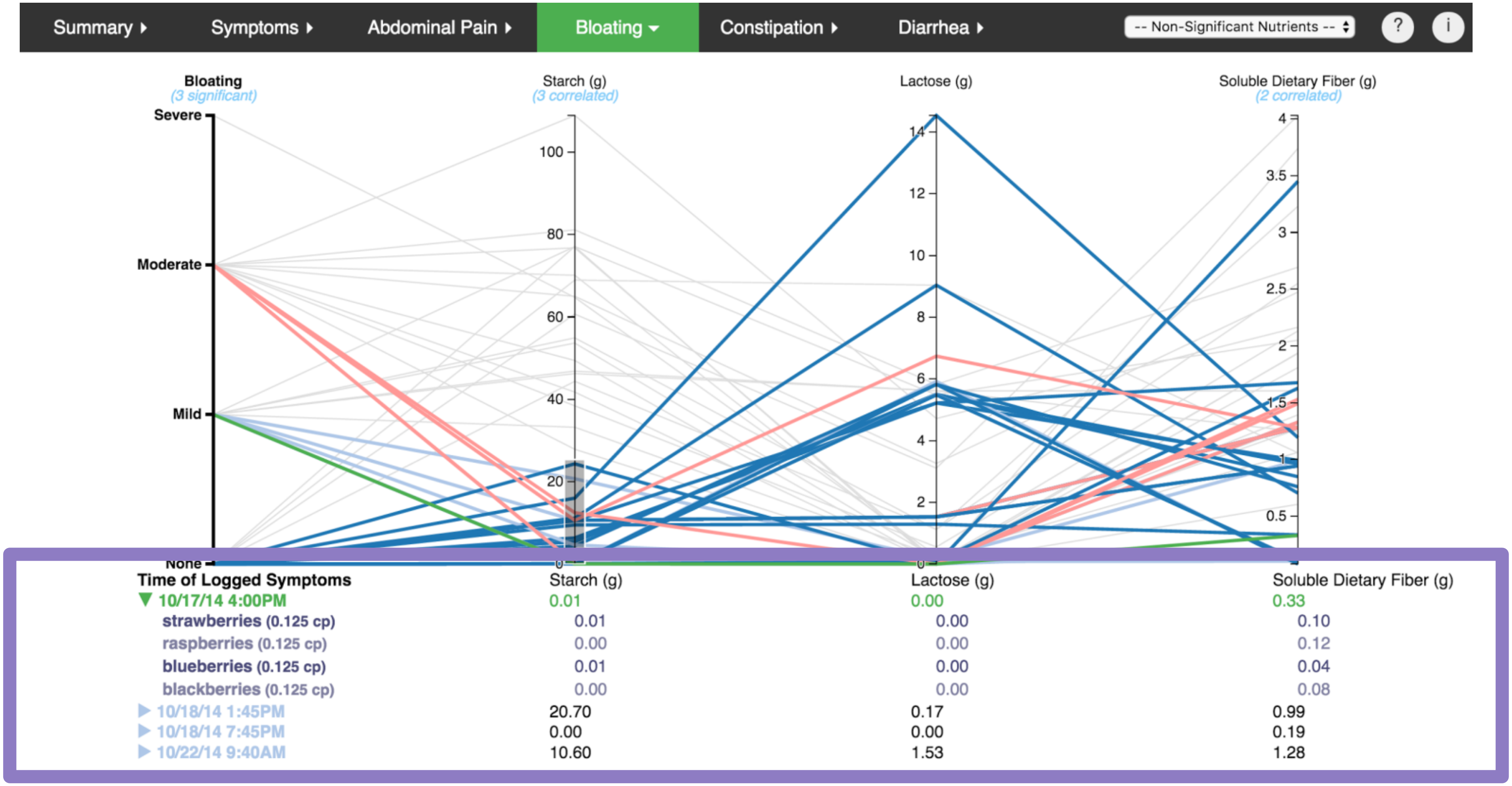
visualizing results: parallel coordinates plot


Summary ▸
Symptoms ▸
Abdominal Pain ▸
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Constipation ▸
Diarrhea ▸
-- Non-Significant Nutrients --
?
i
Bloating
(3 significant)
Severe
Moderate
Mild
None
Starch (g)
(3 correlated)
100
80
60
40
20
0
Lactose (g)
14
12
10
8
6
4
2
0
Soluble Dietary Fiber (g)
(2 correlated)
4
3.5
3
2.5
2
1.5
1
0.5
0

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▼ 10/17/14 4:00PM	0.01	0.00	0.33
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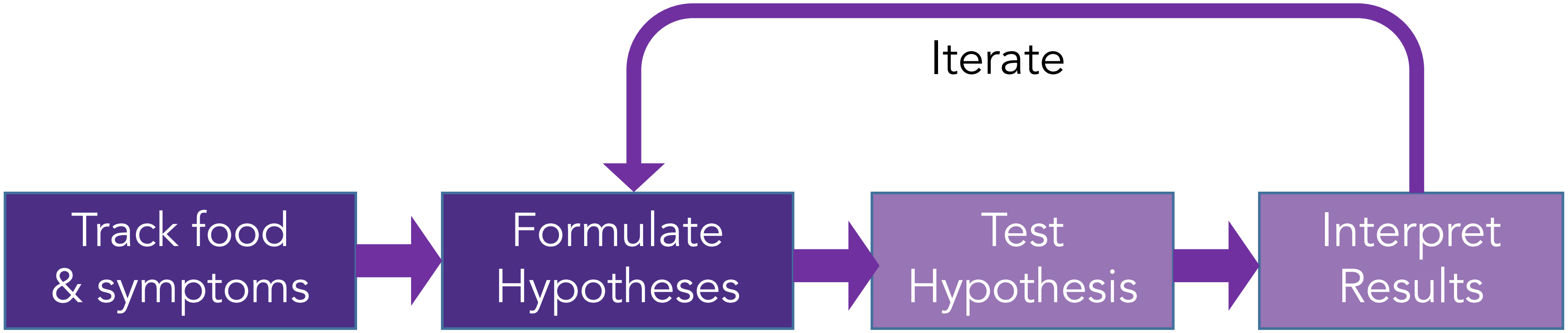
blackberries (0.125 cp)	0.00	0.00	0.08
▶ 10/18/14 1:45PM	20.70	0.17	0.99
▶ 10/18/14 7:45PM	0.00	0.00	0.19
▶ 10/22/14 9:40AM	10.60	1.53	1.28

visualizations facilitated collaboration

- Greatly preferred over analyzing paper diaries; reduced burden of synthesis.
- At least initially, patients and providers had concerns about data and results, but these were generally resolved through collaboration.
- Very different preferences for *how* to use these tools.

recasting self-tracking

- Hypothesis formation based on journals
- Rethinking trigger detection to rigorously test hypotheses while reducing patient and provider burden.


Iterate
Track food & symptoms
Formulate Hypotheses
Test Hypothesis
Interpret Results

J. Schroeder, J Hoffswell, CF Chung, J Fogarty, SA Munson, J Zia. *CSCW 2017.*
Supporting Patient-Provider Collaboration to Identify Individual Triggers using Food and Symptom Journals.

recasting self-tracking

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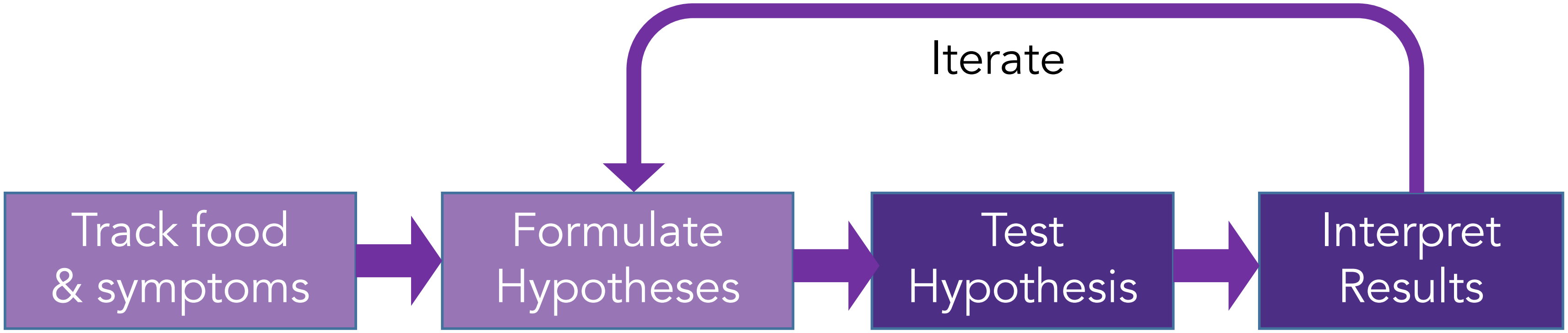
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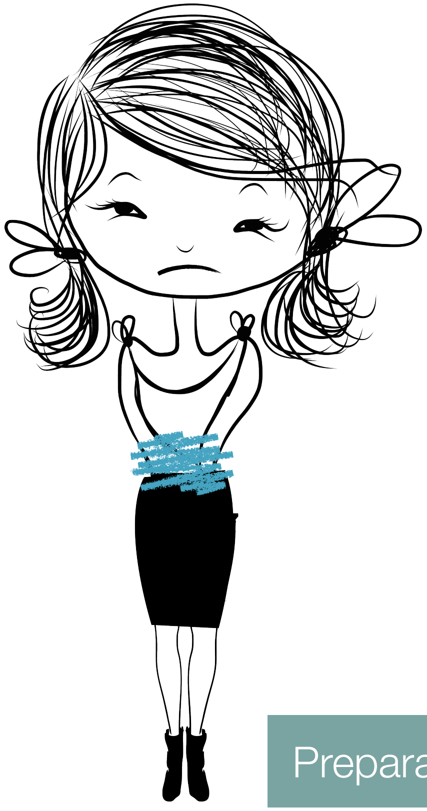
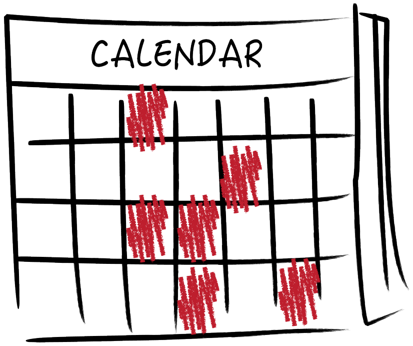
R Karkar, J Zia, R Vilardaga, SR Mishra, J Fogarty, SA Munson, JA Kientz. *JAMIA 2016.*
A framework for self-experimentation in personalized health.

a new process for Jane





Severe Symptoms

Missing Work

Needs Help

Preparation

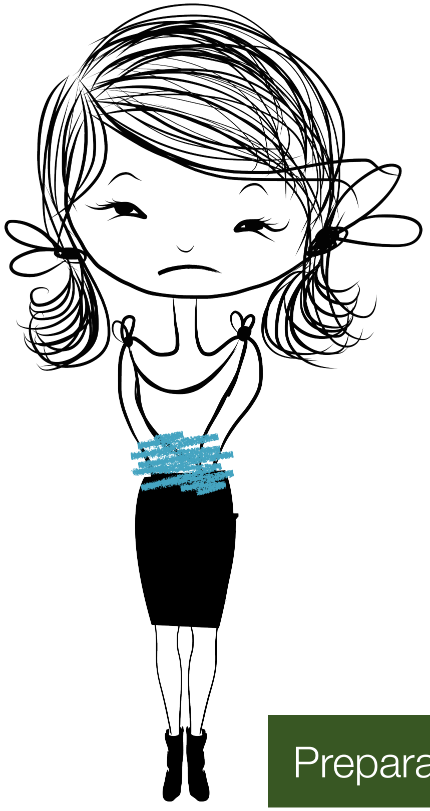
Collection

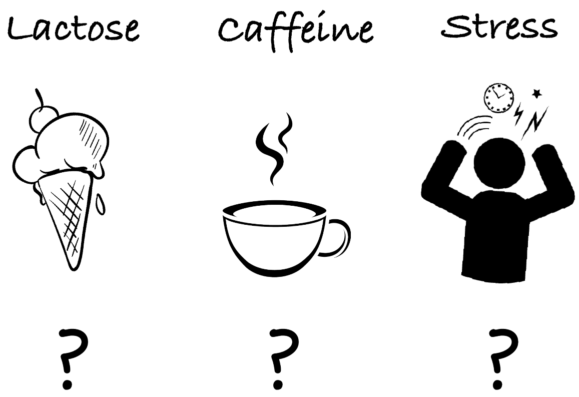
Integration

Reflection

Action

Jane’s personal hypotheses




Lactose
Caffeine
Stress
?
?
?

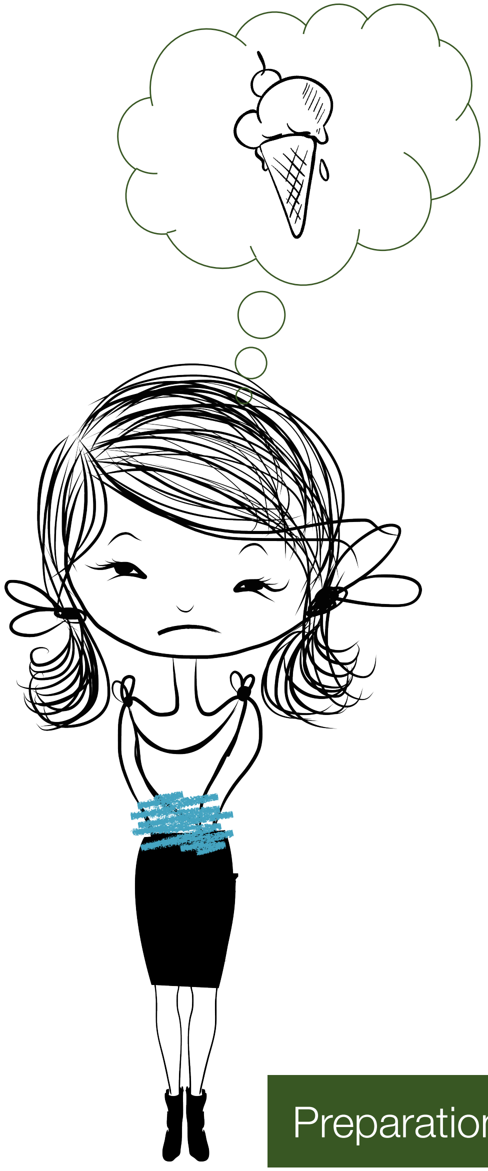
Possible Triggers

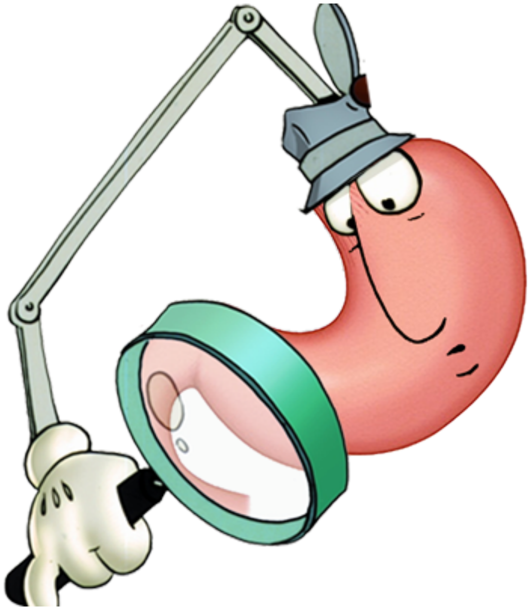
- Lactose
- Caffeine
- Stress

Confounding Effect

Preparation | Collection | Integration | Reflection | Action

designing a self-experiment





Preparation

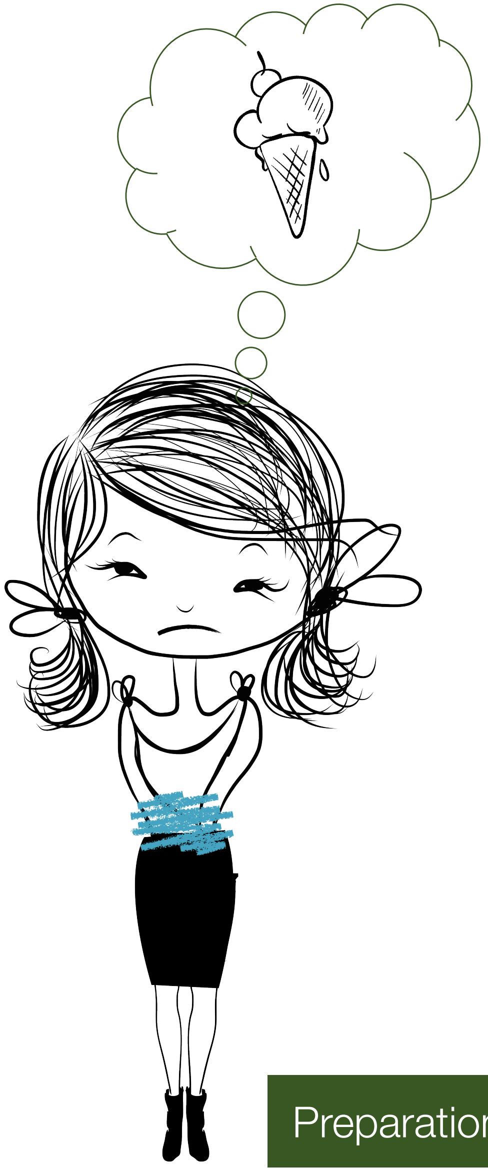
Collection

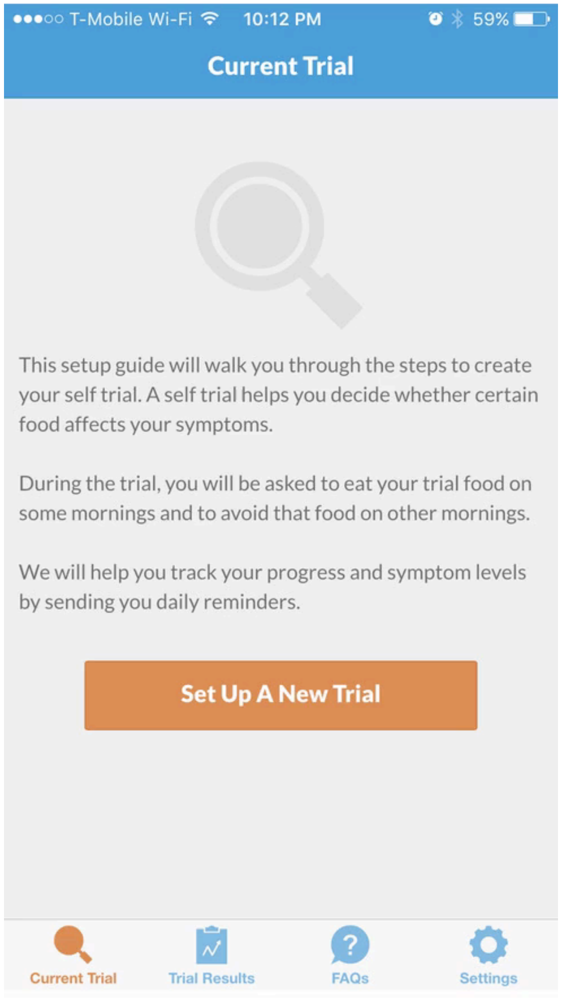
Integration

Reflection

Action

designing a self-experiment





●●●○○ T-Mobile Wi-Fi
10:12 PM
59%
Current Trial

This setup guide will walk you through the steps to create your self trial. A self trial helps you decide whether certain food affects your symptoms.

