

# Losing It Online: Characterizing Participation in an Online Weight Loss Community

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## ABSTRACT

Many people struggle with their weight and are turning to online communities for social and informational support. The aim of this study is to understand the issues commonly discussed in online weight loss communities. Through observation and content analysis of threads in one specific weight loss community, we identified 17 distinct categories discussed by the participants. We detail four categories specifically: Personal Experience, Consumption Choices, Dieting Strategy, and Exercise. Our analysis describes some key user roles and states that often relate to different phases of a person's weight loss journey. We identify a set of transient states, which are not proper roles but are significant in an online community where individuals are attempting to change their own behaviors. We close with design suggestions for encouraging and maintaining participant engagement in an online health community.

## Categories and Subject Descriptors

H.5.3. Group and Organization Interfaces

## General Terms

Design, Human Factors

## Keywords

Weight loss, online community, content analysis

## 1. INTRODUCTION

Kevin has struggled with his weight for years. When visiting his family physician, he was diagnosed with early stage heart disease and pre-diabetes, two conditions he had long suspected. The treatment was "simple." Kevin should eat better and lose his extra weight. His doctor recommended that he consider one of the many online weight loss communities but did not recommend one specifically. Kevin wondered, "what are these communities like? What kind of help do they really provide?"

Many people face Kevin's situation each year. They need to lose weight but wonder how to get the proper support to make the lifestyle changes necessary to achieve long-term weight loss and maintenance. Commercial programs tout success, but not

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*GROUP'14*, November 9–12, 2014, Sanibel Island, Florida, USA.

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<http://dx.doi.org/10.1145/2660398.2660416>

everyone has the financial means to afford them. Thus free or low-cost online weight loss communities may be attractive ways help them meet their goals.

Current research regarding the success of online weight loss communities tells a mixed story. Studies within medical and public health literature demonstrate success for some communities and disappointment for others, where success is measured in terms of weight loss outcomes [1, 2, 10]. What these studies cannot answer is *why* some communities succeeded whereas others failed. Given the uncertainty surrounding these mixed results, a better understanding of participation in online weight loss communities is necessary.

In this study, we characterize participation in a successful online weight loss community. We aim to distinguish which design and participation features like forums and activity tracking are likely to lead to successful weight loss outcomes. To accomplish this aim, we conducted an inductive analysis of discussion threads in one popular online weight loss community. Based on this work, we can speak to the nature of participation and describe what happens in these threads. Further, given our grounded view of the community, we can speak to possible design features that could improve interaction and retention in online weight loss communities.

In the following sections, we review the relevant literature from the medical, public health, and human-computer interaction (HCI) tradition that specifically considers the experiential aspects and efficacy of online health communities. We briefly describe the weight loss community in our study and the methods that we used. The bulk of the paper focuses on the category scheme and the type of participation we saw across those categories. We follow up by considering some of the different roles that we have identified in the community, a little about how individuals appear to be integrated into the community, and a number of design directions that this specific community might take to help keep people involved.

## 2. RELATED WORK

The treatment of information technologies for weight loss in healthcare and HCI research literatures differ in focus. Medical and public health research primarily focus on weight loss as an end result, with a secondary interest in behavioral constructs that might drive the weight loss or usage (e.g., social support). In these studies, a technology's success is determined by the number of pounds lost. Alternatively, the HCI perspective focuses more on technology design processes and user experience, as opposed to health outcomes [9].

Medical research about weight loss has been geared toward participant outcomes. However the methods for successful weight loss remain unclear. Two comprehensive meta-reviews [12, 18] reported that online weight loss programs can result in weight loss comparable to face-to-face programs, though with some caveats. These limitations included the use of heterogeneous samples limiting interpretability of the results. Another study [8] looked at randomized controlled trials, focusing on an informational approach to weight loss that disseminates information similar to that generated in an online community. Individuals in the intervention condition lost weight, but like other approaches, the intervention group was required to login and visit a particular website, where the control group was not required to participate in any online activities. A study by Hwang et al. [7] of SparkPeople.com, a weight loss online community, found a positive correlation between weight loss and participants who logged their weight at least four times. As well, some usage variables, such as posting at least once to the online forum, were also associated with weight loss. Finally, Tsai and Wadden [17] considered nine commercial weight loss programs, consisting of a mixture of face-to-face and online programs. They found that the success of programs varied depending on the types of services offered by the program and used by the participants. For example, by comparing WeightWatchers (known for face-to-face meetings) to other programs, they found those in WeightWatchers who did not participate in any services gained weight. Those in other programs who participated in face-to-face services, such as peer consulting, lost weight. Tsai and Wadden noted wide varying attrition rates across the programs that they studied, ranging from 2.5% to 67%.

This problem of attrition in online weight loss communities reflects the importance of user experience; people who have a positive experience as opposed to those who have a negative experience are more likely to return to a given site, and repeated use can impact weight loss outcomes. Studies from the HCI tradition largely focus on changing user attitudes and the impact of specific features on target populations but not always about the relationship between online communities and successful weight loss. Improving physical activity and healthy food choices can enhance social and cultural communities. The Eatwell and CommunityMosaic systems [3, 4, 14] provided social support networks for low income community members to characterize their healthy choices and activities. Eatwell relied on a phone based journal that let users call and share stories about their own experiences with food and consumption choices. CommunityMosaic allowed community members to share photos and text messages. Both systems were able to influence individuals to participate in the systems. The qualitative analysis characterizes how individuals see their participation in these communities through interviews. Purpura et al. [15] proposed a “critical design” of a system called Fit4Life. The system surfaced consequences and rewards through sensors and a phone application tracking food consumption, heart rate, and metabolic rate. Through the proposed design of Fit4Life, the researchers raised experiential and ethical issues about how individuals interact with sensing technologies and the associated social support systems (e.g., “support cloud”). Lastly, Newman et al. [13] examined the effects of social networks on weight loss by conducted interviews with people who interact with both online health communities and Facebook. They found that, in contrast to Facebook, within online health communities, it was easier to find emotional support since members were in a similar situation.

