DISCOURSE ANALYSIS OF USER FORUMS IN AN ONLINE WEIGHT LOSS APPLICATION

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Weight Loss

“Okay, but each pound counts as a separate wish!”

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Online Weight-loss Communities

- Online communities increasingly popular for supporting weight loss.
- Connect, Share, Get Support.
Main Goal

Study user’s language in correlation with their weight loss dynamics.
Issues Studied

- Questions
- Seek Information
- Sentiment
- Emotions in posts
- Cohesion
- Focus on the goal

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Lose It!

- Weight-loss application

- Set a daily calorie budget
- Track your food & exercise
- Stay motivated!
- Achieve the goal
Why is this work interesting?

- Automating the process of language analysis
- NLP aspects
- Weekly check-in weights
Thread Topic – “Someday I will…”

Do a pull-up 😊

..actually enjoy exercising.

Stop participating in the lose it forums, but obviously not today.

I hope you fail 😊

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Thread Topic: “Can’t lose weight”

I gained over 30 lbs in the last year and am stressed about losing it. I eat 1600 calories a day and burn more than that in exercise, but I haven’t lost any weight. I am so confused.

You’ve only been a member for less than 2 months. I suggest you relax. Adjust your habits to something you can live with.

You sound just like me. Try diligently logging everything you consume.
Types of Users based on Weekly Weight Check-in

**Category-A : Non-increasing**

**Category-B : Fluctuating**

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Weekly Weight Check-ins of two individual Users

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## Statistics of Users and Forum Posts

<table>
<thead>
<tr>
<th>Category</th>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>#Total Users</td>
<td>1127</td>
<td>1143</td>
</tr>
<tr>
<td>#Forum Users</td>
<td>29</td>
<td>68</td>
</tr>
<tr>
<td>#Forum Posts</td>
<td>99</td>
<td>1279</td>
</tr>
<tr>
<td>Posts per user</td>
<td>3.5</td>
<td>18.2</td>
</tr>
<tr>
<td>Words per post</td>
<td>49.1</td>
<td>77.3</td>
</tr>
</tbody>
</table>

Weight Pattern

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Issues Studied

- Seek Information
- Emotions in posts
- Focus on the goal

Questions
Sentiment
Cohesion

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1st Issue

Questions
Seek Information

Sentiment
Emotions in posts

Cohesion
Focus on the goal

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Asking Questions

People on online health communities mainly engage in two activities:

- Seeking information.
- Getting emotional support.

I would appreciate any advice on how to fight the cravings and reduce my sugar intake. Any suggestions for dealing with a sweet tooth?

- Part-of-Speech tagging
- ‘?’ symbol

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## Question Posts vs User Types

<table>
<thead>
<tr>
<th></th>
<th>Category-A (Non-increasing)</th>
<th>Category-B (Fluctuating)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Questions per User</td>
<td>32.6%</td>
<td>37.7%</td>
</tr>
<tr>
<td>Standard Error</td>
<td>0.061</td>
<td>0.042</td>
</tr>
</tbody>
</table>

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2nd Issue

Questions
Seek Information

Sentiment
Emotions in posts

Cohesion
Focus on the goal

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Sentiment of Posts

- To understand if loss of weight impacts the sentiment of user’s posts
- Stanford sentiment analyzer
- Three types of sentiment are extracted
  - Positive; Neutral; Negative
Sentiment of Users’ Posts

Weight-Loss Pattern

Category-A

Category-B

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Sentiment Extracted from User’s Posts on Lose It! Forums

- Posts of users belonging to category-A are more neutral
- Posts made by users from category-B are of negative sentiment

Category-B (fluctuating) users *might* require more emotional support.
3rd Issue

Questions
Seek Information

Sentiment
Emotions in posts

Cohesion
Focus on the goal

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Cohesion with Previous Posts

- Cohesion – Property of well-written document that links sentences to be in the same context.

- Mainly interested in finding if a user’s post is similar w.r.t previous posts in a thread.
Measuring Cohesion Score

\[ \text{Cohesion Score} = \frac{|A \cap B|}{|B|} \]

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## Cohesion Score vs User Types

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<th>Category-B (Fluctuating)</th>
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<tbody>
<tr>
<td>Average Cohesion Score</td>
<td>0.51</td>
<td>0.42</td>
</tr>
<tr>
<td>Standard Error</td>
<td>0.027</td>
<td>0.008</td>
</tr>
</tbody>
</table>

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## Overall Results

- **Question Posts vs User Types**

<table>
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- **Sentiment vs User Types**

<table>
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<th>Category</th>
<th>Sentiment</th>
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</thead>
<tbody>
<tr>
<td>Category-A (Non-Increasing)</td>
<td>21% (+ve); 48%; 31% (-ve)</td>
</tr>
<tr>
<td>Category-B (Fluctuating)</td>
<td>19% (+ve); 36%; 45% (-ve)</td>
</tr>
</tbody>
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- **Cohesion Score vs User Types**

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Summary

- Analysis of language vs weight loss dynamics

- Four main inferences:
  - Category-B actively participate on online discussion forums
  - Category-B users post more questions
  - Category-A contribute to more cohesive posts
  - Category-B users post more number of negative sentiment posts

- Early “Proof of Concept” for providing insights on user behavior in weight loss communities

Thank you!

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