OneNote Meal: A Photo-Based Diary Study For Reflective Meal Tracking

eHealth --S19

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Disclosure

Yuhan, our co-authors, and I have no relevant relationships with commercial interests to disclose.
Learning Objectives

• Understanding “framing manipulation & valence” in the context of self-tracking.

• Learning how tracking meals by valence can affect people’s meal tracking experience.
Food Tracking

Challenge: Lack of Support for Reflection

[Cordeiro, 2015; Tomaz, 2013; Amft, 2005]
Reflection

Reflection On-Action:

- Reflecting *after* something happens
- Retroactively learning from past actions

Reflection In-Action:

- Reflecting *while* something happens
- Making responsive decisions

Reflection On-Action:

- Reflecting *after* something happens
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Reflection In-Action:

- Reflecting *while* something happens
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Framing Effect & Valence

Valence

A type of frame manipulation used to shape different perceptions of the same information

Highlights positive or negative aspects of the target behaviors


https://enlightenedleadershipnow.com/blog/2018/03/
Framing Effect & Valence

Achieved vs. Remaining Framing

Framing Effect & Valence

Productive vs. Distracted Framing

Valence of Meals

Healthy Meals

Unhealthy Meals

Research Question
Research Question

How does the **valence** of meals that people capture affect their food tracking experience, including:

- assessment of meal **healthiness**,  
- **self-reflection**,  
- and **food choice intention**?
Methods

Four-week diary study with 22 college students

Track only healthy meals
(HG, N= 13)

Track only unhealthy meals
(UG, N= 9)

icons are made by Freepik from Flaticon
Methods

Breakfast

Sunday, January 22, 2017  8:24 PM

Daily OneNote Meal Entry (HG-3)

HG: healthy meal tracking group.

Meal Entry:

<table>
<thead>
<tr>
<th>Meal Type</th>
<th>Meal Description/Preparation Method</th>
<th>Reasoning for “Healthy” or “Unhealthy”</th>
</tr>
</thead>
</table>
| Breakfast | Eaten on 1/20/17
Food: banana, dark chocolate peanut butter almond bar, dried mango | Bananas are a good source of potassium and other vitamins. Dried mangos are a healthier snack compared to other junk food. The bar is good for protein since it contains peanut butter and almonds |
Methods

- Receive weekly summary
  - USDA info input by researchers
- Follow-up interviews
- Pre/Post survey of dietary quality & attitudes on their eating habits

<table>
<thead>
<tr>
<th>Meal Item in Weekly Summary (UG-3)</th>
</tr>
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<tbody>
<tr>
<td><strong>1/23/2017 Lunch: ½ blueberry muffin</strong></td>
</tr>
<tr>
<td>Total Calorie</td>
</tr>
<tr>
<td>Protein</td>
</tr>
<tr>
<td>Total Carbohydrate</td>
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<tr>
<td>Total Fat</td>
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<tr>
<td>- Saturated</td>
</tr>
<tr>
<td>Sodium</td>
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</table>

<table>
<thead>
<tr>
<th><strong>1/23/2017 Lunch: Coffee (with sugar)</strong></th>
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<tbody>
<tr>
<td>Total Calorie</td>
</tr>
<tr>
<td>Protein</td>
</tr>
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UG: unhealthy meal tracking group.
Data Analysis

- Bottom-up thematic coding process
  - Written comments in OneNote
  - Interview transcripts
Results
General Usage

28 days, 642 meal entries in total

<table>
<thead>
<tr>
<th>Average Entries / Days Per Participant</th>
<th>HG (N = 13)</th>
<th>UG (N = 9)</th>
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<td>Total Entries</td>
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HG: healthy meal tracking group. UG: unhealthy meal tracking group.
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<td>4.23</td>
<td>6.11</td>
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<td>Missing Days</td>
<td>3.69</td>
<td>4</td>
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</table>

HG: healthy meal tracking group. UG: unhealthy meal tracking group.
Perceived Meal Healthiness

Valence shapes participants’ assessment on meal healthiness in opposite ways

Dinner, chicken quesadilla

For dinner I had a chicken quesadilla with cheese and rice from a dining hall on campus. This dinner was healthy because it included a variety of food groups

HG: healthy meal tracking group. UG: unhealthy meal tracking group.

Quesadilla

Homemade dinner: Quesadilla (flour tortilla) with chicken, sharp cheddar cheese and onions
Unhealthy but not terribly bad either
Many Cheese and not much veggies

HG-7

UG-8

Tuesday, January 17, 2017  11:41 PM

Wednesday, February 1, 2017  6:37 PM
Perceived Meal Healthiness

Valence shapes participants’ assessment on meal healthiness in opposite ways

**Omelette, banana, milk**
*Wednesday, January 25, 2017  09:25 AM*

This breakfast was home prepped and not shared. The omelette consisted of two eggs, diced ham, diced onions, and cheese. I think this meal is healthy because it provides a nice source of protein to start the day, along with some other vitamins like calcium, potassium, and fiber.

**HG-3**

**4/8/2017 Lunch**
*Friday, January 20, 2017  10:44AM*

1-19-17 This was my breakfast, a 2 egg omelet with cheese and green peppers. It was unhealthy since I cooked it in oil and I added extra cheese, so it had a lot of fat and saturated fat in it.