Personal preference and accountability were other reasons why online health communities were more desirable than Facebook.

We found no studies that explored the dynamics and interactions specific to weight loss communities. Improving our understanding of these specific types of online communities has potentially large social impacts and could also be helpful to other areas of research. Hwang et al. [5] noted that most primary care practitioners do not refer patients to online weight loss communities because of their unfamiliarity with these communities in general, not because of concerns about effectiveness.

Much of the community design for these weight loss programs are black boxed, making it difficult to describe what factors have the most influence on a participant’s weight loss. These studies have approached online communities as a feature that a weight loss program has or a technology that can be improved. But the connection between health outcomes and user experience within these communities has not been tightly linked. There is still much to gain from understanding the information that is shared and the shape of participants’ activities. Understanding participation in these communities could more effectively link what is known about the design of communities from the HCI and medical perspective can distinguish what design characteristics yield positive results.

### 3. A WEIGHT LOSS COMMUNITY

The technology described in this paper is DropPounds<sup>1</sup>, a popular web- and mobile-based weight loss online community. Originally a mobile diet and activity tracking application, DropPounds quickly became one of the most downloaded “Health and Fitness” applications in the Apple iTunes Store. Two years after its initial release, DropPounds added a web-based version and online community as a companion to the mobile application. Both the website and the mobile application have been through revisions over the past few years. At this point there is effective feature parity. That is, the majority of the features of the system are available in some form through both the mobile application and the website.

Upon joining DropPounds, users create a weight loss plan based on one’s height, weight, activity level, and desired weight loss per week. The plan consists of logging one’s activity and diet to reach a maximum daily caloric target; there is no specific advice given on what to eat or what types of physical activities to do.

In this study, we focus on the online community associated with the DropPounds application. The community can provide additional ways for users to get assistance and support with the weight loss process. The community, which is like many online forums, features eight different forums that cover community announcements, exercise, nutrition, feature requests, technical support, an FAQ, community contests, and miscellany.

When users visit the forums within the community, they see a web page with a list of thread topics. The topics are typically listed based on recent activity, but forum moderators have administrative capabilities that can keep threads “sticky” at the top of a topic list. The moderators can also lock threads, remove or hide posts, or move threads between forum areas.

DropPounds provided us metadata from the online community. This included all thread titles, thread IDs, thread creation dates, total number of posts to the thread, and total number of thread

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1. DropPounds is not the real name of the app or the online community and has been anonymized for privacy concerns.

views. We used the metadata to generate a random sample of threads for coding. In total, we have coded a little over 10% of the total threads represented by the metadata. The technical structure of the forum is based around thread ID. That is, given a thread ID, one can generate a URL (aka “permalink”) to the specific thread in the community. We converted our random thread IDs to this URL structure and used the set of URLs to visit and code each of the randomly selected threads.

#### 4. METHODS

The DropPounds online community is active with over 20,000 threads of discussion across eight different forums. Using the thread as a unit of analysis, we categorized topics of discussion by thread. Although the eight forums are topically named and each thread has a title as well, those names and titles may not correspond to what the participants are actually discussing. Hence our goal in this topical analysis is to understand the “what” and “how” of those discussions.

We created a set of grounded categories by selecting sets of threads and having two coders iteratively create codes and consolidate codes. We started with all threads having over 100 posts (222 total threads). After iterating through creation and consolidation, we had a total of 15 identifiable categories. The same two coders then took all threads having between 80 and 100 posts (92 total threads) to validate and clarify the category scheme. After the team completed coding, the “other” category was quite large (about 8%). The initial two coders reviewed all “other” threads to identify any latent categories not found during initial category creation. This effort yielded two additional categories. The following is a list of our final 17 categories and a brief description of those categories:

**Consumption Choices** - Discussion of favorite foods, drink, cooking, or eating habits such as vegetarian or vegan. Recipes, cooking methodology, and meal suggestions.

**DropPounds Related** - Technical support questions, feature suggestions, or discussion about the DropPounds system.

**Personal Experience** - Sharing stories, opinions, thoughts, rants, or advice. Social support threads, “Attaboy!”, “Attagirl!”, “I hear ya ...”, “Stay strong ...”, “Stick with the plan ...”

**Health Information** - Any thread discussing the medical or health benefits/disadvantages of diet or exercise. Typically users validate claims through external sources or focus the conversation around potential health outcomes. We do not validate the actual healthy/unhealthy claims.

**Fitness Regimen** - Structured fitness programs like P90X, Jillian Michaels, 30 Day Shred, BootCamp, and CrossFit. The program must have some type of progression or advancement between sessions.

**Exercise** - Unstructured activities that do not have an associated progression. Examples include running, aerobics, calisthenics, yoga class, spin class, Zumba, and group sports.

**Dieting Strategy** - Threads that include DropPounds philosophy, covering restricted calorie consumption, techniques such as substitutions, and strategies on how to stay with the DropPounds calorie restrictions. Includes threads of diet programs, or products such as Atkins, Paleo, WeightWatchers, SlimFast, or OptiFast.

**Open Weight Loss/Exercise Challenge** - Community event for all DropPounds forum users with daily or weekly check-ins to reach a defined goal or outcome in either weight loss or exercise. Should be accessible to all participants.

**Team Weight Loss/Exercise Challenge** - Community event for all DropPounds forum users who are part of a team, with daily

or weekly check-ins to reach a defined goal or outcome in either weight loss or exercise. Teams can be preassembled or determined within the thread.

**Gadgetry** - Technology products and apps designed to aid in weight loss and exercise such as heart rate monitors, activity trackers like FitBit or Nike+, mobile and training applications like C25K, Endomondo, ZombiesRun.