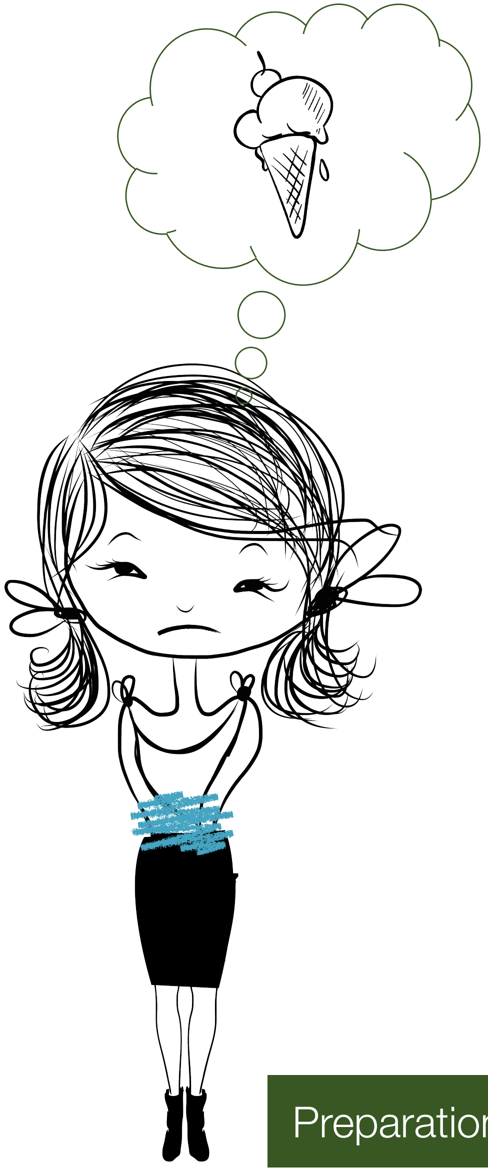
During the trial, you will be asked to eat your trial food on some mornings and to avoid that food on other mornings.

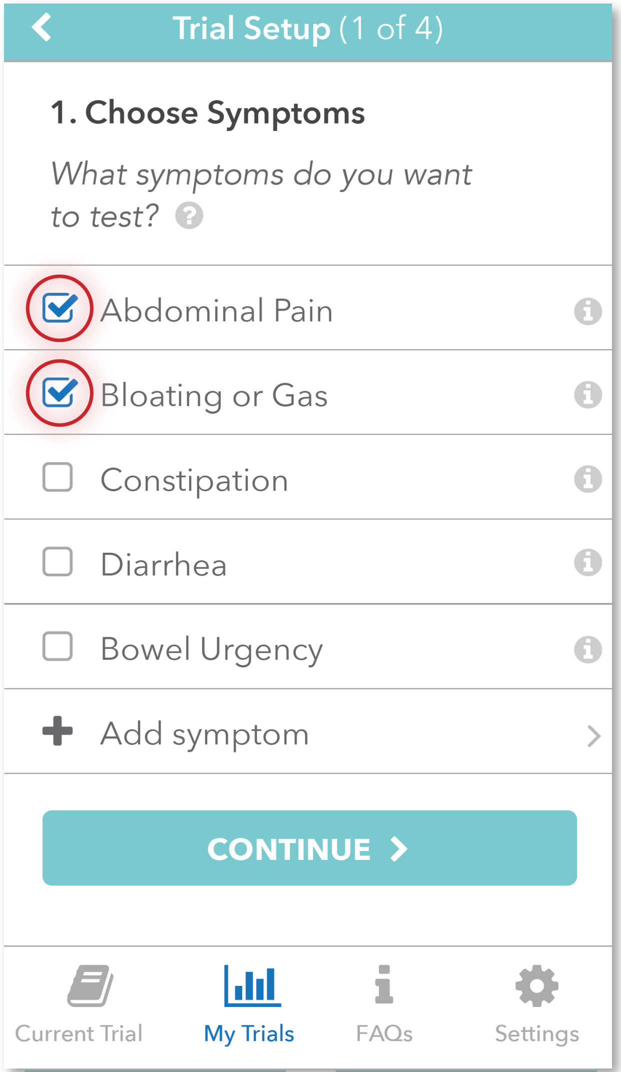
We will help you track your progress and symptom levels by sending you daily reminders.

Set Up A New Trial
Current Trial
Trial Results
FAQs
Settings

Preparation   Collection   Integration   Reflection   Action

designing a self-experiment



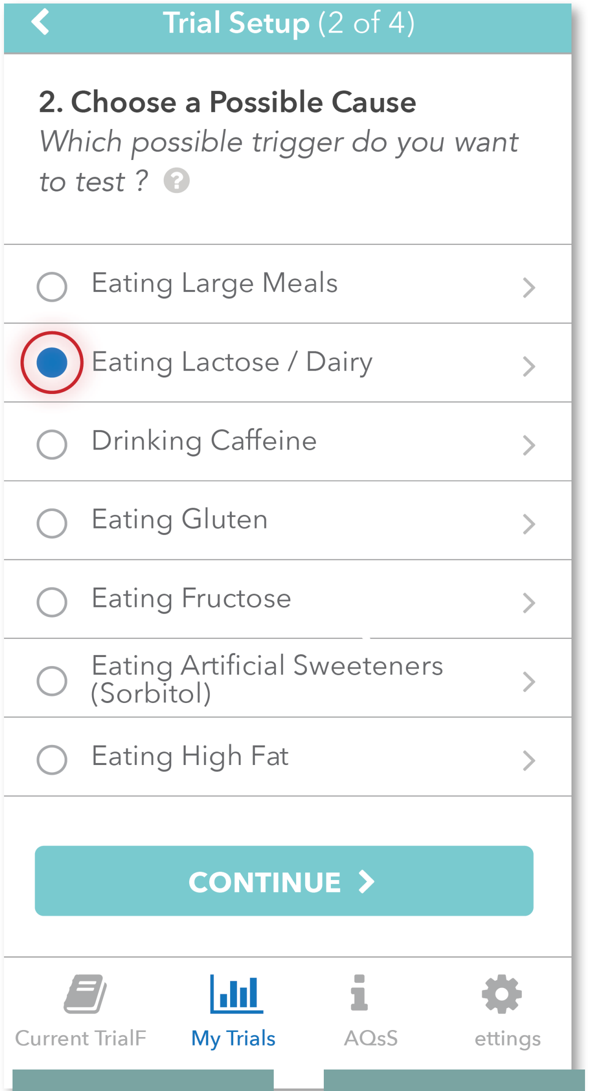

Trial Setup (1 of 4)

1. Choose Symptoms

What symptoms do you want to test?

- ☑ Abdominal Pain
- ☑ Bloating or Gas
- ☐ Constipation
- ☐ Diarrhea
- ☐ Bowel Urgency
- Add symptom

CONTINUE
Current Trial
My Trials
FAQs
Settings


Trial Setup (2 of 4)

2. Choose a Possible Cause

Which possible trigger do you want to test ?

- ○ Eating Large Meals
- ● Eating Lactose / Dairy
- ○ Drinking Caffeine
- ○ Eating Gluten
- ○ Eating Fructose
- ○ Eating Artificial Sweeteners (Sorbitol)
- ○ Eating High Fat

CONTINUE
Current TrialF
My Trials
AQsS
ettings

Preparation

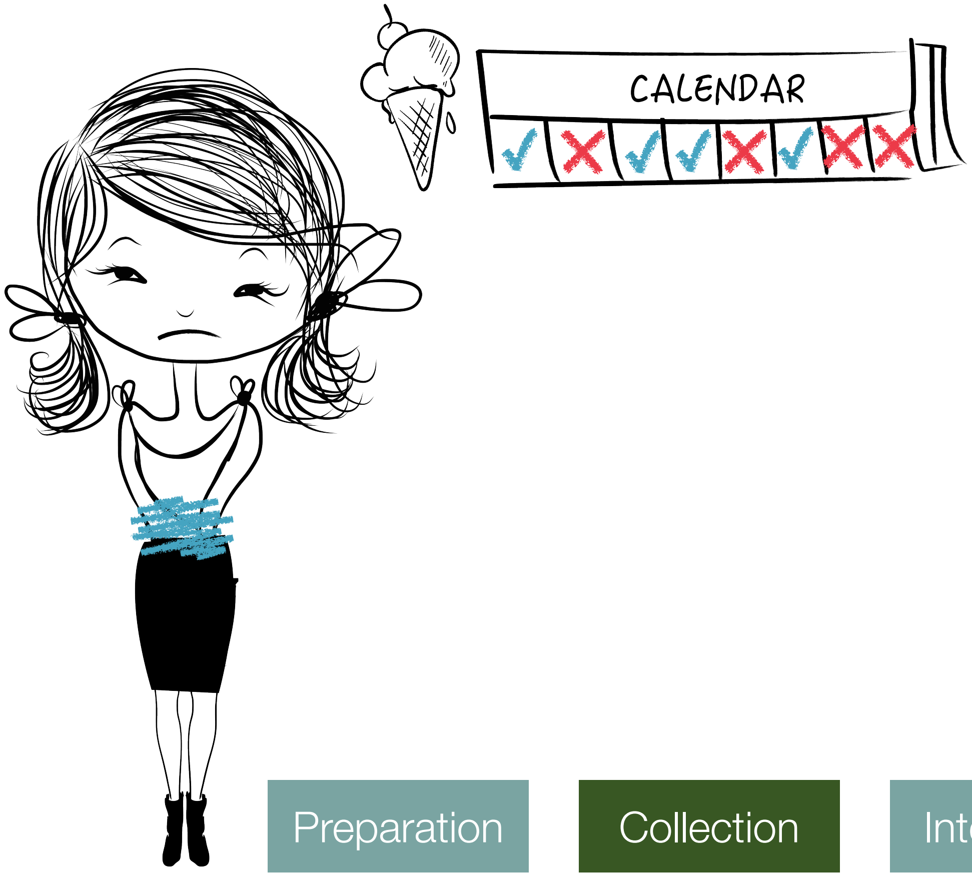
Collection

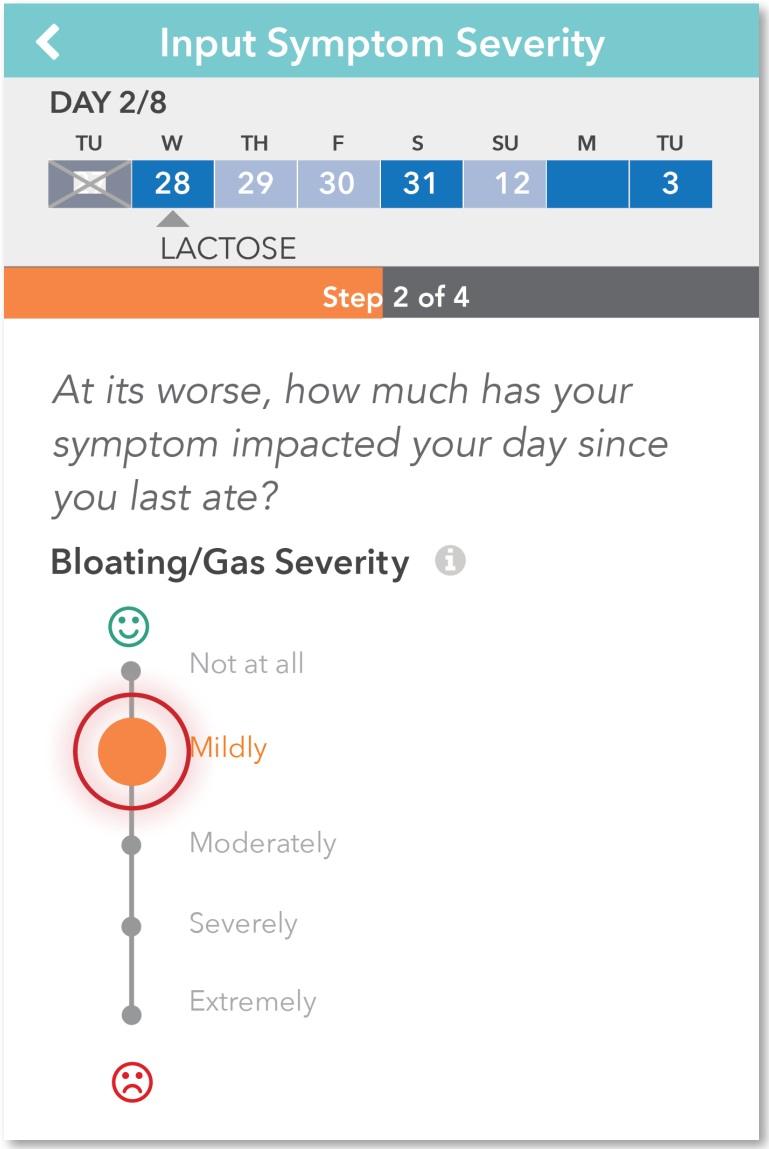
Integration

Reflection

Action

conducting the self-experiment





Input Symptom Severity

DAY 2/8

TU	W	TH	F	S	SU	M	TU
☒	28	29	30	31	12		3

LACTOSE

Step 2 of 4

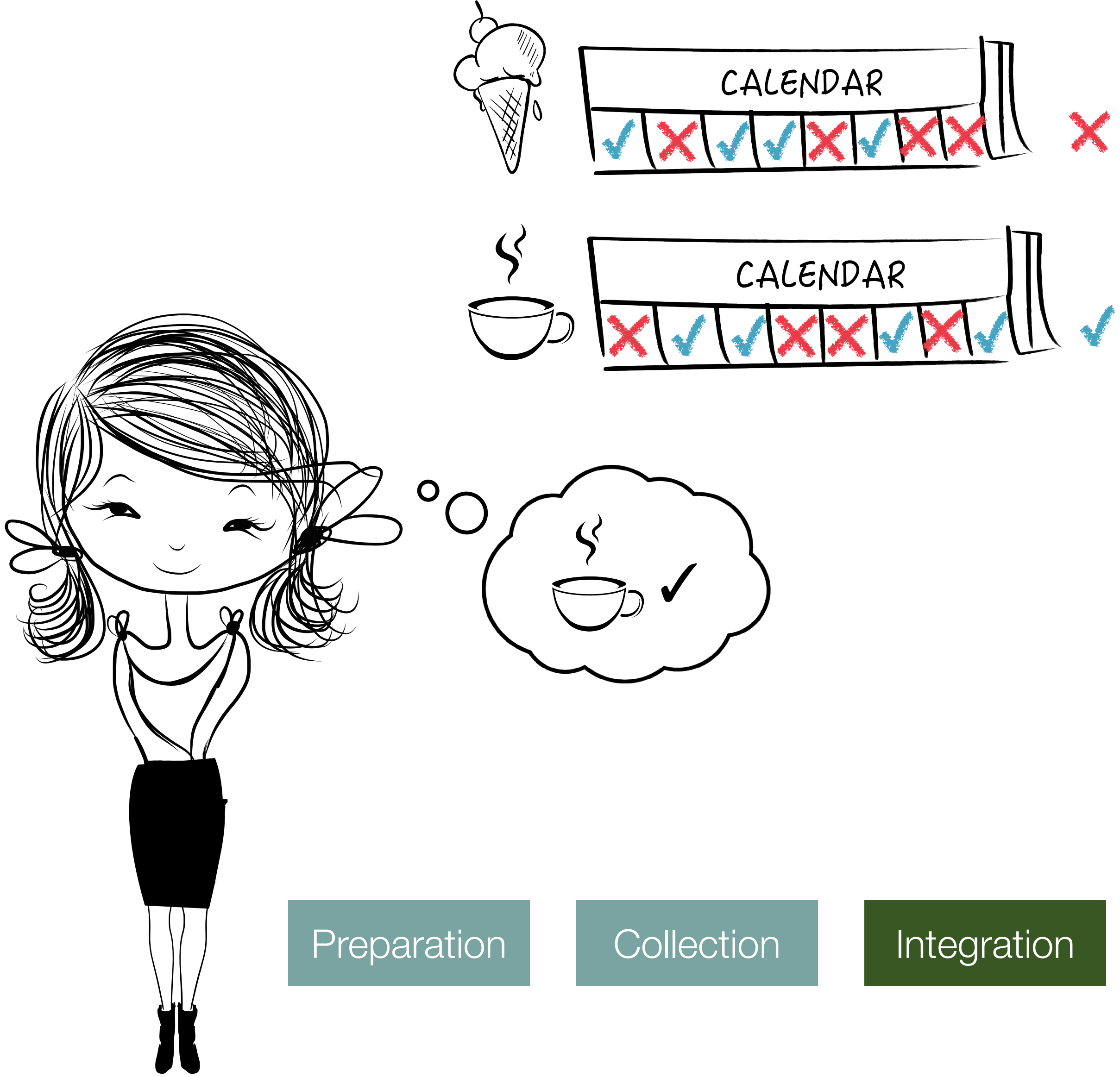
At its worse, how much has your symptom impacted your day since you last ate?