**UG-6**

**12/28 Pork Ramen with Egg**
*Thursday, December 29, 2016  2:16 AM*

Snack, using pack of ramen and hard boiled egg
This meal is unhealthy since there is artificial flavorings. Also this contains a lack of vegetables and meats.

**HG-13**

HG: healthy meal tracking group. UG: unhealthy meal tracking group.
The Effect of Valence on Self-Reflection

HG Participants: creating a positive picture of diet

“helpful to keep tracking and realize what I’m eating healthy” (HG-3)

“feel better than tracking everything” (HG-4)

“feel guilty when there’s nothing to capture” (HG-3, 5)
The Effect of Valence on Self-Reflection

UG Participants: going through a self-discovery journey

“(the foods) were a lot more unhealthy than I thought they were” (UG-7)

“judge my food more critically” (UG-6)

“feel good when there’s nothing to capture” (UG-3, 5, 7)
The Effect of Valence on Food Choice Intention

HG Participants: helping to maintain a healthy diet

“it helped me target for at least one (healthy) meal a day” (HG-4)

“a good opportunity to keep up with healthy foods” (HG-12)

“to avoid the days when there’s nothing to upload” (HG-1, HG-13)
UG Participants: enabling conscious eating

“more cautionary before eating” (UG-1, 4, 5, 6, 7)

“try to balance out the unhealthy food I log” (UG-4)

“to avoid eating the food that is recognized unhealthy” (UG-5)
Discussion
Valence: A Filter for Reflection

Selectively Tracking

Reduce tracking burden

icons are made by Freepik from Flaticon
Incorporating valence into food tracking practice.

Healthy or unhealthy?

http://www.oprah.com/spirit/understanding-the-food-guidelines-ask-geneen-roth

Valence: A Filter for Reflection
Taking alternative sessions to track meals by valence.
Supporting Reflection Throughout Self-Tracking

before eating

while eating

after eating / logging food data

revisit food data

icons are made by Freepik from Flaticon
Supporting Reflection Throughout Self-Tracking

before eating

while eating

after eating / logging food data

revisit food data

How was the food?

icons are made by Freepik from Flaticon
Thank you!
jlb883@ist.psu.edu
yuhanluo@umd.edu
Questions

As a type of frame manipulation, valence shapes people’s perception of the same information differently, thereby affecting their attitudes and behaviors in different ways. In the context of self-tracking, which of the following most appropriately applies “valence manipulation”?

A. Sleep tracking: one condition focusing on tracking bedtime and the other condition focusing on tracking wake-up time.
B. Food tracking: one condition focusing on tracking protein intake and the other condition focusing on calorie intake.
C. Time spent tracking: one condition focusing on assessing the level of productivity and the other condition focusing on assessing the level of distraction.
D. Exercising tracking: one condition focusing on tracking step counts and the other condition focusing on tracking sedentary time.
A. Sleep tracking: one condition focusing on tracking bedtime and the other condition focusing on tracking wake-up time.

B. Food tracking: one condition focusing on tracking protein intake and the other condition focusing on calorie intake.

C. **Time spent tracking: one condition focusing on assessing the level of productivity and the other condition focusing on assessing the level of distraction.**

D. Exercising tracking: one condition focusing on tracking step counts and the other condition focusing on tracking sedentary time.

Explanation: Based on prior research, “valence manipulation” usually casts the same information either in a positive or a negative light. Therefore, tracking the same information (time spent) using opposite scales (productivity versus distraction) is most appropriate. Among the incorrect answers, bedtime and wake-up time frame different information. Protein intake and calorie intake are parts of the food intake, but they do not frame the food intake oppositely. Step counts and sedentary time seem to frame the same information oppositely, whereas they do not examine the information from the same dimension.
Self-reflection is essential for gaining insights from self-tracking data. Opportunities for reflection occur at various points throughout the self-tracking process, in the form of reflection-on-action and reflection-in-action. Which of the following tracking activities helps support reflection-in-action?

A. Providing the user with information once a week showing that they most frequently engage in binge eating behaviors on weekends.
B. Prompting the user to answer nutrition-related questions at their usual lunchtime.
C. Inquiring at the end of the day whether the user feels that their meals of the day are on track with their weekly goals.
D. Asking how the user rationalized their meal choices once they have entered their food diary with their breakfast foods.
Answer

A. Providing the user with information once a week showing that they most frequently engage in binge eating behaviors on weekends.

B. **Prompting the user to answer nutrition-related questions at their usual lunchtime.**

C. Inquiring at the end of the day whether the user feels that their meals of the day are on track with their weekly goals.

D. Asking how the user rationalized their meal choices once they have entered their food diary with their breakfast foods.

Explanation: Based on previous work, reflection-in-action is prompted in-situ, or when the behavior takes place. However, reflection-on-action occurs when considering one’s habits over time, often through the use of aggregated feedback data. In the correct answer, B, this feedback is set to coincide with the time leading up to or during the meal choice, prompting the user to think through their behavior and potentially make a more informed decision. The other answers promote reflection-on-action, providing them with past information which can help them be aware of their overall eating habits and set goals for future food decisions.
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<th>Age</th>
<th>Major</th>
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## General Usage

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