**Religion** - Discussion about faith and belief relating to fitness, weight loss, or motivation.

**Networking** - Asking for accountability partners, trying to meet new people, or trying to find similar or like-minded individuals to become friends.

**Love and Relationships** - Discussion about dating, dating websites, meeting others, and relationships between family, spouses, and significant others. How these relationships impact success or failure of weight loss.

**Workout Equipment** - Something that is generally required for exercise. Differentiated from “Gadgetry” in that a gadget is not necessarily a requirement. In this category we specifically include threads on workout clothing (maybe not essential, but is clearly not a gadget), shoes, running shoes, bands, balance balls, and yoga mats. This category includes discussions of video games and video game equipment that facilitates exercise such as Wii, Wii Sports, XBOX, Kinect and associated fitness games, as having the console or game is essential to that specific form of exercise.

**Quotes and Inspiration** - Discussions initiated with detailed individual testimonial, stories about other users or celebrities, lists of inspirational quotes that are taken by the community as inspiring and motivating them to continue their weight loss journey. Responders often say that the post was “inspiring”, “motivating”, or include statements like “you are our inspiration”, “you inspire us”, “your story is my motivation”.

**Team Monthly Thread and Group Roll Call** - Threads created each month for new and existing groups or teams, created monthly as a general discussion for team members. Team threads can have their own separate weigh-ins and challenges which are not Open or Team Weight Loss / Exercise Challenge.

**Other** - Online interactions or banter, generic talk or questions, and any other items not covered by the categories above.

We used a “tail sample” of the most popular threads to create our codes because we presume that the threads which have garnered the most posting activity have attracted the attention and contribution of the DropPounds community simply because the participants are most interested in those topics.

The process of coding threads weighted the named topic of the thread and the initial post most heavily. That is, the individual who starts the thread by naming it and contributing the first post is indicating something of what they want to talk about. The topic of the thread is what other participants will see, and it is likely to be what attracts them to the specific thread whether they just read it or post to it. We then consider one full web page of forum posts to see the topical direction of the thread and whether it is consistent with the initial post or whether the topic drifts to other issues. In the DropPounds forum implementation, the first page of posts to a thread will either be 10 or 15 posts. We did not investigate why the number of posts varies, but for each individual thread, the number of posts in the first page is invariant.

As much as possible, we attempted to code threads into one category, but we allowed for two categories to be assigned if there was a clear second topic. Secondary topics often arise as a function of topical drift. An initial post may start a thread in one

direction but subsequent posts from participants take the thread in a different direction. Only 4.3% of our total sample of threads received two codes. In all of our subsequent reporting, we will report as a function of total codes applied.

**Table 1 – Distribution of codes through all coding categories**

Thread Category	Count	Percent
Personal Experiences	729	27.4
Consumption Choices	393	14.8
Dieting Strategy	261	9.8
Health Information	211	7.9
Exercise	209	7.8
Networking	171	6.4
DropPounds Related	154	5.8
Team Monthly Thread and Group Roll Call	75	2.8
Gadgetry	72	2.7
Open Weight Loss/Exercise Challenge	56	2.1
Fitness Regimen	47	1.8
Love and Relationships	42	1.6
Workout Equipment	33	1.2
Quotes and Inspiration	18	0.7
Team Weight Loss/Exercise Challenge	17	0.6
Religion	7	0.3
Other	168	6.3
Total	2663	100

We coded a random sample of threads using a consensus coding strategy. One primary coder was responsible for coding all threads. A set of secondary coders were given different non-overlapping samples of threads. The randomly selected threads came from threads with metadata indicating that they had from 10-80 posts to the topic. When both coders were finished with a set, the sets were compared for any differing codes. Threads that received different codes were debated between the primary and secondary coders until a consensus was reached. The primary coder acted as the authority control for judgment calls on edge cases. Coding consisted of multiple rounds over a 5 month period. The consensus coded threads were grouped together in a master spreadsheet to be processed by analytical software. We coded until we had surpassed a dual coded 10% sample of the total number of threads (2554 threads, 2663 total codes applied). Table 1 provides the distributions of codes across all of our categories.

## 5. FINDINGS

Among our 17 topical categories, we detail four categories that garnered a majority of the observed codes: Personal Experience (729; 27.4%), Consumption Choices (393; 14.8%), Dieting Strategy (261; 9.8%), and Health Information (211; 7.9%). Understanding the content of these categories and why these categories dominate conversation on DropPounds reveals much about how the community works and what it means to participate.

### 5.1 Personal Experience (729; 27.4%)

Much of the interaction that occurs on the forum is providing social support to others. Indeed, the term “Personal Experience”

inherently covers a broad range of content. Whether it is relating previous experiences a person has had, giving advice to another, or encouraging another user during a moment of struggle, users sharing their own thoughts with each other is the basis of forum interactions. Users often share events, both small and large in significance and often related to their weight loss journey, for other community members to read. Many threads announce personal victories or goals achieved, such as the user in this thread excerpt.

#### Thread 5.1.1<sup>2</sup>

**P#6205:** I reached my goal a few weeks ago! I have never lost weight at such a consistent pace in my life before, so I want to share what has worked for me. Take whatever speaks to you and ignore the rest!

**P#6398:** Absolutely fantastic! Congrats, dear!

**P#6552:** Congrats <P#6205>! What a success story!

**P#6704:** Welcome to the Maintenance Club! Awesome job! (And you are lucky to have a great chef as a husband!)

Posts like these often include a description of the participant’s weight loss journey and offer some advice to others. The community typically replies with a series of congratulatory responses, showing the peer support function of online forums. Social support also occurs in the opposite instance when users are struggling. Participants share their frustrations and conflicts to release stress and to receive encouragement. An example here is of a person who is describing a setback on her weight loss plan while sharing her lack of confidence proceeding forward.