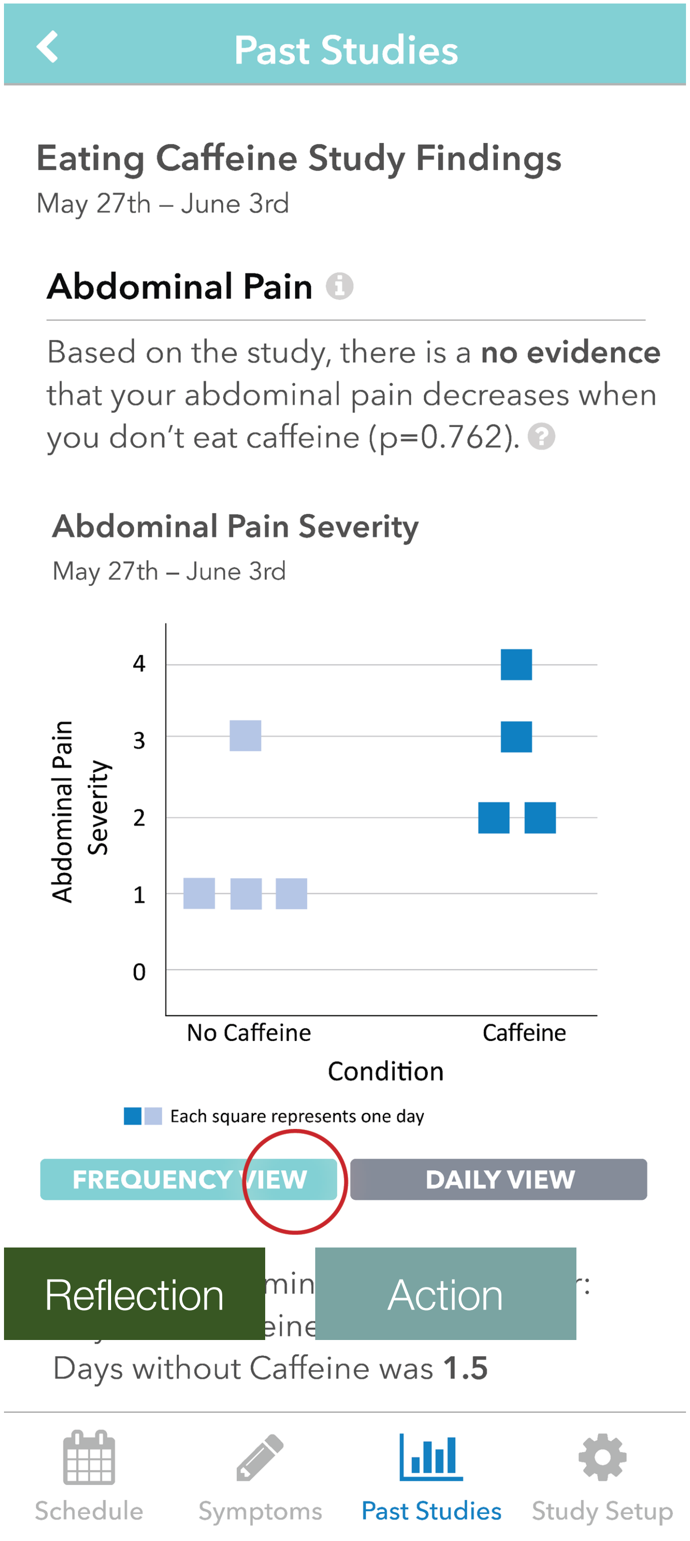
Bloating/Gas Severity

○ Not at all
● Mildly
○ Moderately
○ Severely
○ Extremely

Preparation | Collection | Integration | Reflection | Action

interpreting results


CALENDAR
CALENDAR



Past Studies

Eating Caffeine Study Findings

May 27th – June 3rd

Abdominal Pain

Based on the study, there is a **no evidence** that your abdominal pain decreases when you don't eat caffeine (p=0.762).

Abdominal Pain Severity

May 27th – June 3rd

Abdominal Pain Severity
4
3
2
1
0
No Caffeine
Caffeine
Condition
Each square represents one day
FREQUENCY VIEW
DAILY VIEW

min

eine

Days without Caffeine was **1.5**

Schedule
Symptoms
Past Studies
Study Setup

Preparation

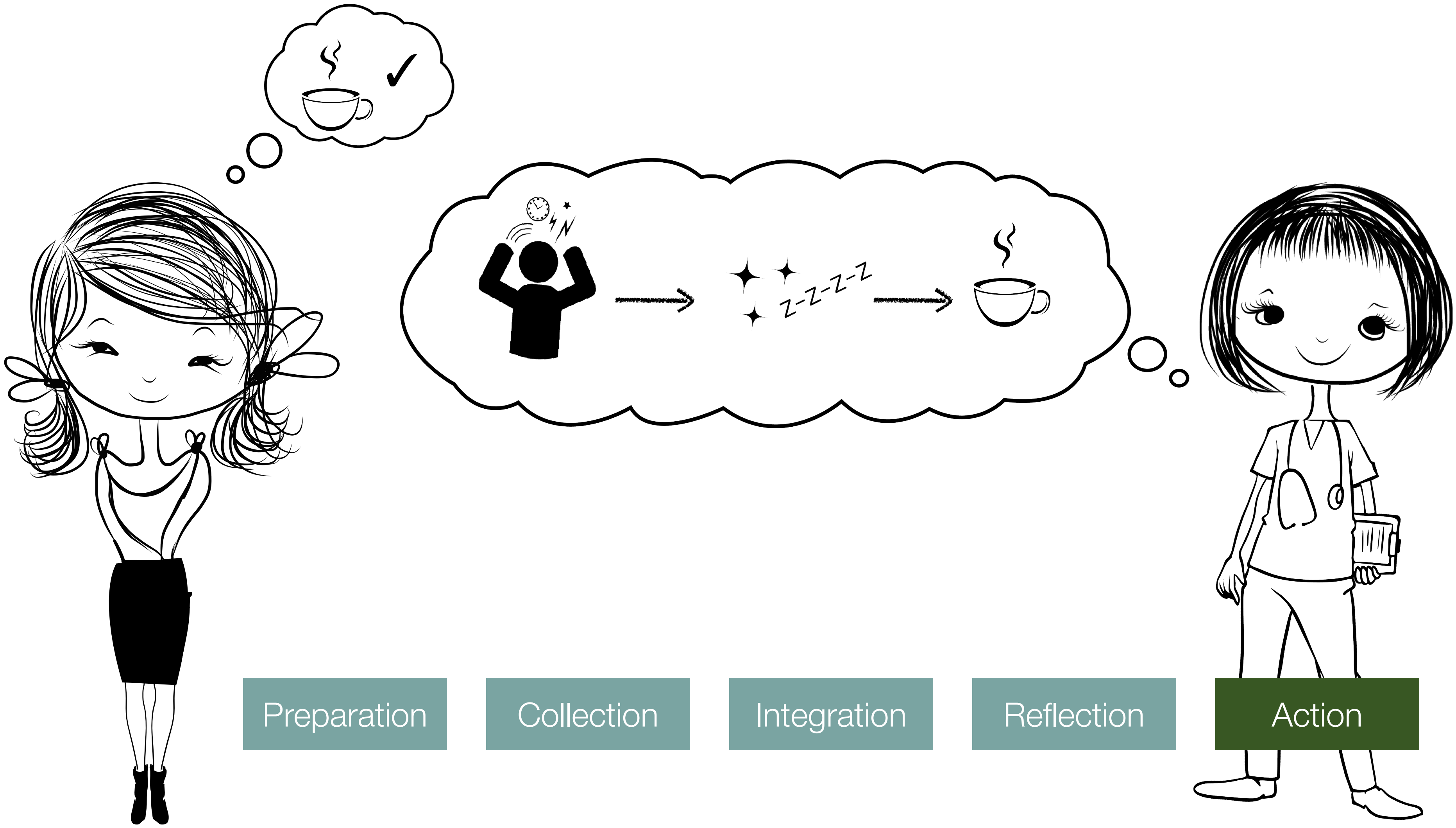
Collection

Integration

Reflection

Action

actionable answers



Preparation Collection Integration Reflection **Action**

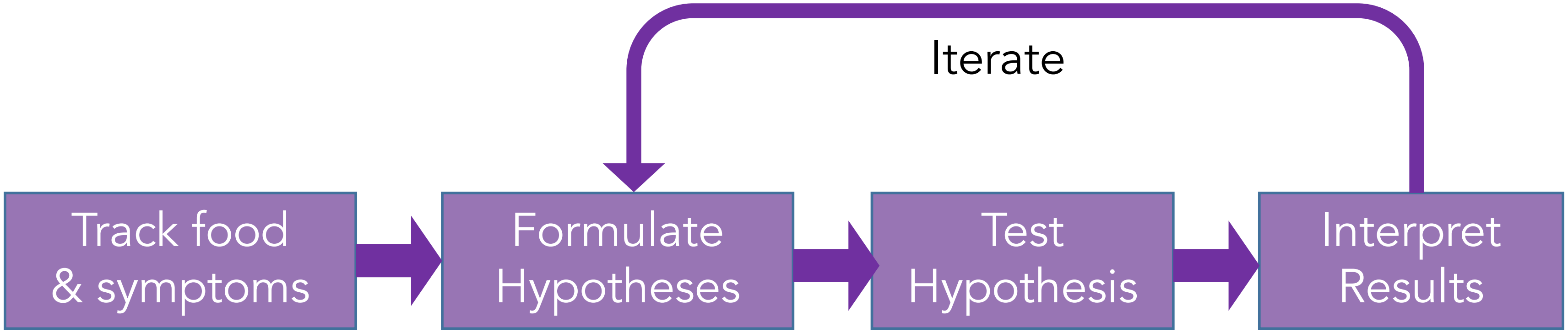
preliminary evaluation (15 person field study)

- High completion rate, low reported burden
- People found results valuable:
  - Valued design of controlled experiment
  - Relied on visual analysis much more than statistical analysis
- Rigor: participants were willing to accept and act on less than scientific standards, to better fit study into their lives.

Formulate Hypotheses → Test Hypothesis → Interpret Results

recasting self-tracking

- Hypothesis formation based on journals
- Rethinking trigger detection to rigorously test hypotheses while reducing patient and provider burden.



Iterate

Track food & symptoms

Formulate Hypotheses

Test Hypothesis

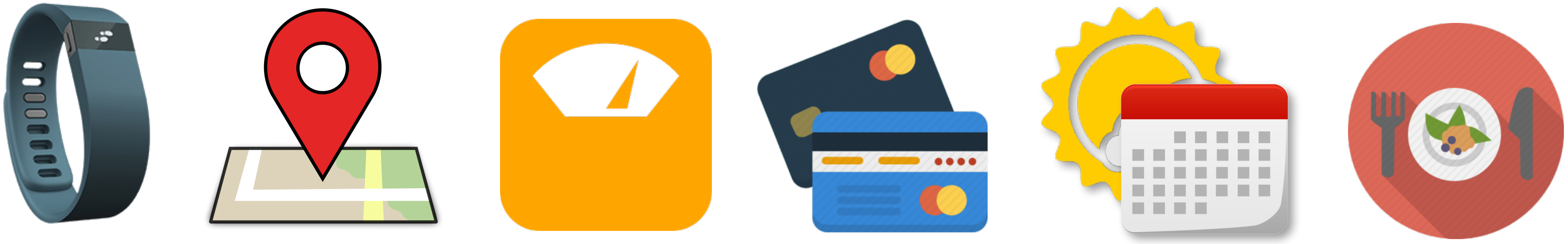
Interpret Results

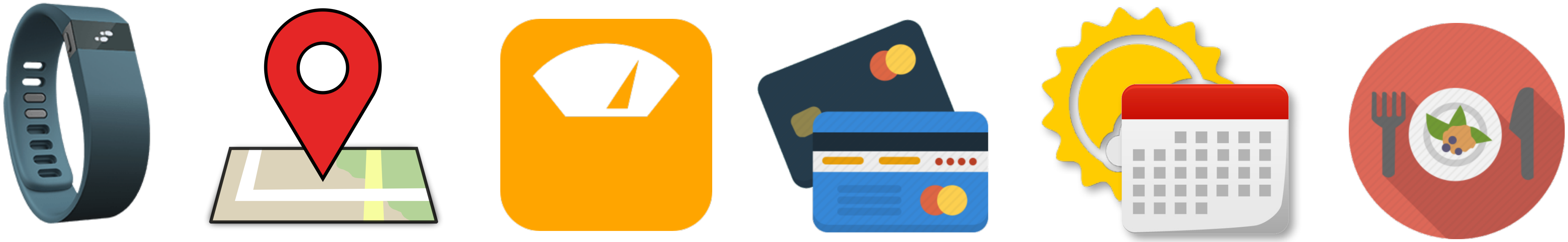
Provide people with scaffolding, reduction, and focus in the process, not just the output.

Assumption #4

More data are better

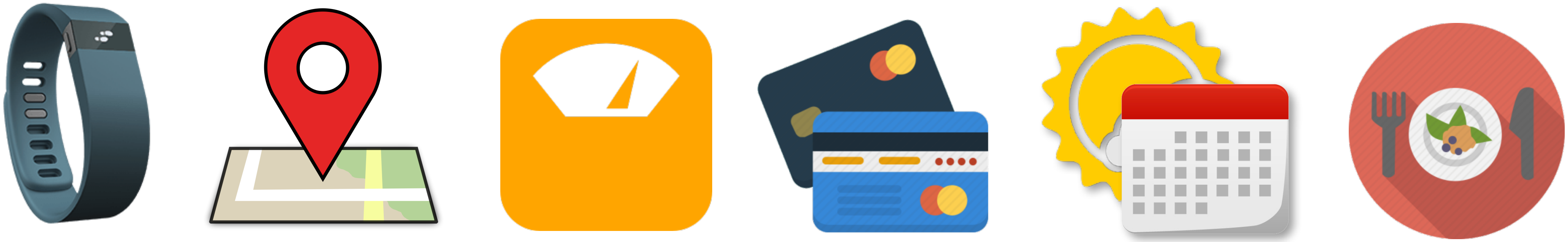
OMRON
Walking style
10258
Steps
12:03
SET
MEMO
MODE
EVENT





A wealth of information creates a poverty of attention, and a need to allocate that attention efficiently among the overabundance of information sources that might consume it.

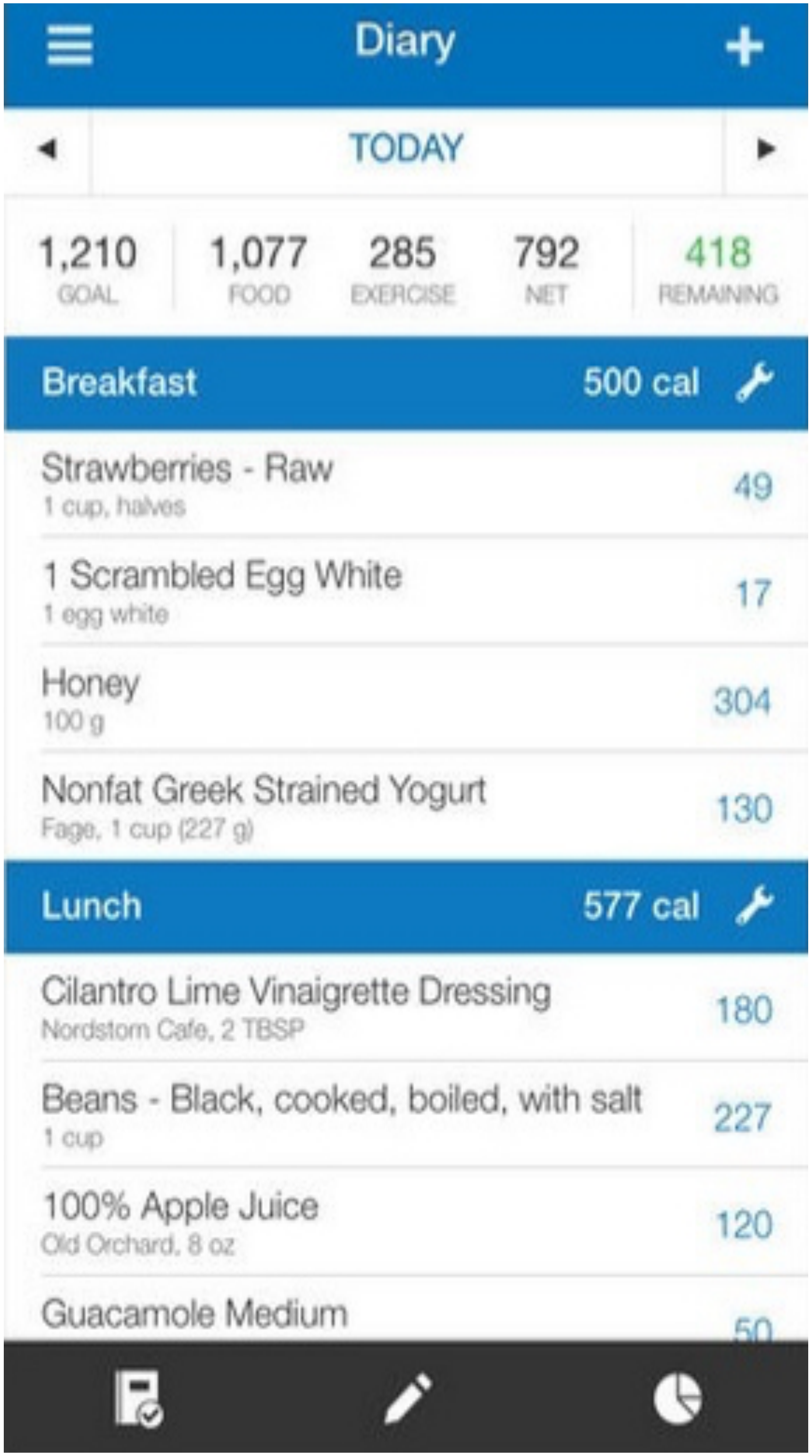
- Herbert Simon



Unanalyzed data are
worse than no data.