#### Thread 5.1.2

**P#6760:** I've only been on a short time and watching my food intake for a short time. I feel myself giving up because I'm not losing weight very effectively. I always go through these cycles of dieting and giving up. I don't think I have ever achieved a weight loss goal. I would love to lose 40 pounds but I just don't think I have the willpower for it because I love food too much. Today, I was doing well until I went to the dollar store and bought myself a big bag of chips and my husband a big chocolate bar. Later I went home and ate both myself. I'm starting to think that nothing will help me lose weight. :(

**P#6999:** It's a setback, not a relapse.

**P#6904:** Don't give up! I've been there before and it so much easier to just stop than get back on the wagon. But getting healthy is important and you can do it! Do something that will make you feel better about the day like walking or eating a healthy dinner. You are worth it!

**P#6760:** Thank you all! I had a healthy supper and feel a bit better about the day :)

**P#7845:** Way to go, <P#6760>! Just keep at it and keep learning.

Responses are a mix of both reassurance and reminders on how to stay on schedule with the plan. Often users share their own stories

2. All of our example threads are text of the first few posts in order presented. In a few cases a small amount of text has been elided or modified to simplify presentation and clarify the message from users. User names have been replaced with random 4 digit IDs. In all of the examples the same ID always represents the same user.

when empathizing with others, creating a cycle where users can express their triumphs and struggles with one another.

Soliciting opinions on subjective matters about weight loss is also where personal experiences play a major role. The main point can be about whether to log or track atypical exercises, such as housecleaning or intercourse, or the times of day to weigh oneself. With no clearly defined answer, users can receive a wide variety of opinions.

## 5.2 Consumption Choices (393; 14.8%)

One of DropPounds' features is the ability to list what foods are eaten during a day. Successful weight loss through the DropPounds model is a combination of healthy eating and exercise. Consumption Choice threads are characterized by users' suggestions and questions about what to eat for a certain occasion, sharing recipes or cooking techniques for certain items, eating preferences, or favorite meals. Often users are focused less about the health benefits of the meal and focus instead on why the food is good for the situation presented. The example below is a user sharing his favorite salty snack to satisfy his cravings, followed by others sharing their own selections.

### Thread 5.2.1

**P#2324:** My downfall, for many years, has been SDMs (aka Salt Delivery Mechanisms, aka "chips"). Doesn't matter much which kind, potato chip, tortilla chip, Fritos, Doritos, etc. I probably ate the most tortilla chips with salsa over the years as I perceived them to be "least worst" We recently discovered a product named "Veggie Straws". Turns out the company, World Gourmet Marketing, sells a bunch of different products along this line. I understand that it would be better to eliminate SDMs completely...however on those occasions when I want to quench the craving rather than let it build, these seem to be a better choice than the stuff I used to eat.

**P#4409:** My new thing is PopChips. I found them at Target and Meijer!"

**P#2018:** I like the thin pretzel sticks. One 110 calorie serving is typically between 28 (Snyder's of Hanover) and 50 (Rold Gold) sticks. I treat them as my personal salt lick. Also, pumpkin seeds.

In other instances, learning how to cook a certain dish or even simply knowing how to handle a certain type of ingredient is the main focus of the discussion. Here in this instance a user is trying to find out the best methods on cooking buffalo meat. Respondents give general advice as well as asking where to procure buffalo. The discussion results in a recipe being adapted for buffalo meat.

### Thread 5.2.2

**P#4284:** On an impulse I bought a buffalo sirloin steak. How do I cook it? Any and all ideas are appreciated.

**P#4693:** Grill it? That would be my best guess. Try seasoning it with something you like and grill it like any other steak.

**P#2767:** I had steak tonight and tried out a new rub, it was amazing! I'm sure it would work with buffalo as well. Here's the recipe:

1 tbsp. smoked paprika

2 tsp. salt

1 tsp. brown sugar

2 tsp. chipotle chili powder

1/2 tsp. ground black pepper

1/2 tsp. onion powder

1/2 tsp. garlic powder

1/2 tsp. ground cumin

Mix all the spices together and rub onto steaks. Let the steaks sit in the fridge for at least half an hour before cooking. Heat the grill to a very high temperature, at least 450 degrees F (232 degrees C). Grill for 3 minutes, turn, and grill for 3 more to achieve medium rare. Let the steaks rest for five minutes before cutting into them to prevent the juices from running out.

Finally, because vegans and vegetarians are making certain choices about specific foods, discussions around them are placed into Consumption Choice. This includes variations such as pescetarianism. Most users seek to understand the benefits of veganism and vegetarianism.

## 5.3 Dieting Strategy (261; 9.8%)

We call this category "Dieting Strategy" because many of the threads share concrete tips, techniques, and strategies for sticking with a weight loss plan. Since most of these plans require restricting calorie consumption, discussions around restrictions of calories also fall within this category. In this we are drawing a subtle distinction between Dieting Strategy and the concept of "dieting" which the community generally considers an undesirable, short-term practice that is not destined to solve individuals' real problems with weight.

DropPounds emphasizes the idea that healthy lifestyle changes are the key to losing and keeping weight off for the long term. Instead of short-term changes for quick weight loss that is commonly seen in a "diet", DropPounds encourages users to consistently log calories consumed and exercise over a longer period of time. The goal is to facilitate a type of self reflection and practices that reinforce changed behaviors. The following is an example of how DropPounds participants encourage each other to consider long-term weight loss and maintenance as a lifestyle change.

### Thread 5.3.1

**P#5147:** I read all over the internet where people say they gained their weight back! Why is this and how can you avoid it?

**P#3068:** People gain their weight back because they lose the weight and stop trying. The only way to lose it and keep it off is not to diet but change your lifestyle. If you just stop eating and exercising properly then you're going to gain it back. That's why restrictive diets are bad because you need to be able to maintain that eating style for the rest of your life if you want to keep the weight off. If you are restricting yourself too much, it will become too challenging and not much fun. People fail because of these reasons.

The calculation of calorie limits for each person is based on a user's current weight, their goal weight, and the rate at which they want to lose weight. The results of this calculation in the system can generate unusually low calorie limits. As such, many discussions focus on calorie limits and the DropPounds process for losing weight. These discussions will surface safety issues surrounding low rates of calorie consumption. The community raises concerns when individuals appear to be eating so few calories that they are starving themselves. In the following example, the initial poster is asking about why they have stopped losing weight. In the interaction we see the initial poster pointing to the calorie allowance set by DropPounds.

### Thread 5.3.2

**P#1163:** I lost about 15 pounds but stopped. I feel like I've been on a diet for a year with a completely changed lifestyle. Yet I still can't get lower than 124-125 pounds unless I starve myself for a couple of days. I don't understand this. I eat less than or around 1000 calories everyday. Someone help! I just want to lose five more pounds.

**P#1262:** You are probably not eating enough. Under 1000 calories isn't healthy for a person.

**P#1163:** Oh trust me, I eat enough and my budget on this website is 980 calories. I also do ballet for two hours a day.

**P#1434:** How tall are you? 125 pounds is thin to begin with.

**P#1262:** Ask your doctor then.

**P#1163:** 5 feet 5 inches. I want to be 118 pounds. It is still considered a healthy BMI.

**P#1453:** Maybe your goals of "just another five pounds" and "ballet for 2 hours a day" are in conflict? Do you have a coach or nutritionist that might be able to make diet suggestions? Personally if you are really that close to your "goal", perhaps one based on inches or fitness levels might be more appropriate for you since you're so active. The scale is not a great measure of health or fitness and no number on the scale is worth starving yourself.

In this example, the community raises concerns regarding the low calorie rates and asks the original poster to consider other measures of success beyond simply the numbers on the scale. Often the DropPounds community expresses concern about how a new lifestyle is achieved and works to shape participants' attitudes toward techniques and approaches that are more likely to be safe and sustainable.

Many of the threads categorized as Dieting Strategy cover specific strategies that make weight loss successful. During our coding, we observed a range of strategies, many of which can be characterized in two different ways. First, there is a general calorie counting and calorie control strategy, which is the hallmark of the DropPounds approach. The second is a set of substitution strategies that help individuals handle times of weakness. The following two threads illustrate each of these strategies.

### Thread 5.3.3

**P#2070:** What are some views on meal planning? Does it really help keep nutrition on track? How would you even begin one?

**P#4749:** I always plan my meals. I even plan my meal times. When he used to live in the states, my boyfriend would set his clock to 2 hours ahead (so, my time zone), and every 3-4 hours his alarm would go off and he'd text me to eat. (He also followed it for eating purposes).

**P#5819:** I also plan my meals and meal times. Planning my meals ahead of time helps me stay on track and not be tempted to go out to lunch with co-workers or eat those 500 calorie donuts. If I already have my breakfast, lunch, and two healthy snacks, I can control my hunger better.

In this example thread, we see individuals discussing the control of calories by planning meals in advance. Through a planning approach, individuals can more accurately set calorie limits and know what is actually consumed. In other threads, posters describe strategies for substituting less calorie dense foods for

other foods with too many calories. Both of these are key strategies for affecting weight loss and are part of changing long-term behaviors to support effective weight maintenance.

Dieting is a big business. Individuals and organizations spend money to advertise and make a name for their dieting strategy, products, and techniques. Many of these well known products and organizations are discussed by DropPounds participants. Many well known diet companies and products are mentioned. DropPounds does not have a blanket restriction around discussions that mention these other products, techniques, or services, but the community appears to be skeptical about anything that is being sold as the solution to weight loss problems.

### Thread 5.3.4

**P#7082:** I'm new on DropPounds. I was on Medifast for a while last year and lost 60 pounds, but decided to get back on the plan after trying everything else as it was the only plan that I was able to lose weight on. I would like to get down to 149 pounds and at the moment I'm 277 pounds. I started on Medifast again today and would love to find some new friends especially those on Medifast for support.

**P#8974:** I am not on the full Medifast plan but I do always keep a supply of the protein shakes on hand. I find them very handy to use during the mid-morning, mid-afternoon, or if I am running late and need to catch up with breakfast.

**P#8022:** To each his own and if you prefer this method more power to you but it really isn't teaching you how to be a healthy thin person. Learning to eat real food is an important part of maintaining a healthy weight and DropPounds can help you do that if you seriously log all your food. There's lots of support here and all the tools needed to make a healthy lifestyle change.

**P# 4103:** I'm not a fan of meal replacers. They don't teach you how to live once you're off the diet, which is a recipe for gaining that weight back. Thin people don't live on shakes. You need to learn how to live as a thinner person. Forget "plans" to lose weight -- permanent weight loss isn't about plans or diets. It's about fundamental, lifestyle change.

Throughout this category, we see the different facets of Dieting Strategy. We can see how the participants focus on lifestyle, safe approaches to losing weight, and strategies that are likely to help participants become successful. The participants are wary of special diet programs. While they do not block or stop discussions of other structured diets, programs or products, the skeptical nature of responses will squelch discussion. The community is genuinely concerned for the safety of others and will cautiously challenge individuals who seem to engage in unsafe practices. Although we did not see them, there are allusions in some discussion threads to other threads that are hidden, blocked, or otherwise removed because they discuss or promote unsafe activity. The participants in DropPounds do not see magic in weight loss. Members of the community regularly say that the secret to long-term weight loss is to change behaviors to engage in a lifestyle that has a different relationship with food, calories, and exercise.

## 5.4 Health Information (211; 7.9%)

The correlations between weight and a wide range of behaviorally based medical conditions are well established. So, it is natural that DropPounds participants would discuss topics with medical and health implications. This category covered a wide range of topics from simple questions like "How do I manually calculate my heart rate?" to questions about managing diabetes during weight loss to

complex questions that truly require a medical professional. Other aspects of a thread that put a discussion in this category included whether the participants were attempting to leverage evidence, such as a URL, a journal citation, or quoting text from a publication, and whether or not the participants in the discussion were attempting to diagnose something about the person or their situation through the types of questions they asked and the hypotheses they offered.