- Margaret Mead

DATA FETISH

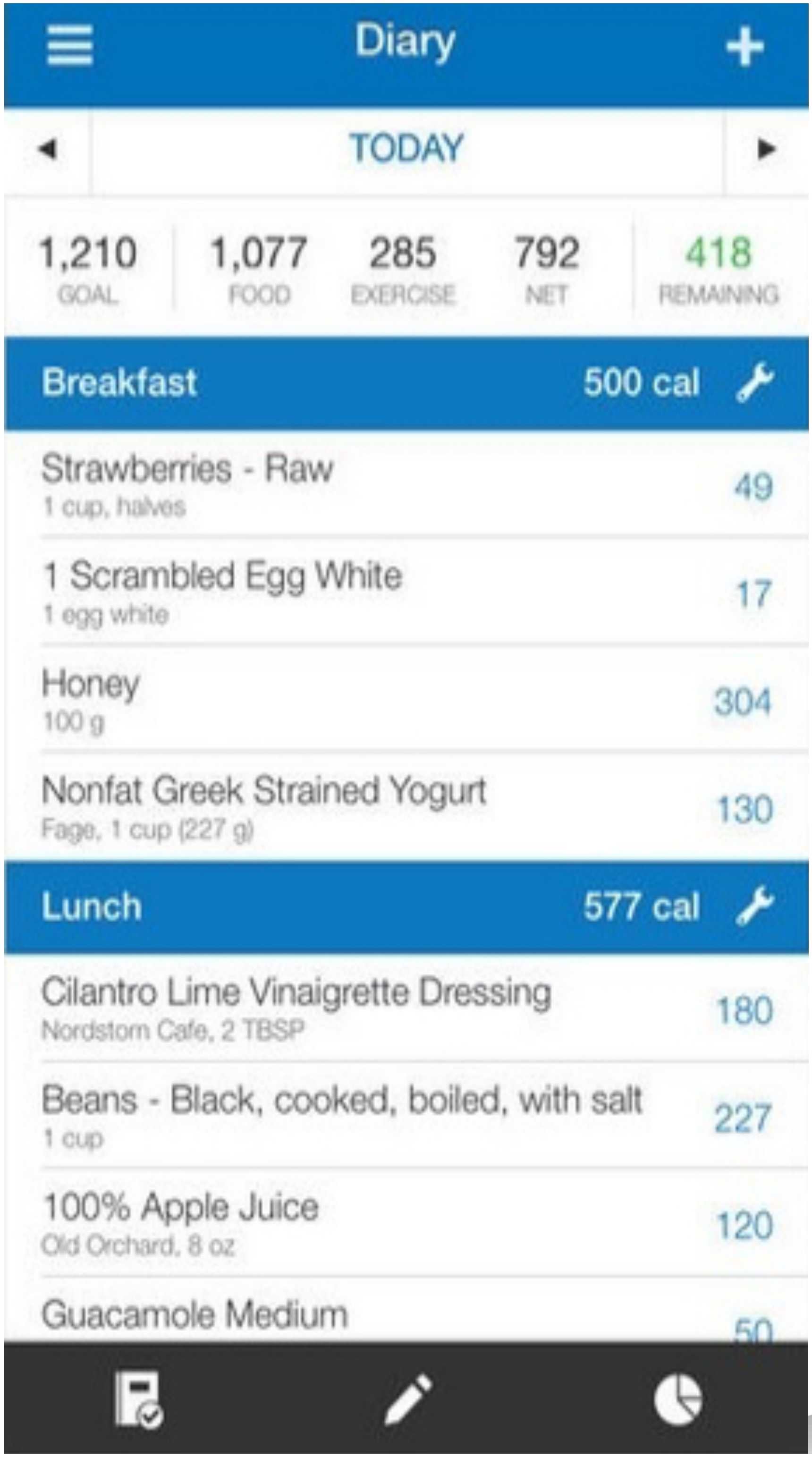


1,210	1,077	285	792	418
GOAL	FOOD	EXERCISE	NET	REMAINING

Breakfast	500 cal
Strawberries - Raw 1 cup, halves	49
1 Scrambled Egg White 1 egg white	17
Honey 100 g	304
Nonfat Greek Strained Yogurt Fage, 1 cup (227 g)	130

Lunch	577 cal
Cilantro Lime Vinaigrette Dressing Nordstom Cafe, 2 TBSP	180
Beans - Black, cooked, boiled, with salt 1 cup	227
100% Apple Juice Old Orchard, 8 oz	120
Guacamole Medium	50

Food journals can help people eat healthier and tune their diet.


Diary
+
◂ TODAY ▸

1,210	1,077	285	792	418
GOAL	FOOD	EXERCISE	NET	REMAINING

Breakfast	500 cal
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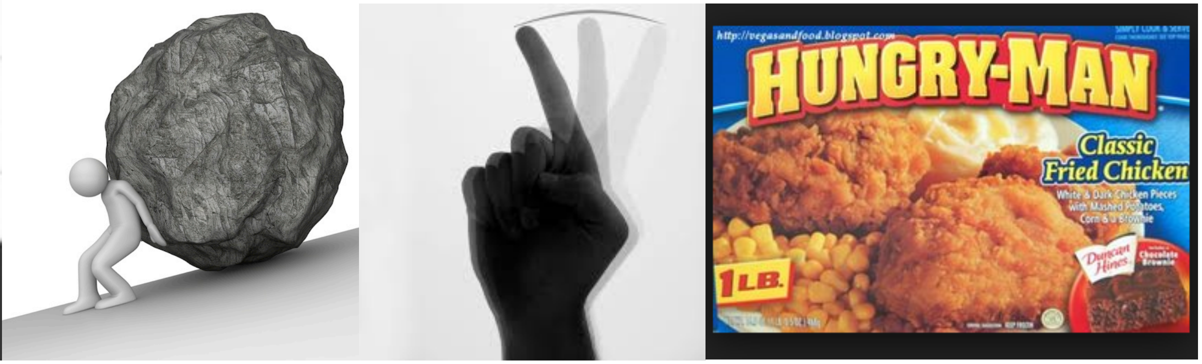
Guacamole Medium	50

Food journals can help people eat healthier and tune their diet.

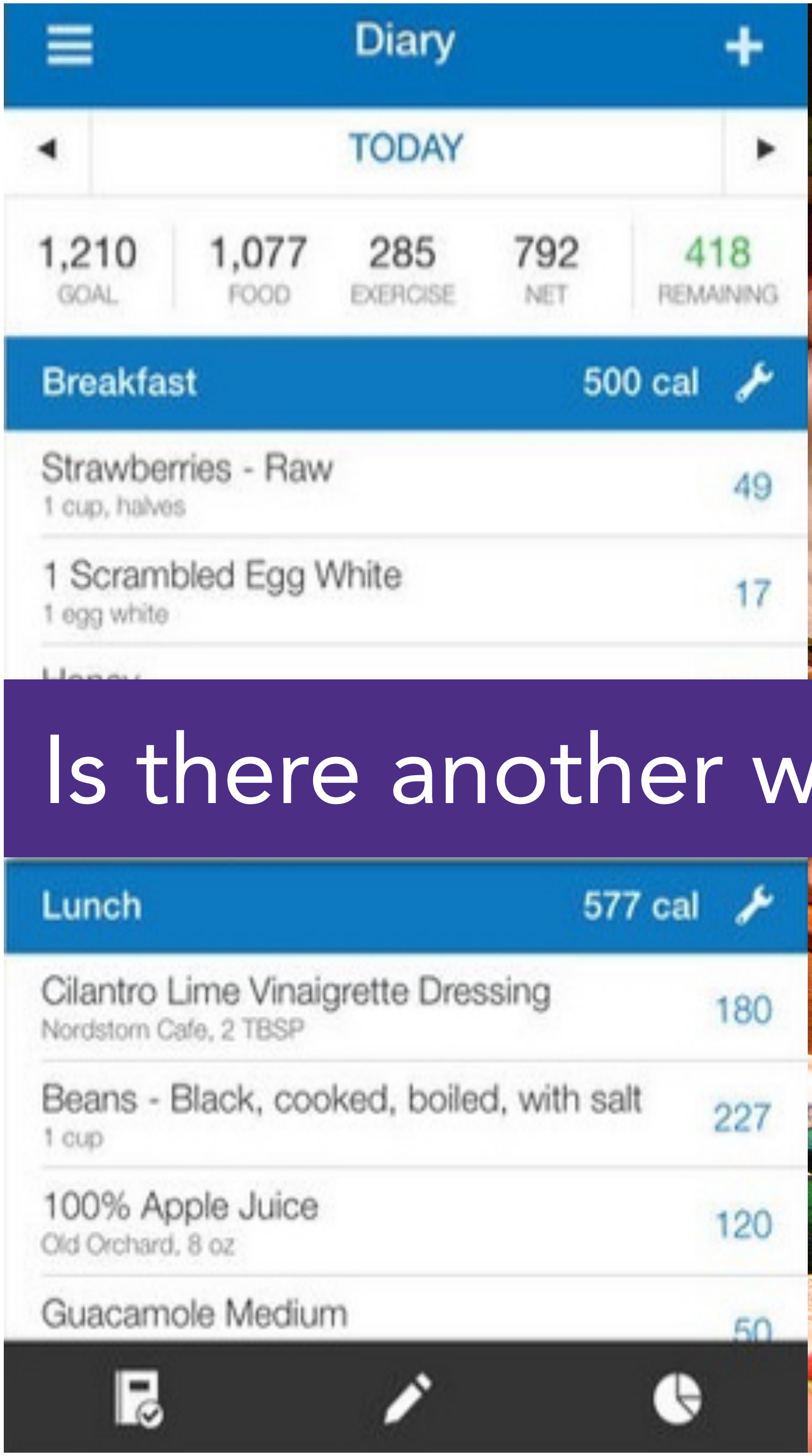
but...

- they are high-burden
- they can feel judgy
- they can nudge people to eat things that are easier to log.


http://vegasandfood.blogspot.com
HUNGRY-MAN
Classic Fried Chicken
White & Dark Chicken Pieces with Mashed Potatoes, Corn & a Brownie
1 LB.
Duncan Hines
Chocolate Brownie

flickr: Timothy Vollmer

Is there another way?



TODAY

1,210	1,077	285	792	418
GOAL	FOOD	EXERCISE	NET	REMAINING

Breakfast 500 cal

Strawberries - Raw 1 cup, halves	49
1 Scrambled Egg White 1 egg white	17

Lunch 577 cal

Cilantro Lime Vinaigrette Dressing Nordstom Cafe, 2 TBSP	180
Beans - Black, cooked, boiled, with salt 1 cup	227
100% Apple Juice Old Orchard, 8 oz	120
Guacamole Medium	50

flickr: Timothy Vollmer

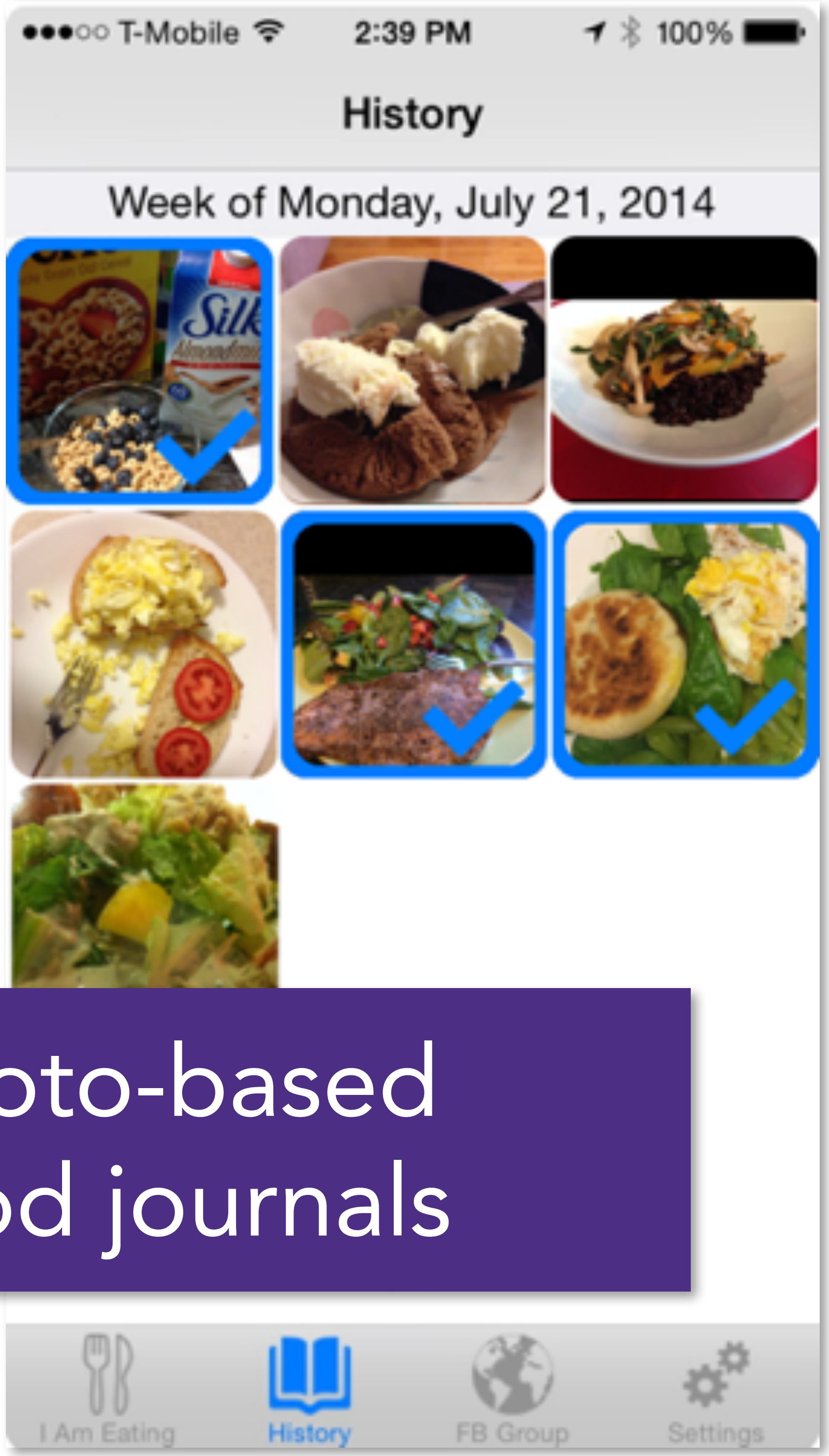
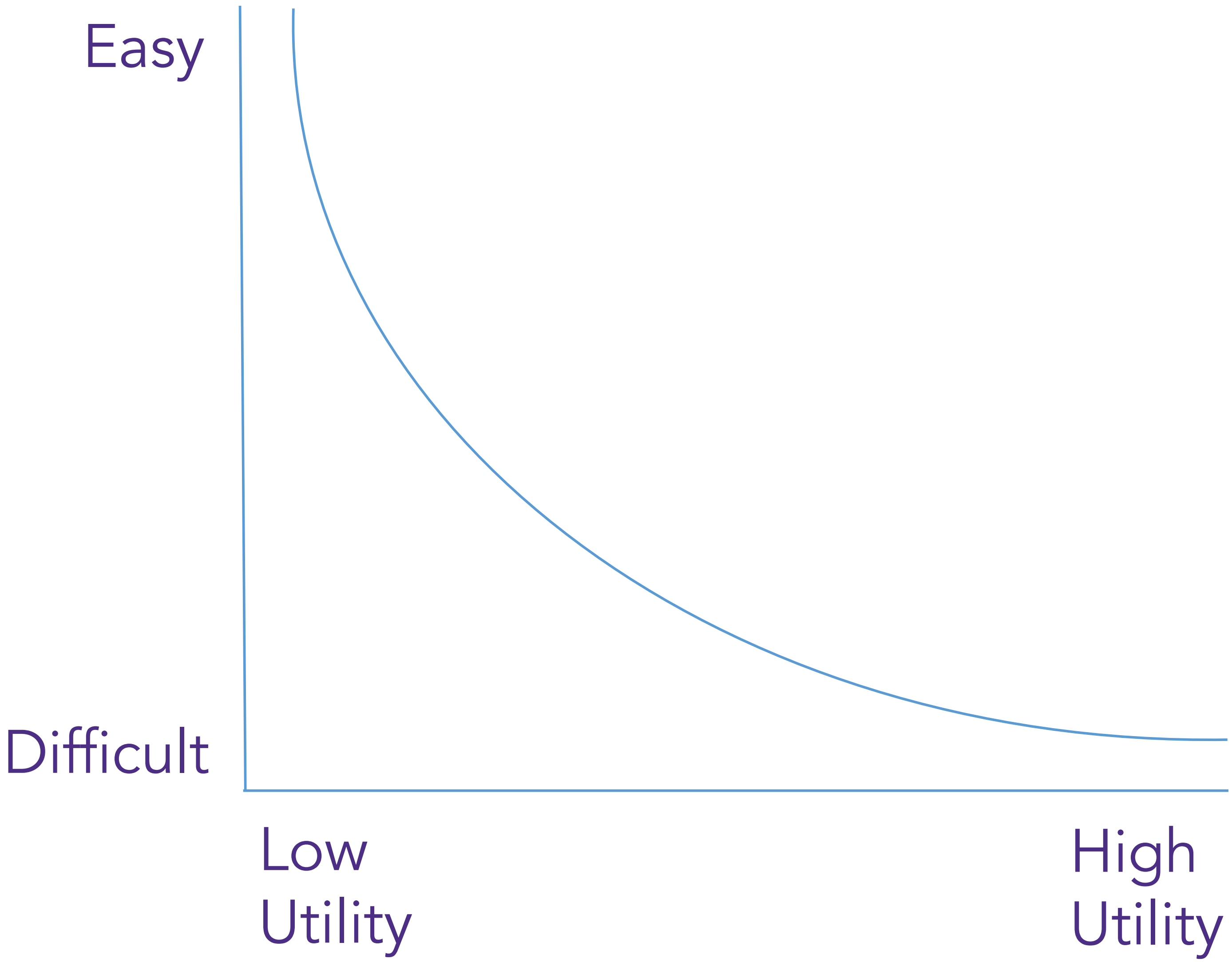

T-Mobile
2:39 PM
100%
History
Week of Monday, July 21, 2014
Silk
I Am Eating
History
FB Group
Settings

Photo-based food journals

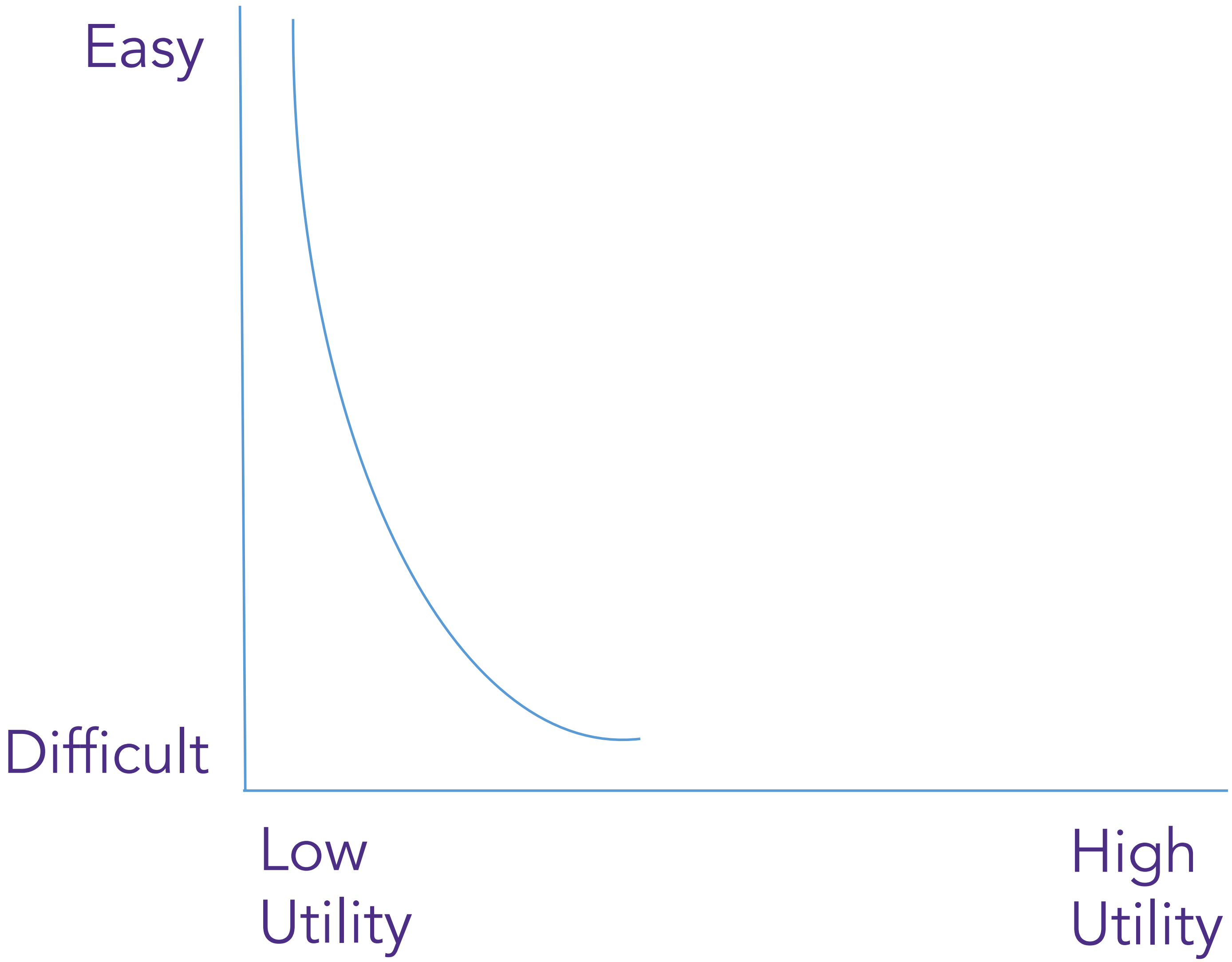
Lower burden than traditional food journals, without many of the "negative nudges."

A Trade-Off Between Effort and Utility



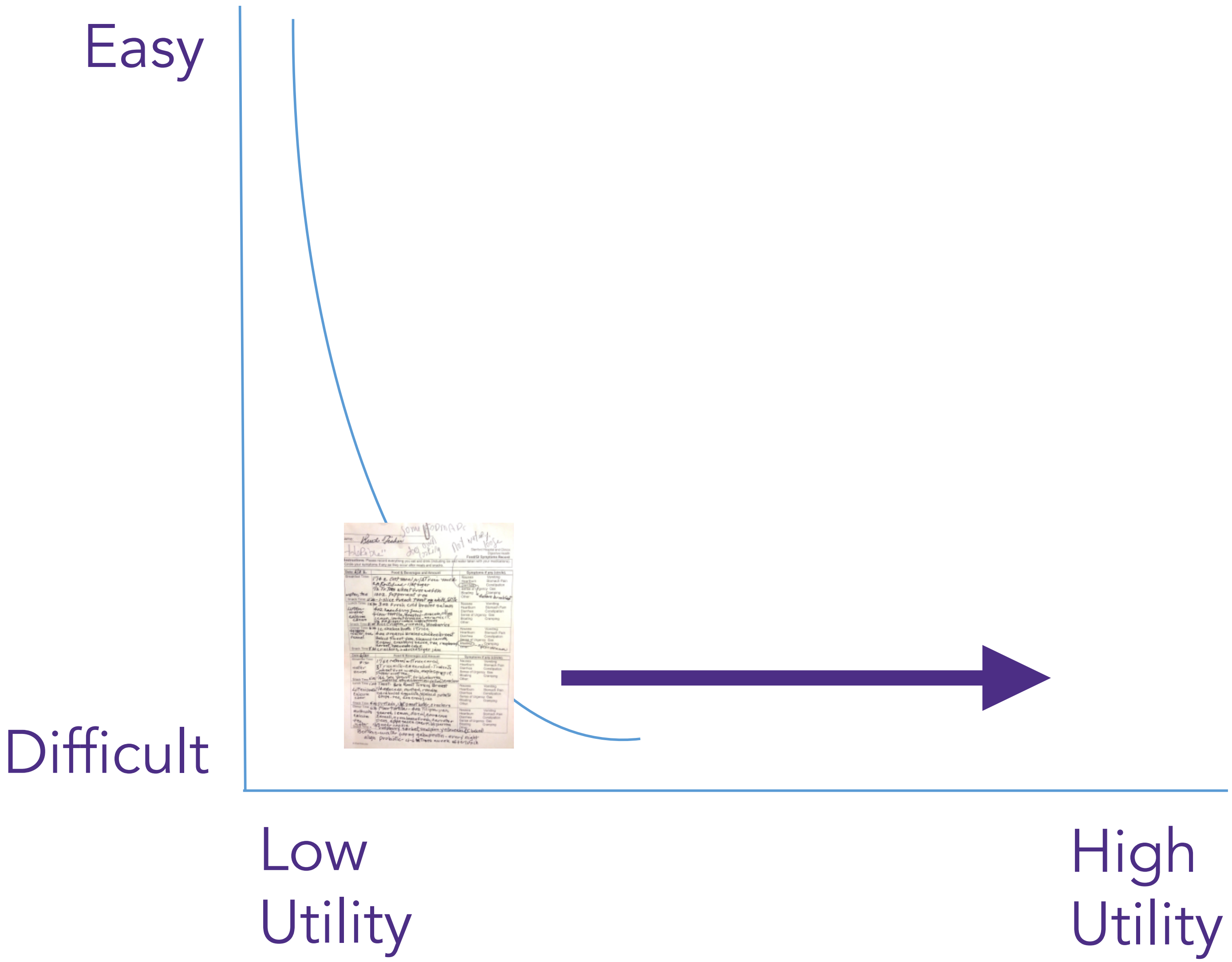
acknowledgement: Julie Kientz & James Fogarty

A More Realistic Notion of Where We Are



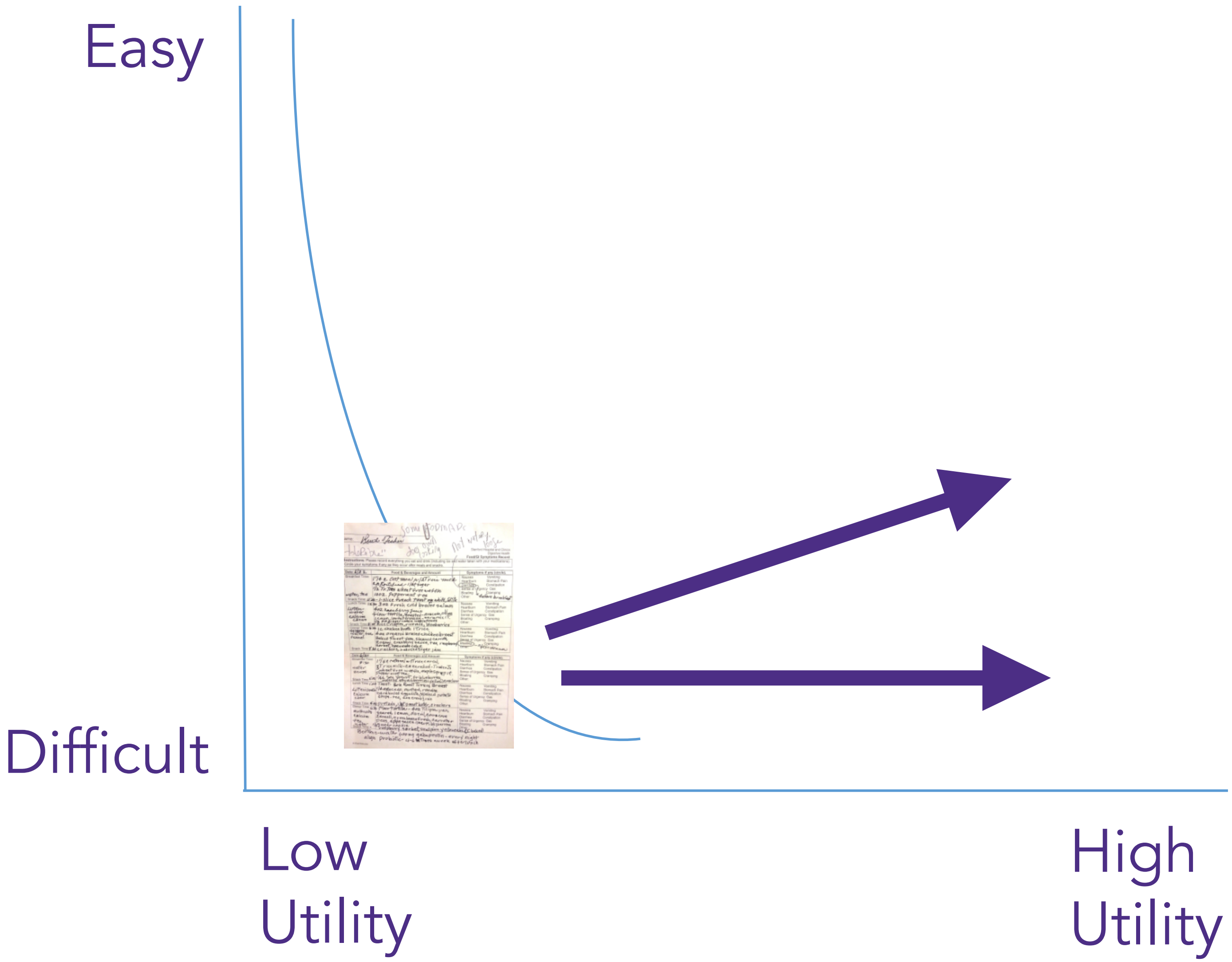
acknowledgement: Julie Kientz & James Fogarty

A More Realistic Notion of Where We Are


Easy
Difficult
Low Utility
High Utility

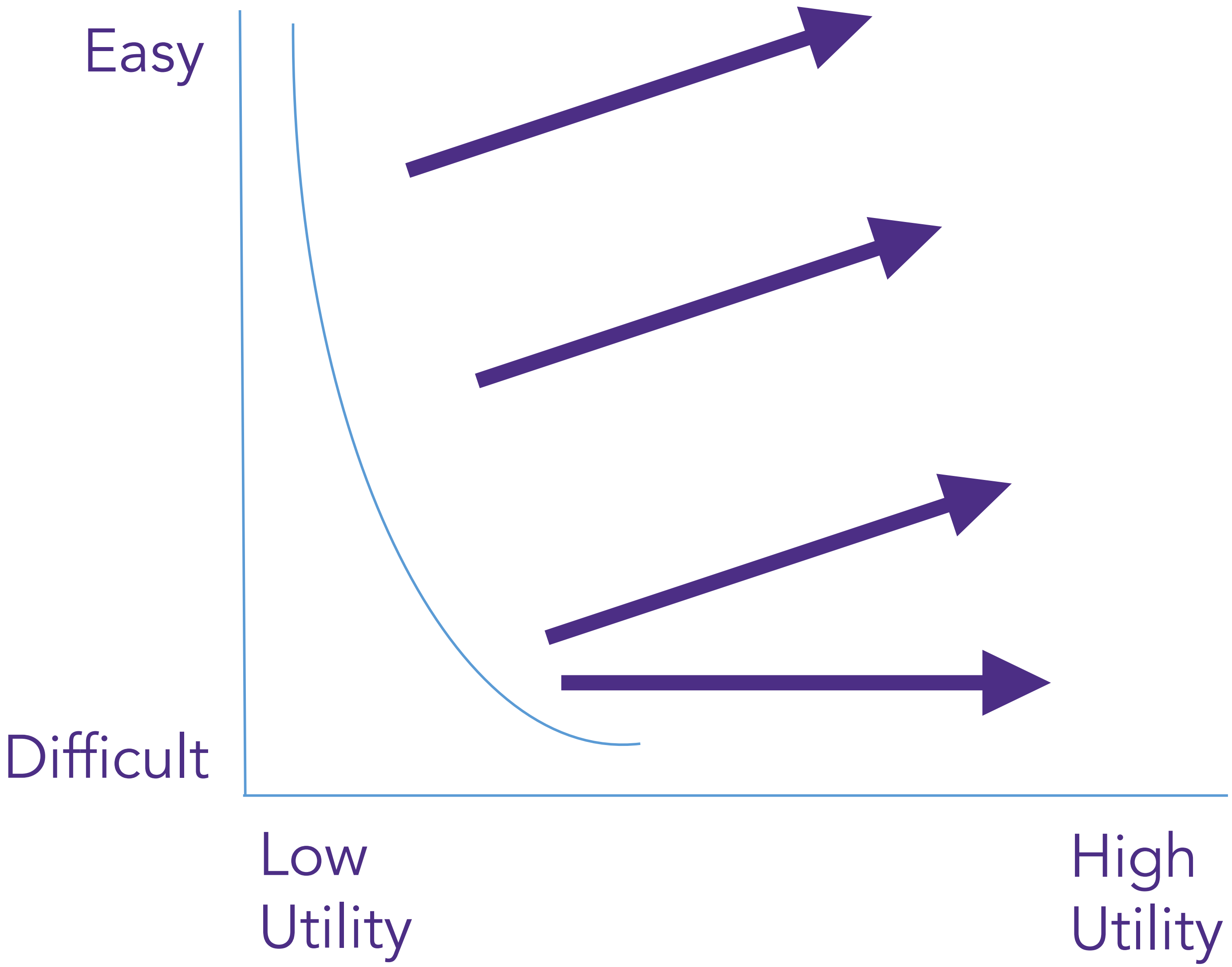
acknowledgement: Julie Kientz & James Fogarty

A More Realistic Notion of Where We Are


Easy
Difficult
Low Utility
High Utility

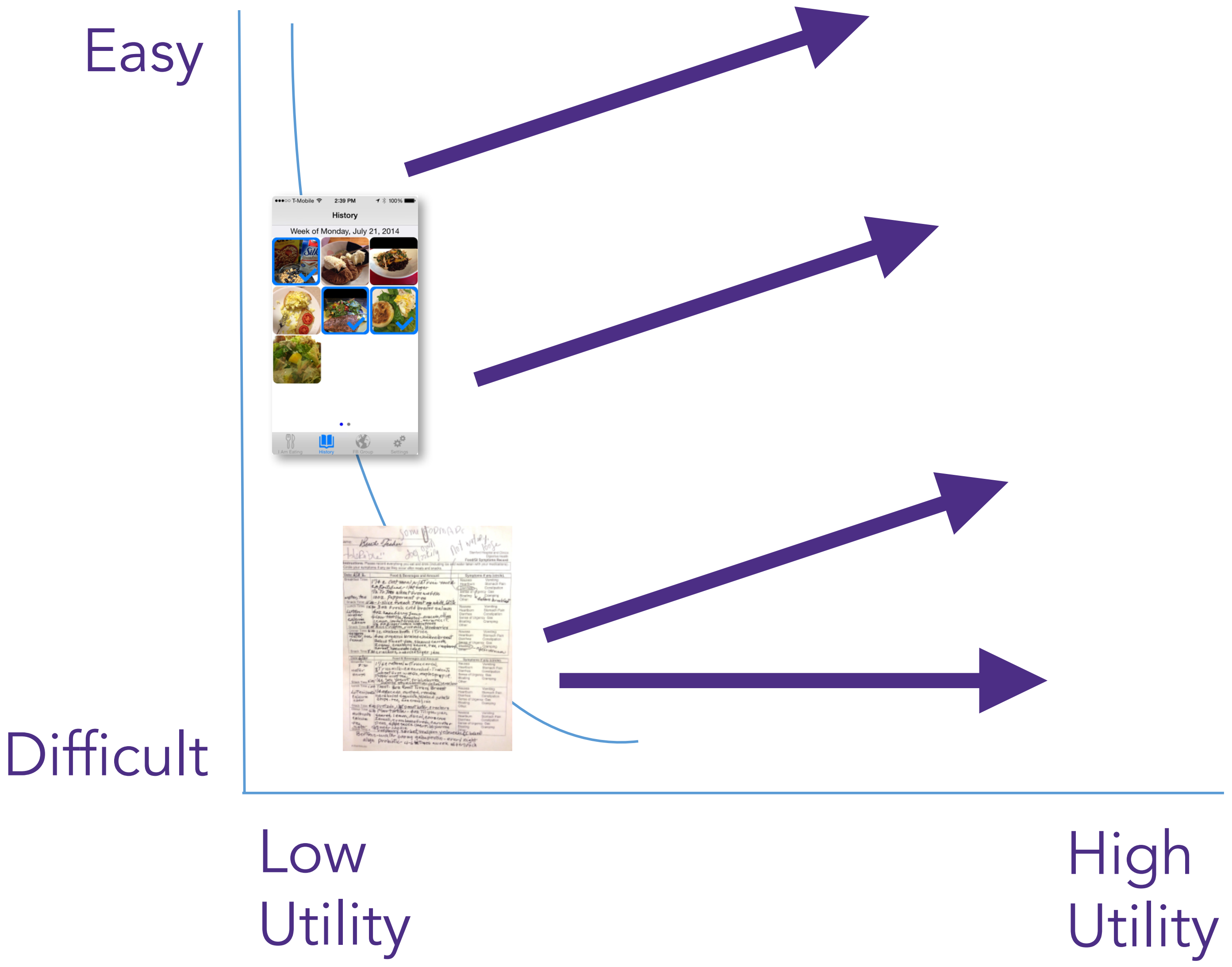
acknowledgement: Julie Kientz & James Fogarty