The discussions of Health Information exist on a dimension and participants are aware of that. As the questions become more complex, we see participants recommending medical consultation. This is not a role for DropPounds; it does not have paid medical staff to monitor the forums. And the forums are not suited to an appropriate medical consult interaction. Further, DropPounds is clear in several places on the website that individuals should seek medical advice when considering weight loss. In this first example thread, we see the threshold of recommending medical consultation crossed immediately:

#### Thread 5.4.1

**P#1546:** I recently started a diet where I am allotted 1,624 calories, but I tend to be only eating 500-600 calories a day while burning 300-500 with exercise everyday. What I am asking is how do I know if my body is in starvation mode? My body has been in ketosis for the last 4 days, and I am taking Phendimetrazine (3 a day) and Calcium Pyruvate (4 a day).

**P#1833:** I think you should call whatever doctor prescribed the Phendimetrazine and discuss with them. From the little amount of information you have given, I think you are eating a shockingly low amount of calories. Also since your case involves prescription weight loss medication, the only person that should be advising you on your diet should be your doctor, and your doctor needs ALL the facts to tell you what to do. I'm sorry that I can't be helpful but in your case I feel that it would be irresponsible to say anything other than to talk to your doctor, and I would do it ASAP.

**P#1833:** After looking into Phendimetrazine, I realized that this is a drug that can be obtained through other avenues than having a doctor prescribe it. If you chose to start this medication yourself, please know that it is chemically very similar to amphetamines, and is considered highly addictive. Similar to amphetamines (such as crystal meth) it suppresses the appetite and keeps you awake. Please, be very careful.

**P#1992:** What the heck are you eating?? (that would only be 2 meals for me) I am not a doctor, nor do I play one in this forum. However as <**P#1833**> stated, I would talk to your doctor. It certainly doesn't sound healthy to me. You may feel healthy, and your blood work may even reflect that, but I would be afraid of the long-term affect to your body. With that being said, I am not a fan of having to take a drug to curb your eating. This raises the question: What are you learning in your own eating habits if a drug is doing the work for you.

I had to look that drug up: so for others that don't (sic) know as well: Phendimetrazine is a sympathomimetic amine, which is similar to an amphetamine. It is also known as an "anorectic" or "anorexigenic" drug. Phendimetrazine stimulates the central nervous system (nerves and brain), which increases your heart rate, blood pressure and decreases appetite. <URL to drug info>

The DropPounds community takes Health Information questions very seriously and often work hard to understand what is happening to another participant so that they can point that

participant in a healthy and safe direction. This is similar to a study by Hwang et al. [6] that illustrated that questions to online health communities are answered with high quality information very frequently. Further, information that was inaccurate or dangerous was very quickly corrected.

Other Health Information threads concern debates about the truth or accuracy of some claims regarding health or weight loss. In this next example thread, we see the participants discussing information that comes from a lecture by a book author. The over 2 hour long lecture is comprised of a sequence of 10 minute videos which are embedded into the DropPounds website by the thread initiator.

#### Thread 5.4.2

**P#2122:** "Why We Get Fat" author Gary Taubes presentation. Hint: it's not because we eat too much and are lazy! <User supplied list of embedded videos>

**P#2267:** Very cool. Thanks for the video links.

**P#1453:** I will point out, as I have on other threads, that Gary Taubes is a great writer but a poor scientist. His conclusions are weak at best.

**P#2122:** Okay, links to back up your statement, please. His book cites references, where's yours? This is serious business.

**P#1453:** Here is one of the links. It clearly shows Taubes' pattern of misrepresenting both the remarks and research when he bothers to cite them at all. <User supplied links to article>

**P#2622:** My perspective is that there is not one approach that will work for everyone. To provide a blanket approach that is supposed to be applicable to us all just doesn't align with my views at all. There's a reason that my husband and I eat such different foods and quantities. There is definitely a problem with obesity in this country, but the result of equal diets does not produce equal results in everyone. Anyone who approaches weight loss as a one size fits all (no pun intended) solution loses credibility with me.

**P#2122:** With all due respect, we are actually talking about studies and facts. No one has credibility with me unless they back up what they are saying with facts. There is the traditional view promoting low-fat calorie restricted diets and there is evidence which promotes carbohydrate restrictions which reduces insulin production that regulates the fat stored in our cells. I think it's very important to get the facts out there regarding a different approach to health for people to see. I'm not presenting anything here that Taubes' hasn't shown where his information is from. If you don't like it, don't do it, but let's start discussing facts instead of beliefs. We all have a problem controlling our weight or maintaining it or we wouldn't be here. There is a lot of beneficial information for people who have not heard it before.

The conversational tone of these debates means that participants do not uniformly support their claims with evidence. Measuring the validity or trustworthiness of claims remains a challenge for many participants, as it is sometimes tough to differentiate between actual science and pseudoscience. Like most online communities, the reader should beware.

Not all Health Information threads are dire. Sometimes questions are important to the asker simply because they want to know about the topic. How the participants interact to understand the question and respond is one type of support that the community provides its members. In this next example, the initial post asks a

question about a pending visit to the doctor, and the community works to figure out a reasonable answer.

### Thread 5.4.3

**P#3111:** I'm getting my blood drawn for a lab workup on Monday. That's also my morning for a long run (4-5 miles). I'm supposed to "fast" overnight as well; that's not a problem. I often run on an almost empty stomach. Is it okay to exert myself prior to getting blood work done?

**P#3401:** Not sure, but I would play it safe and schedule the run for after the stick. I don't know what you're getting checked, but your glucose levels at least would probably be affected by heavy exercise.

**P#3510:** <P#3111>, what are they testing for? If it's glucose, you probably shouldn't. On the other hand, if it's just cholesterol, then it's probably fine.