We should be pushing on the whole curve


Easy
Difficult
Low Utility
High Utility

acknowledgement: Julie Kientz & James Fogarty

We should be pushing on the whole curve


History
Week of Monday, July 21, 2014

Easy

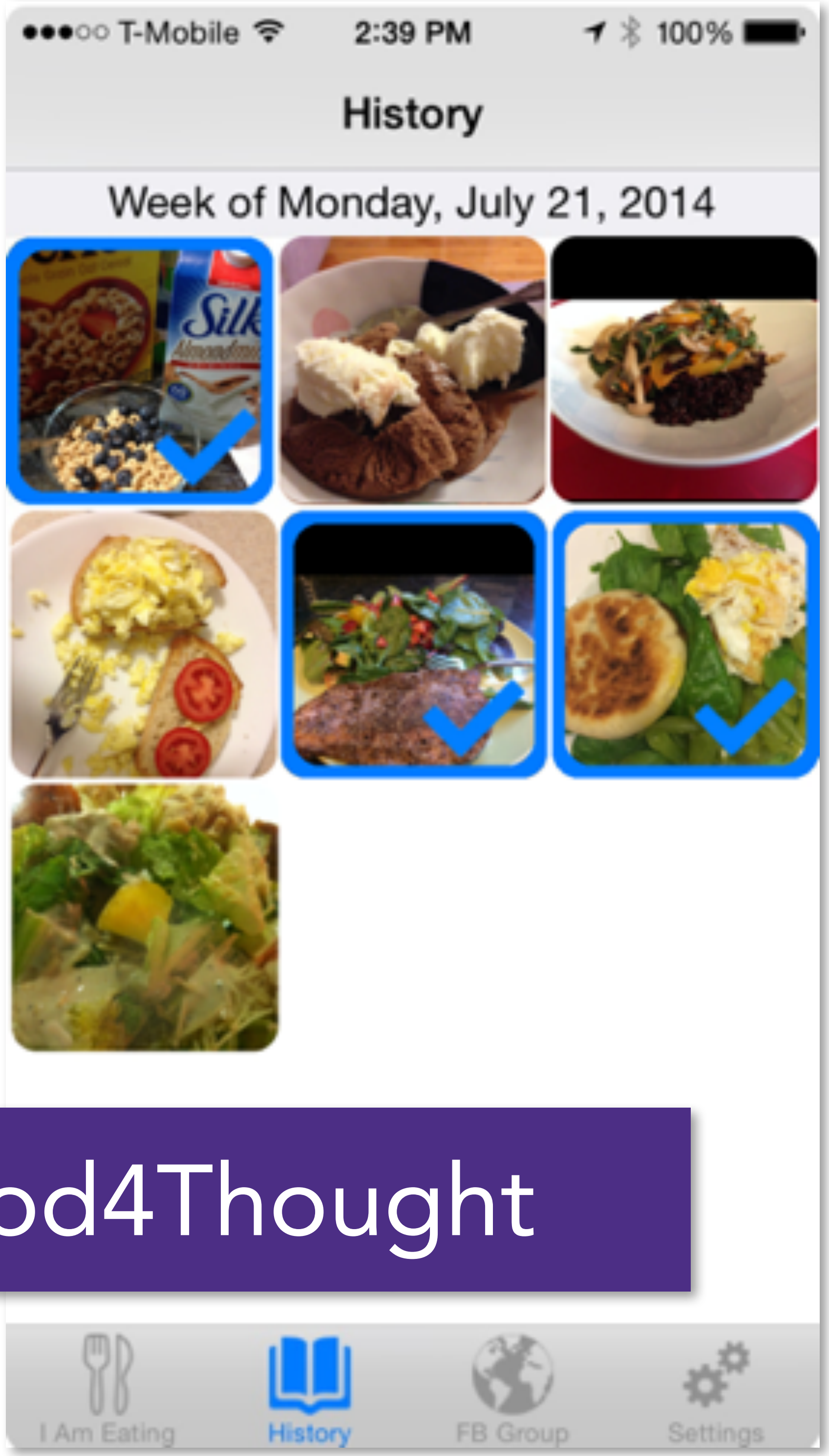
Difficult

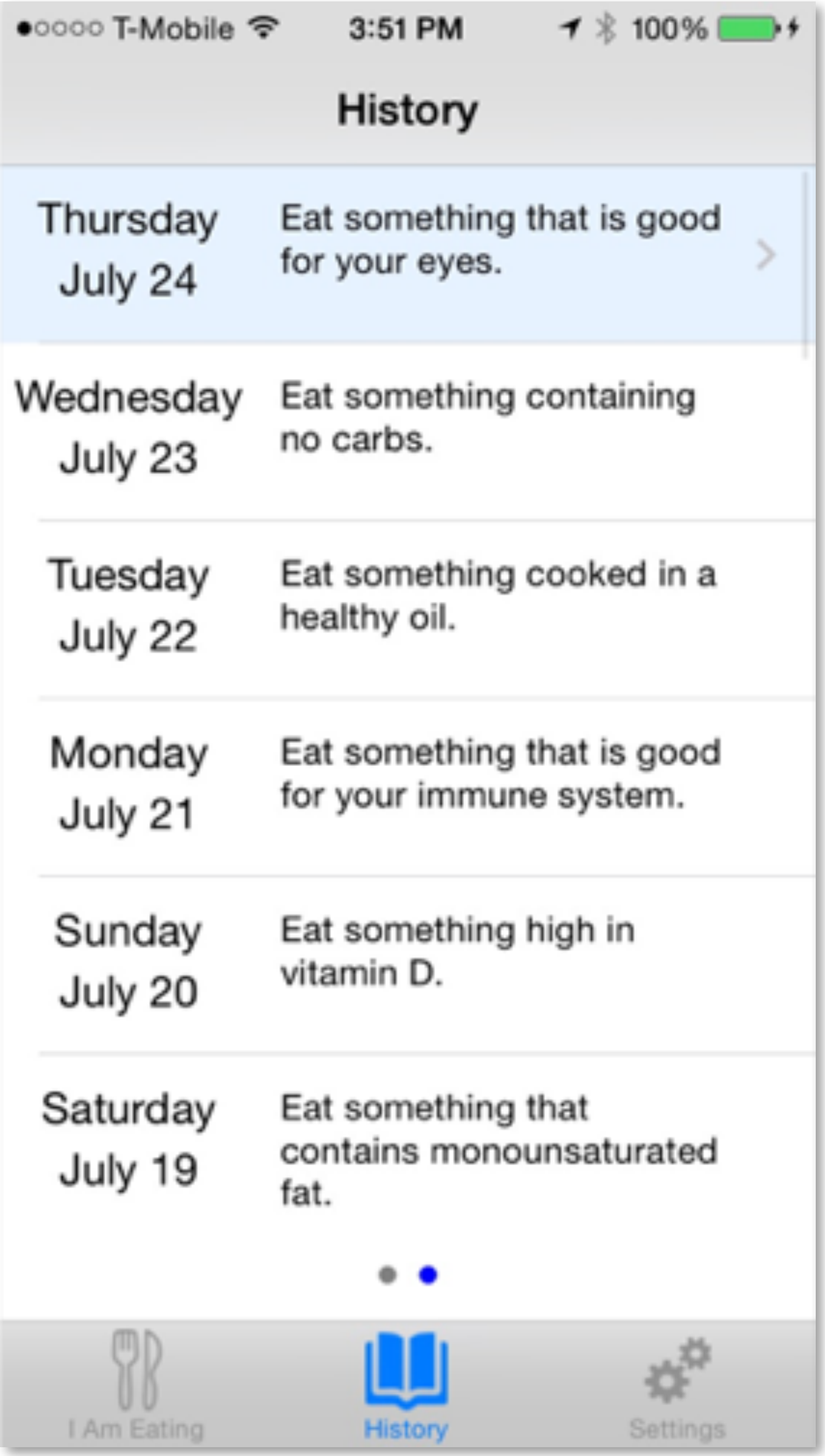
Low Utility

High Utility

acknowledgement: Julie Kientz & James Fogarty

Food4Thought


●●●○○ T-Mobile
2:39 PM
100%
History
Week of Monday, July 21, 2014
I Am Eating
History
FB Group
Settings


●○○○○ T-Mobile
3:51 PM
100%
History

Thursday July 24	Eat something that is good for your eyes.
Wednesday July 23	Eat something containing no carbs.
Tuesday July 22	Eat something cooked in a healthy oil.
Monday July 21	Eat something that is good for your immune system.
Sunday July 20	Eat something high in vitamin D.
Saturday July 19	Eat something that contains monounsaturated fat.

I Am Eating
History
Settings

Four Versions

	Social features	No social features
Nutrition challenges		
Non-nutrition challenges		

Nutrition challenges

Nutritionally prescriptive, serious, conventional

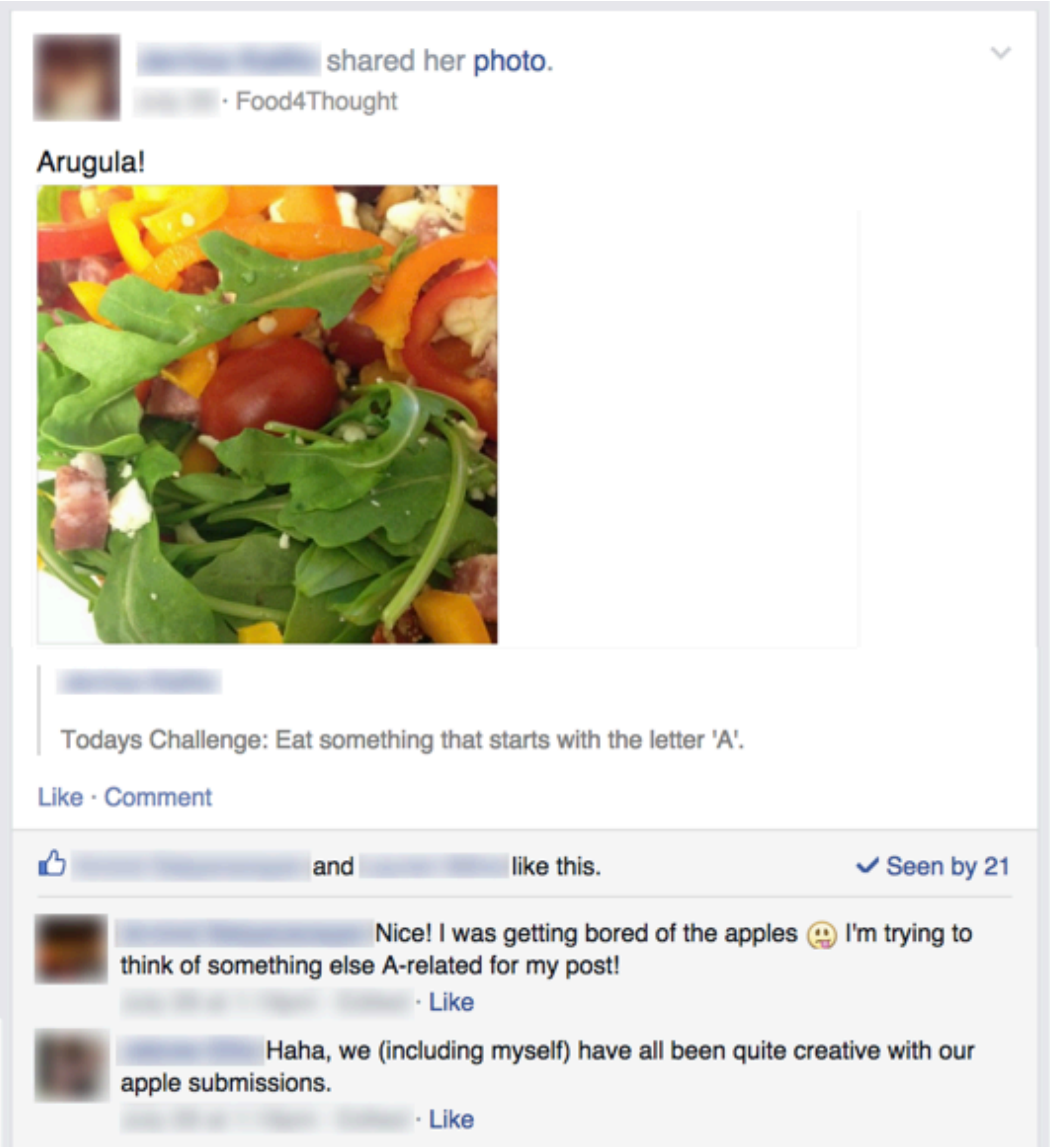
- Eat something high in fiber
- Eat something with at least 20 grams of protein
- Eat something that is good for your eyes

Non-nutrition challenges

fun, curiosity inspiring, random, varied

- Eat something that is yellow
- Eat something that an elephant would eat
- Eat something that reminds you of your high school years

Social features



[redacted] shared her photo.

[redacted] · Food4Thought

Arugula!

[redacted]

Todays Challenge: Eat something that starts with the letter 'A'.

Like · Comment

[redacted] and [redacted] like this. ✓ Seen by 21

[redacted] Nice! I was getting bored of the apples 😛 I'm trying to think of something else A-related for my post!

[redacted] · Like

[redacted] Haha, we (including myself) have all been quite creative with our apple submissions.

[redacted] · Like

Nutrition challenges

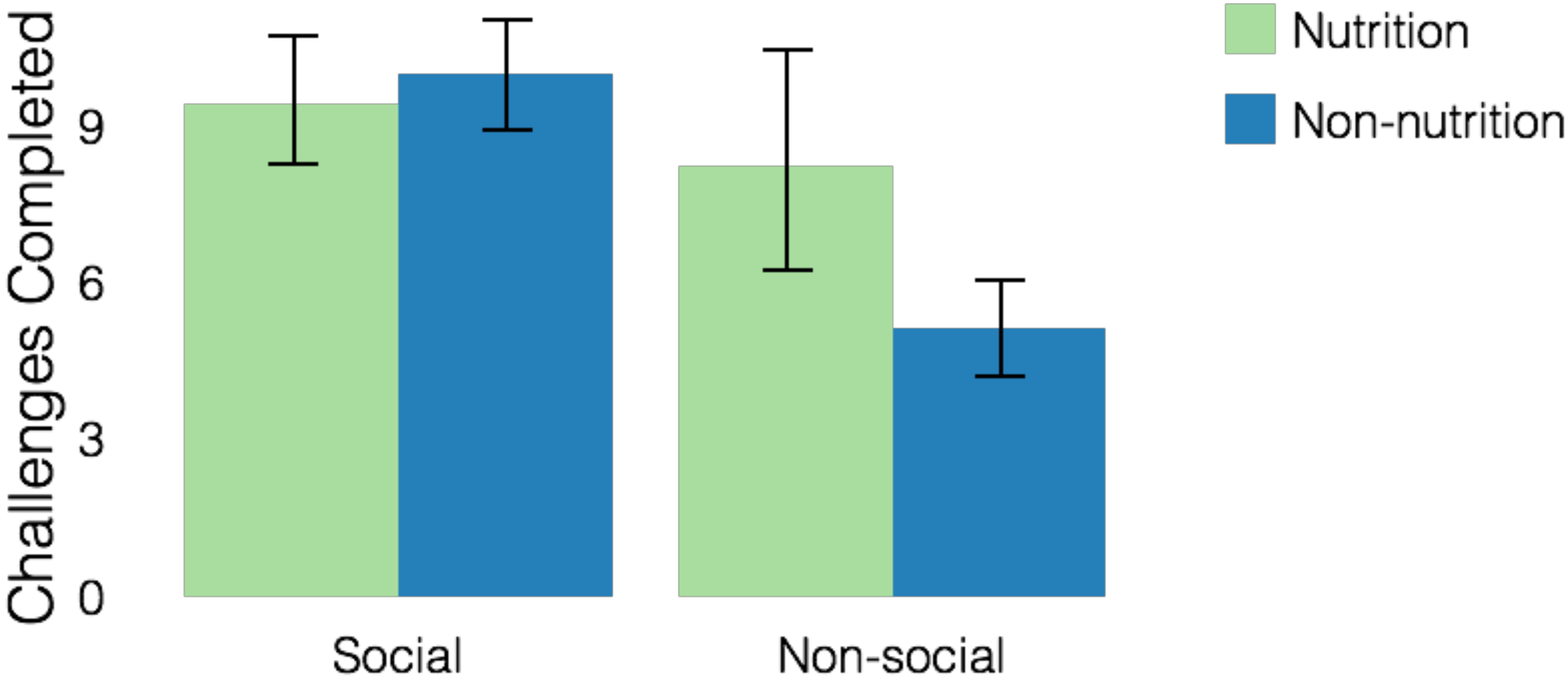
- Higher engagement
- More judgy

Non-nutrition challenges

- Greater gains in food mindfulness
- Challenges and activity felt more arbitrary

Social features

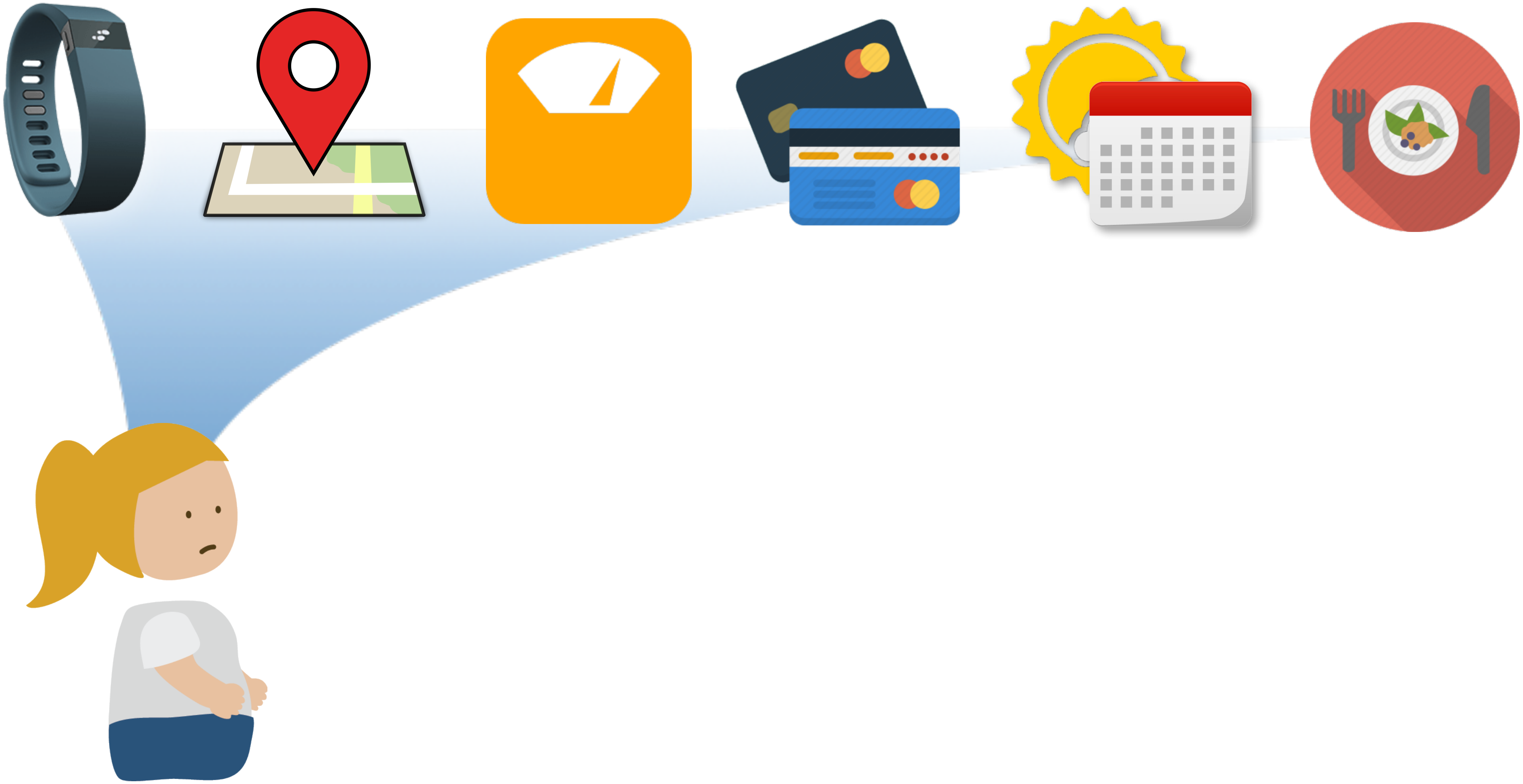
- Completed more challenges
- Less likely to use the app to record other foods


Challenges Completed
0
3
6
9
Social
Non-social
Nutrition
Non-nutrition

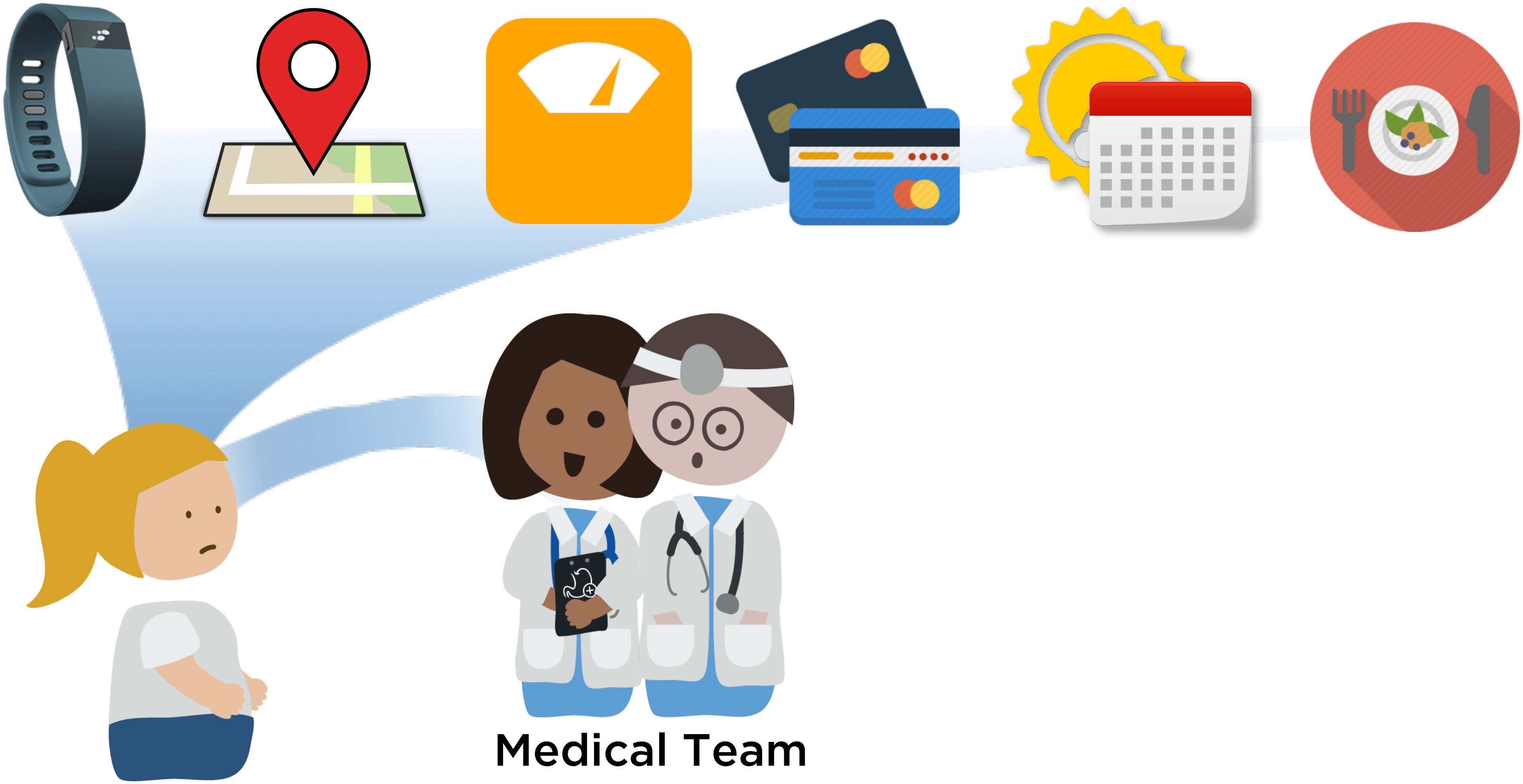
“Minimum viable data” and opportunity to design for experiences, not just data.

Assumption #5

Self-tracking.

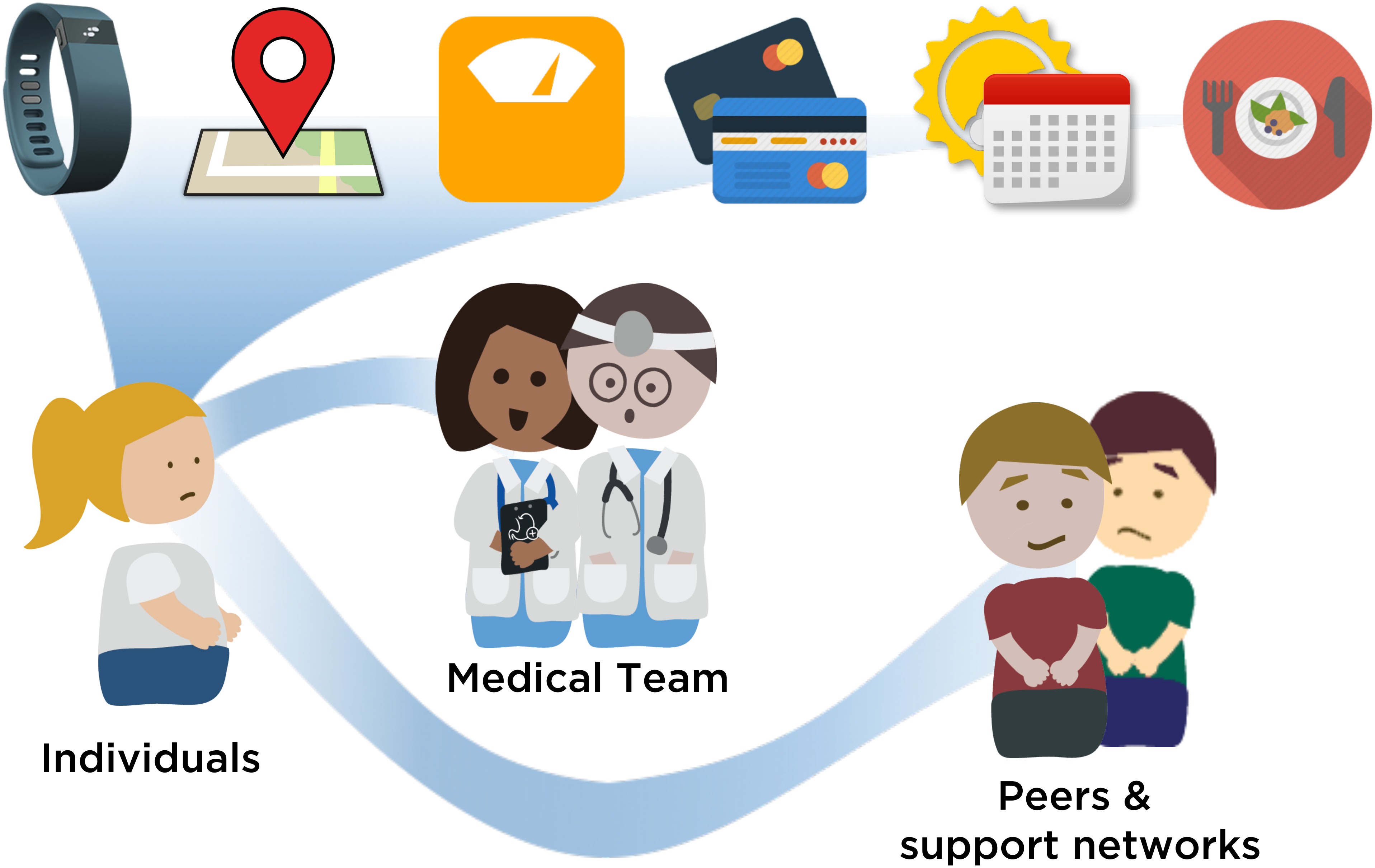


Individuals

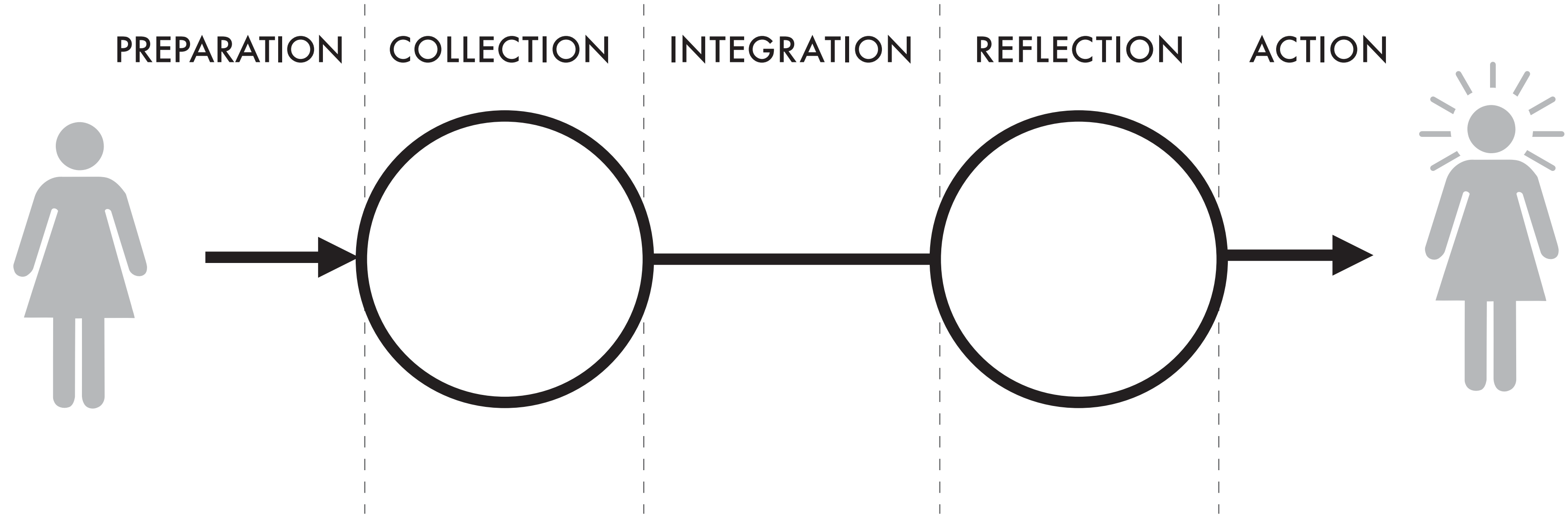


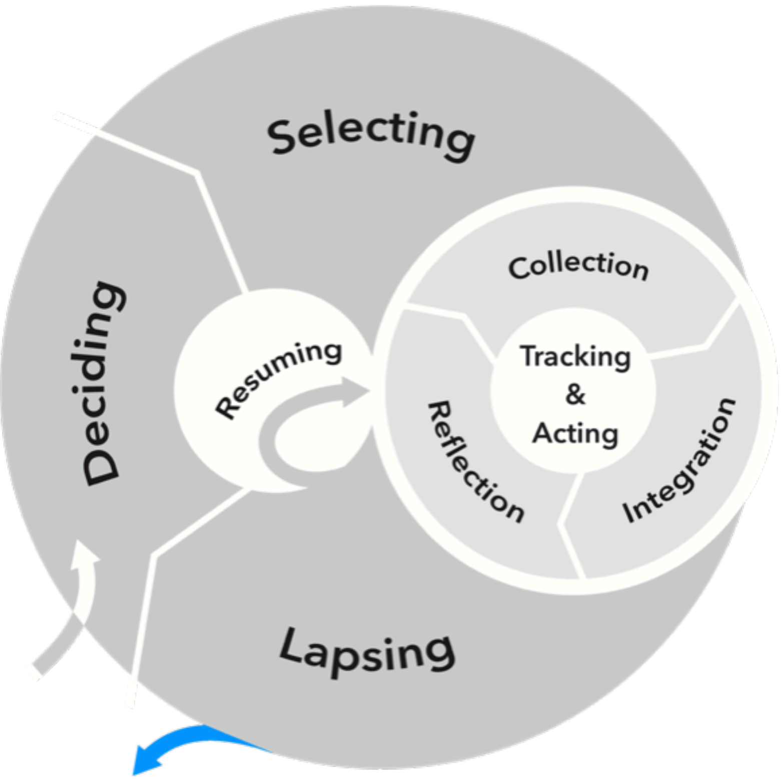
Medical Team

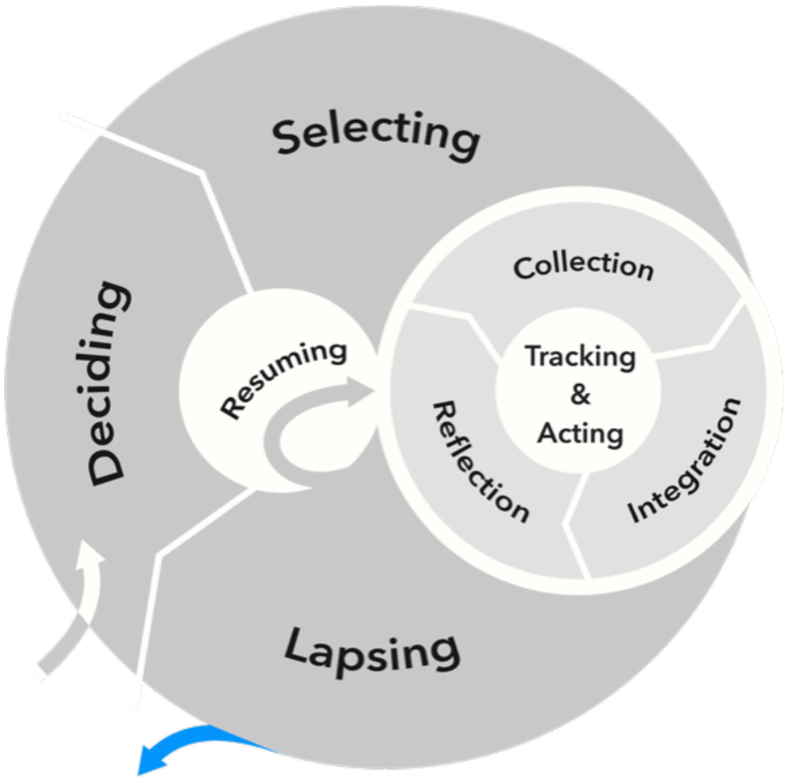
Individuals


Medical Team
Individuals
Peers &
support networks

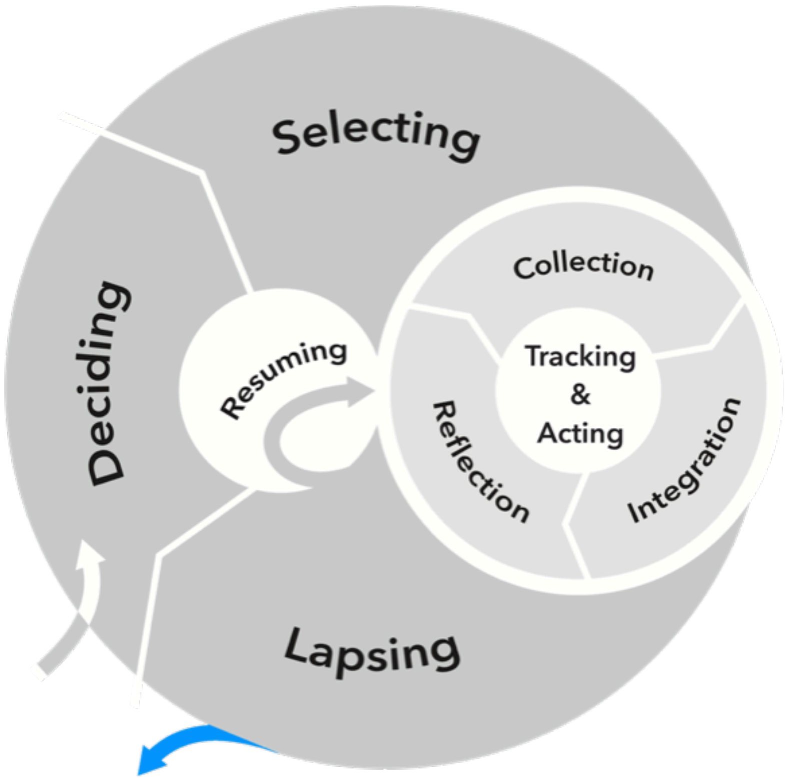
People (try to) enlist peers,
family, friends, & experts for help.
Families track together.