**P#3111:** They are doing a complete metabolic panel (including glucose), a lipid panel w/ratios, and a CBC.

**P#3510:** You know, I just don't know. Why not call them and ask?

**P#3992:** I'd definitely recommend calling them, though they may not have a clear answer for you either (you might be the first person to ask). That said, given that exercise, especially fairly intense exercise, directly affects the metabolic functions you are testing for and that you are probably looking for a baseline, I'd run afterwards.

**P#3111:** I was going to do that this morning (the lab happens to be on my mail route!) and it was the only day I've ever walked in there with no one in the waiting room and no one at the desk! I'll try again tomorrow.

The question in the example seems very reasonable. People get blood tests all the time and are commonly told to fast before the test, but what about a workout? While we end our example after only 7 posts to the thread, later in the thread other individuals chime in that exercise should not affect the results of the blood tests. This is confirmed later when participant P#3111 returns to the thread to say that the lab staff had said it was fine to exercise but that rehydration with water was important prior to the appointment.

## 6. DISCUSSION AND CONCLUSION

Naturally, the individual experience of DropPounds will vary from one participant to the next. Our study focused on a cross-section of the DropPounds forum as a way to gain insight into how individuals participate in an online weight loss community.

Our grounded topical category scheme provides one way to understand the shape of participation in an online weight loss community. In particular, the category of Personal Experience provides important social support to the participants. Personal Experience comprises a little over one quarter of the forum activity as a function of thread topics (see Table 1). This type of social support is important to keeping people engaged in the online community. Prior studies of online weight loss have shown that staying involved in the community is highly correlated with weight loss [12, 17, 18]. The other prominent categories that we have described above help us to understand the types of topical content that interest individuals in the community. The other high frequency topics include Dieting Strategies, Consumption Choices, Health Information, and Exercise, topics of which seem closely tied to weight loss.

The Networking category is interesting in that it reflects a concerted effort by members to find others who will serve to hold them accountable. In the DropPounds community, the notion of being accountable to oneself is a foundational notion of lifestyle behavior change. That is, in the long run, each person is ultimately accountable to herself for how she behaves and what she does or does not eat. But within this community, there is a need for people to transition from external (extrinsic) accountability to individual (intrinsic) accountability. The Networking category reflects one way the community helps facilitate that transition. Individuals seek accountability partners to help them change their lifestyle.

As a function of reading and categorizing threads, we have come to see a number of interesting aspects of the DropPounds community, which are not directly reflected in the category scheme. One thing is the range of participation roles that individuals take on at different times in the community. There are a few roles that are common to many online communities. DropPounds has "Moderators" who have added permissions in the system and who serve to maintain the social space and curate content among the different topic areas in DropPounds. Moderators are individuals who have been participating in DropPounds for a long period of time and are some of the most senior participants in the community. DropPounds also has newcomers ("Newbies") who join the community and express their inexperience in a wide range of ways. These two roles cross a wide range of other online communities.

DropPounds has a few roles which seem to be a function of the specific type of community. One commonly seen role is the "Shill". This role takes two slightly different forms. As we have mentioned, weight loss is a big business, and there are a wide range of products and services that claim to help individuals lose weight. There are many companies that would want to get their product in front of an audience like the participants in DropPounds. This is known and recognized by the community and the participants make an effort to police this in a reasonable way. Explicit marketing is called out, the account is banned, and the post removed. However, a reasonable question or discussion of a product may not be marketing, and the community is willing to discuss products even though they are often skeptical about any claims. This is the opening that the Shill is working to exploit. In one form, the Shill asks a question: "Say, I've been hearing very promising stories about <product\_X>. Does anyone here know more about this product?" In response, there may be some community members who state that they have never heard about the product or that the product is not well respected by the community. Almost always, following a request for information, the other form of the Shill responds with something like: "Yeah, I love <product\_X>! Here is where I get it for a great price: <link>." At that point, there is often heated discussion about whether or not this is marketing and should be allowed by DropPounds. The Shill will often respond by saying they were not marketing but rather just asking questions or providing information.

Another key role, which is promoted by the very idea of logging all calories and all exercise, is the "Quantified Self" role. We label this role after the broader Quantified Self movement made notable through websites such as quantifiedself.com, because the basic ideas are the same. People in DropPounds are encouraged to log everything. Some participants really enjoy that activity and seek to share the charts that they produce to help others understand the ways that calorie consumption, water intake, exercise, and weight fluctuate over time. Other than studies that have focused exclusively on the Quantified Self movement, we believe this is a



new role that is likely to be found in the wider range of health and wellness online communities.

Identifying roles in online communities is important, but there are a number of states or attributes of participation which we believe should not formally be considered a role. These are somewhat temporary aspects of participation that can be observed in individual posts and are individually transient but persist in the community because different individuals will experience these states or attributes at different times. DropPounds highlights this because of the type of community it is: a weight loss community.

One of the most satisfying and important states or attributes that a person in an online weight loss community can have is what we call "Milestone." This is the sense of achievement and satisfaction stemming from reaching a goal that the individual set. The specific goals vary widely as does the time required to achieve the goals. This means that across a large number of participants there is always someone in a Milestone state. When people declare their Milestone state, the community often reaches out to celebrate and acknowledge their achievements. But for many in the community, Milestone is fleeting because often that state means it is time to set another, different goal.

Two other attributes or states bear mentioning, "Binged" and "Frustrated." In the Binged state, individuals come to the community to declare some type of failing. In DropPounds, it is often a failing due to excessive consumption, a binge. In the case of Frustrated, an individual describes a specific type of problem they have and cannot seem to overcome. In DropPounds, that problem is often a weight loss plateau or no effective weight loss for some period of time. Another common Frustrated state is when an individual declares inability to control consumption of a specific type of food or drink, like chips, beer, or ice cream. Like Milestone, Binged and Frustrated are considered temporary states of being not specific roles in the community.

Another aspect that we have come to see is the different ways that individuals approach the forums. For some people, the forums are more like a static repository of information to be searched. Individuals who come to the forums with this perspective engage these forums thinking something like "surely someone has had this issue/problem before and all I need to do is \*search\* for the answer." This mindset is evident in the wording and behavior of posters in two ways. First, we see some initial posters explicitly say they searched the forum for the content and could not find it. A more subtle version of this mindset is implicated in posts saying that they did not know how to describe something or what terms to call something. This apologetic approach is characteristic of newcomers learning some new domain or new practice [16]. This particular mindset is also evident in the behavior of individuals who are established in the community when responding tersely with a post like "see our FAQ on this topic: <link>."

The other mindset considers the forum as a place to work through an issue or question. These individuals come to the forums with the idea that interacting with people is the way for them to learn and understand what they need to know. These people see the forums as a social information process. They come to the forums thinking something like "surely someone has had this issue/problem before and all I need to do is \*ask\* them for the answer." These posters are more interested in the thoughts of the people who bother to respond.

The main point here is not to claim that a forum should be more of the former or the latter. The real issue is that the underlying assumptions which individuals bring to the forums are cause for a type of problematic interaction. When people come to the forum

assuming it is a social information process and they are met with posts by individuals who assume the forum is an information repository, participants can feel as if the others in the community are brusque, prickly, or somewhat mean. While these conceptual views of forums and newsgroups may not be new, there is still little work that seeks to uncover the underlying assumptions of individual participants to smooth interaction between individuals who come to these discussion spaces with very different conceptual models.

The literature has shown a high correlation between individuals who participate in what an online community has to offer and weight loss [7, 8, 12, 18]. This suggests that efforts to attract participants to the social support, dieting strategies, and health information provided in forums could yield some benefits. Furthermore, the nature of roles in an online community has been explored in previous literature. Maloney-Krichmar and Preece found three primary roles users took in an online knee injury support group: Information Giver, Opinion Giver, and Encourager. These roles are important to facilitate the purpose of the support group to give advice and information to users [11]. The roles we discovered in DropPounds are analogous to some of the roles seen in the knee injury support group such as the role of quantified self being similar to the information giver. Many of the users take on the role of opinion giver in the community due to DropPounds lack of established rules. The Skill role can be thought of as an (unpopular) Opinion Giver. Encourager roles are also seen around the community especially in Personal Experience threads for users slogging through Binged or Frustrated states. The names for the roles may change between communities, but the concepts of information, opinion, and encourager exist in online support forums.

The DropPounds model itself played a role in the types of conversations that were observed. As previously mentioned, a large focus is placed on lifestyle changes through activity logging to achieve weight loss results. There are no set rules or methods listed from the application. This results in many interpretations of "the best way" to lose weight, leading to ideological clashes. This is most obvious in the disdain for product skills and debates around whether quantifying all aspects of the day is necessary. The design of the DropPounds forum also contributes to the types of discussion that occur. Of the eight sub-forums, only two of them are dedicated to certain weight loss activities such as "Fitness and Exercise" and "Diet and Nutrition" while the rest are for teams and miscellaneous discussion. There may be some confusion for users about where to post threads about their personal stories about eating behavior. The online forum system's search function is limited: all results of a specific term are shown but link back to the message where that term appears. This makes finding the original post of the thread more challenging. Certain threads are also permanently posted on the first page of each sub forum, which push down new topics and topics that receive responses to the middle of the page. Users may not immediately find threads pertaining to their interests and post a new thread to discuss their thoughts. This may have inflated the number of observances for certain topic types. These factors may have affected user discussions on DropPounds.

Effective support for newcomers is a common issue in online communities. One approach is to provide a forum space that allows new users to introduce themselves and receive responses from longtime members. By creating a welcoming experience, where newbies can share questions and receive answers from more credible community members, the barrier to participation can be lowered. Connections they make with other users can be

enriched with the logging activity to create active social support. For instance, if the system sees a user fail to participate in any forum, or if the system sees a user exceed his caloric budget for a number of consecutive days, the system could notify friends that the user may be Frustrated or Binged. Friends could then intervene with questions, concerns, encouragement, and motivation, keeping the user engaged.

A more dynamic forum system would likely be needed to implement some of these proposed changes. By adding more options for users to describe their personal stories such as a blog per user, there can be a dedicated space for users to share their struggles and victories with others. These blogs won't get buried by other forum threads and can be viewed by others. These blogs can also be a safer area to share concerns or questions about the dieting process without the entire community chiming in. Combined with a more robust search function and a bookmarking feature to return to notables threads will help make the forum system curate and serve information to users more efficiently. The system could also work to provide more support for moderators. For example, when users ask questions about difficult topics or opaque features of the system, moderators will often just link to an FAQ. This type of response will result in some users feeling disconnected from the peer support that the community offers. Providing moderators better tools to tailor responses to each user could alleviate misunderstanding about the goals and role of moderators. Drawing on the user's weight loss progress and combined with sentiment analysis, a tool could suggest different responses that might address the user's issue more effectively. The goal is not to automate a response but to provide community moderators means to increase social support engendering a desire to return to the community.

This study has focused on the qualitative participation in one successful online weight loss community. Through a topical content analysis of the online forums, this study has shed light on the issues participants face and the types of activity that occur. Though the benefits of an online community have been previously documented, our work shows the many facets of user participation. We describe some of the significant content, how the community engages that content, and different roles that participants take. We identify a set of transient states, which are not proper roles but are significant in an online community where individuals are attempting to change their own behaviors. Lastly, we have provided concrete suggestions that could increase participation and engagement in an online community related to weight loss and healthy activity.

## 7. ACKNOWLEDGMENTS

We would like to acknowledge all of the participants of DropPounds. We have worked hard to describe their struggles and their successes. The work would not have been possible without support from FitNow Inc. We acknowledge the comments and reflections from the reviewers which we believe has improved the paper.

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