PREPARATION
COLLECTION
INTEGRATION
REFLECTION
ACTION

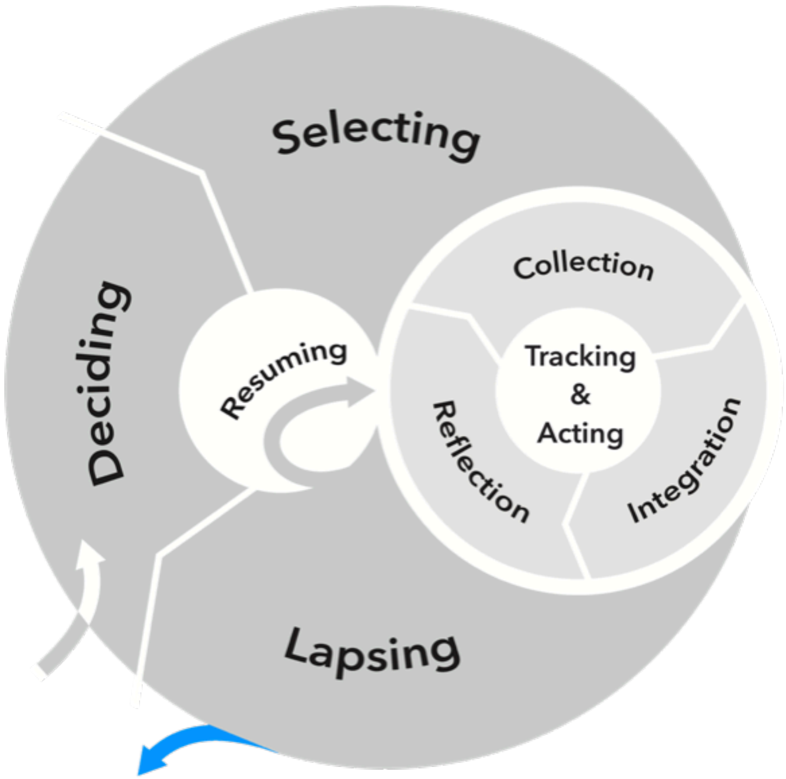

Selecting
Deciding
Lapsing
Resuming
Collection
Tracking
&
Acting
Reflection
Integration


Selecting
Deciding
Resuming
Collection
Tracking
&
Acting
Reflection
Integration
Lapsing

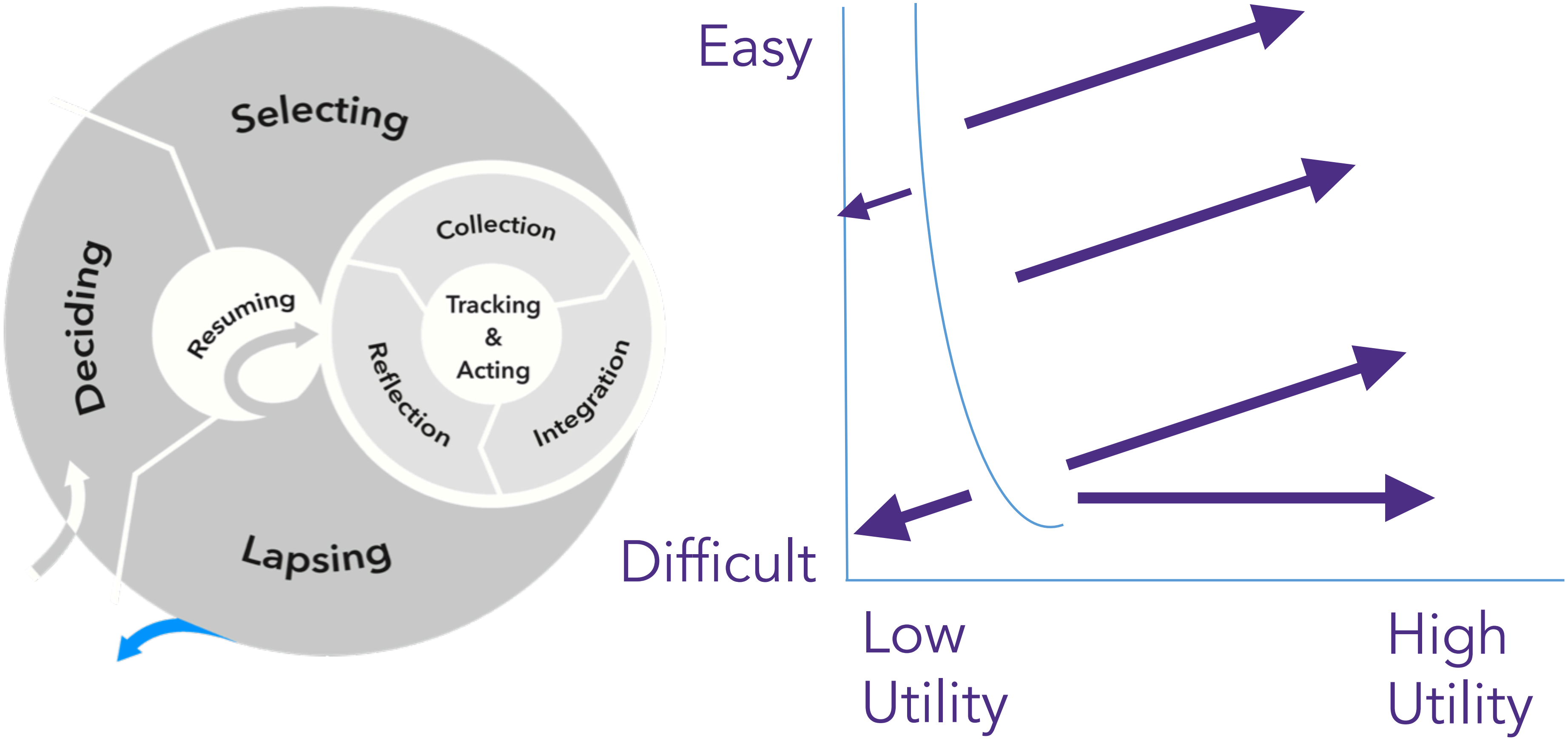
1. Need to better understand tool selection and how people set up their tracking.

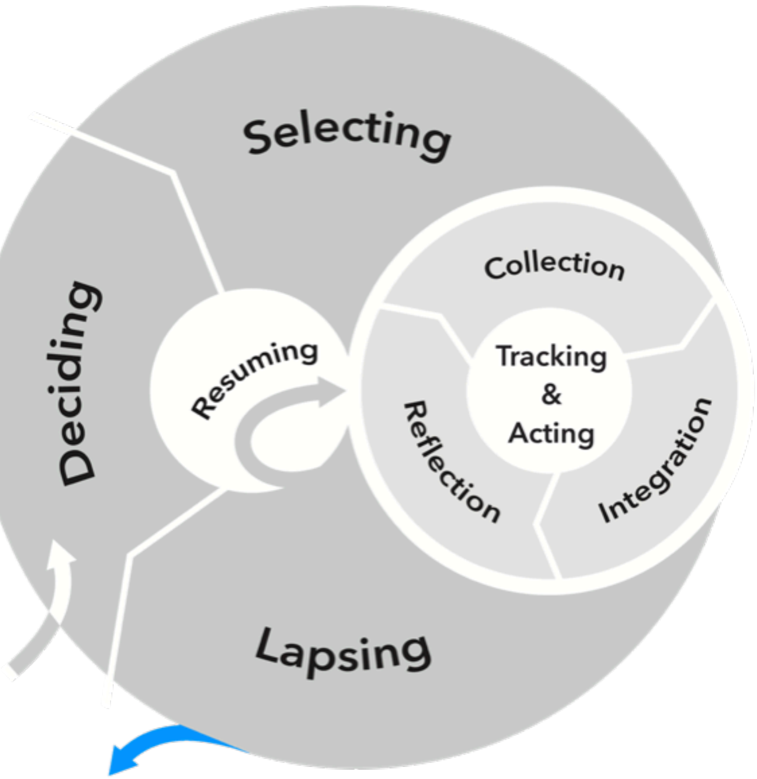

Selecting
Deciding
Resuming
Collection
Tracking
&
Acting
Reflection
Integration
Lapsing

1. Need to better understand tool selection and how people set up their tracking.
2. People have varied goals, with varied use patterns

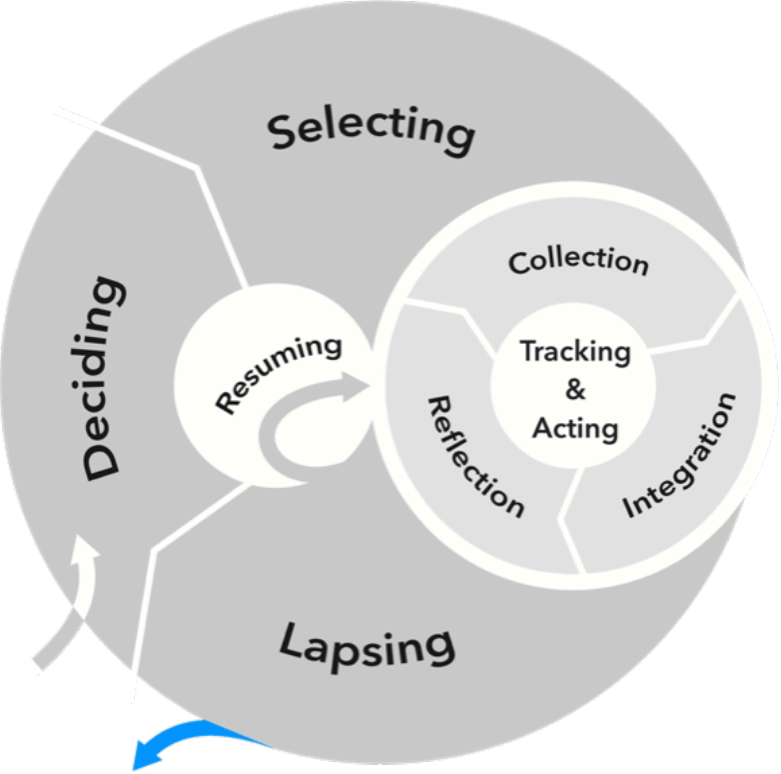

Selecting
Deciding
Resuming
Collection
Tracking & Acting
Reflection
Integration
Lapsing

1. Need to better understand tool selection and how people set up their tracking.
2. People have varied goals, with varied use patterns
3. Need to design for lapses and abandonment, not all of which are bad.

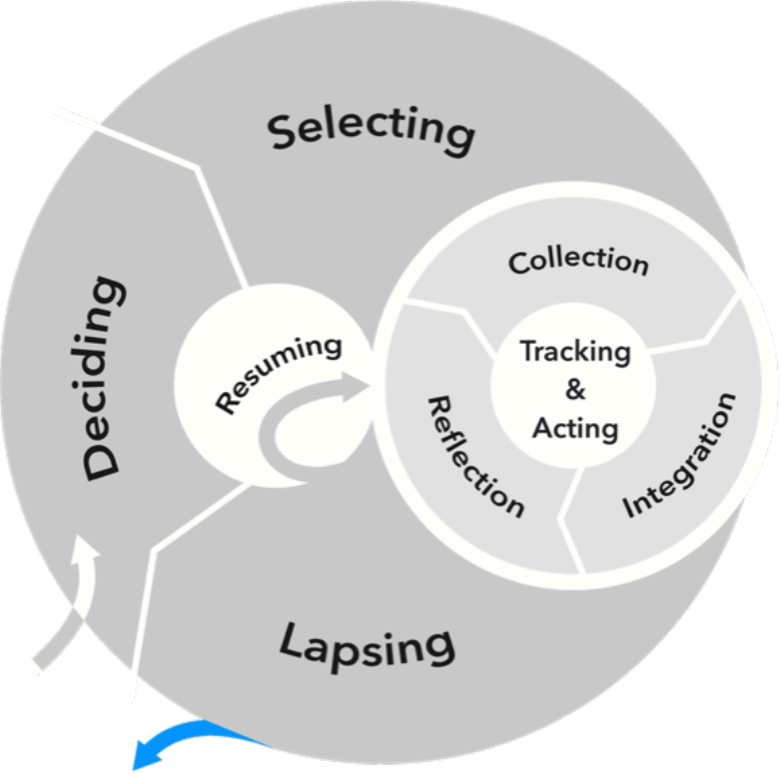

Selecting
Deciding
Resuming
Lapsing
Collection
Tracking
&
Acting
Reflection
Integration
Easy
Difficult
Low
Utility
High
Utility


Selecting
Deciding
Resuming
Collection
Tracking & Acting
Reflection
Integration
Lapsing

1. Need to better understand tool selection and how people set up their tracking.
2. People have varied goals, with varied use patterns
3. Need to design for lapses and abandonment, not all of which are bad.
4. Tracking can be high burden. Need to design for reduction and focus.


Selecting
Deciding
Resuming
Collection
Tracking & Acting
Reflection
Integration
Lapsing

1. Need to better understand tool selection and how people set up their tracking.
2. People have varied goals, with varied use patterns
3. Need to design for lapses and abandonment, not all of which are bad.
4. Tracking can be high burden. Need to design for reduction and focus.
5. It's about experiences, not just data.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Deciding
Resuming
Collection
Tracking
&
Acting
Reflection
Integration
Lapsing

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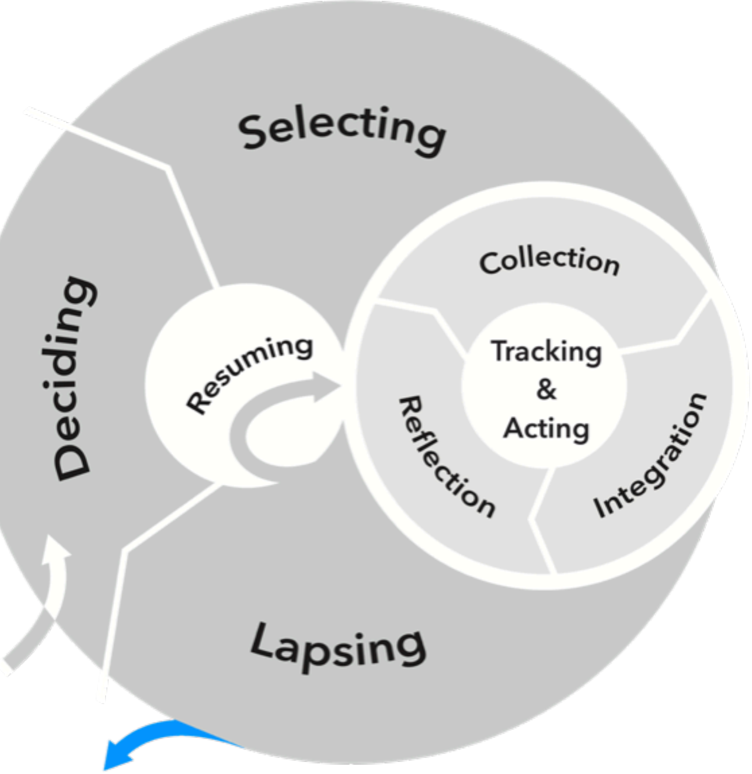
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University of Washington Innovation Award
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Jane
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Gouveia

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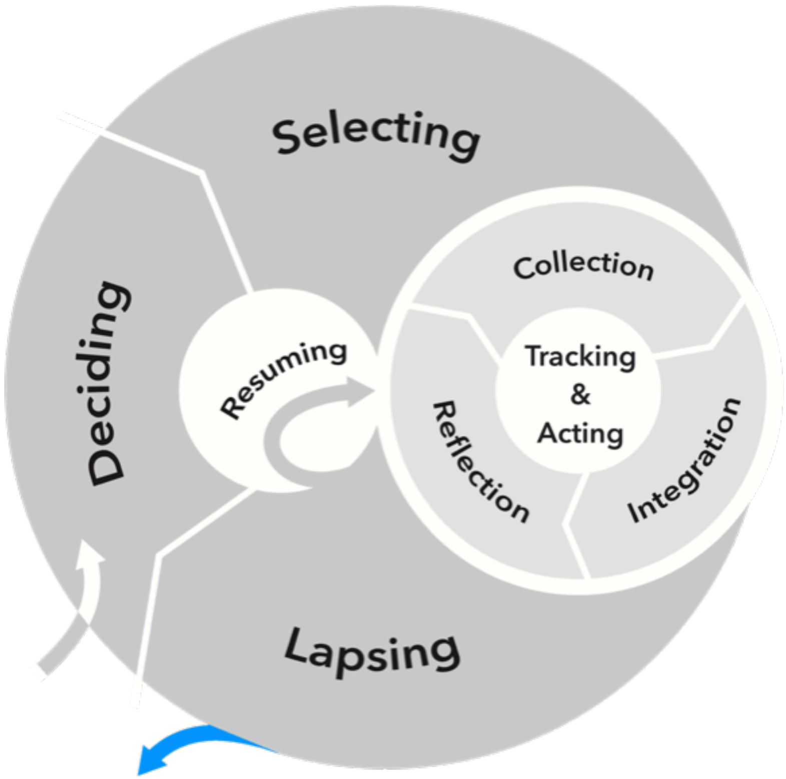
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