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ABSTRACT
Human-Computer Interaction (HCI) research typically studies behavior change by measuring behavior outcomes, but this is not always feasible nor the only way to study persuasive technologies. Understanding how users interact with and integrate persuasive systems into their daily lives can also guide the evaluation of such systems. Often times, theories about behavior change in persuasive systems lack contextual specificity, which is why this study explores the online courses of Lifted to understand behavior change within the context of online health coaching. Four coaches and eight users were interviewed about their interactions and perceptions of Lifted’s online health coaching platform to help understand which features of the course platform support user retention. Key features identified as persuasive were those that supported personalization, sense of community or users’ commitment to the course. In the future the identified themes and features can tentatively guide the development and design of online health coaching platforms.

Author Keywords
Online coaching; health; wellbeing; behavior change; persuasive technologies.

INTRODUCTION
Lifestyle related health problems have become prominent in western societies. Sedentary lifestyle accompanied with high calorie low nutrient diets has led to an increase in obesity and related chronic diseases such as type II diabetes and hypertension. In addition, mental health problems widely affect the public health. According to WHO depression is the leading cause of disability worldwide [38].

In 1946 WHO declared health to be a “state of complete physical, mental and social wellbeing, and not merely the absence of disease”. Most people never achieve such state of wellbeing, so they are always looking for ways to improve their health. Their efforts are often called preventative health [28]. New movement forms, diets and wellbeing practices such as mindfulness meditation or gratefulness journaling are introduced and recommended to us on daily basis.

Traditionally, people have relied on self-help or professionals like personal trainers, therapists and coaches, when they are seeking to change their behavior to achieve better health and wellbeing. Faster and cheaper internet access and technological advancements in video calling, sensor technologies and online education platforms have allowed health professionals to distribute information and follow, contact and coach their clients more efficiently. One of the fields that has emerged is online health coaching.

Online health coaching relies on persuasion. Persuasive technologies aim to change people’s behavior or attitudes through persuasion and social influence. Such systems are not limited to health and education. Any system trying to persuade its users to do something can be thought of as persuasive [7].

Advancements in smartphone and wearable device sensing combined with persuasive feedback have brought us a generation of health and wellbeing products from both academia and industry [3,22]. Much of the HCI health related research has focused on such systems. The assumption and hope is that when people monitor their everyday life they will be able to trigger behavior change and assume more control and responsibility over their health [22]. Unfortunately, tracking technologies face a mountain of challenges from data sparseness to reliability of the measurements and lack of actionable feedback [3, 8, 20, 24, 32]. Data can also have an opposite effect on self-improvement and lead to anxiety and stress instead [6].

It is well known that people rely on and benefit from coaching in variety of situations from fitness to career development [39]. The main focus of industry and academia has been on automating that coaching, i.e. creating technologies that independently coach their users, so questions about persuasion and behavior change in online coaching remain unanswered.

Lifted is a Finnish startup company that offers online health coaching courses to individuals and companies. The courses consist of daily modules in the five areas of wellbeing in the Lifted method: movement, nutrition, stress & recovery, mind and social life. The aim of the courses is to efficiently improve the holistic health and wellbeing of the course participants. Professional coaches have developed the courses, and they are delivered via an online course platform called Campwire, which is the largest online course platform service in Finland [21]. Campwire hosts over 1.400 online courses [19], and Lifted has thus far coached over 15,000 people on their platform [21].
In this paper Lifted’s courses are used as a case study to research what features support users’ behavior change in online health coaching. Through user and coach interviews this study aims to understand user perceptions and use patterns in online health coaching to find out how an online health coaching platform can support its users in completing a course and applying its lessons in their daily life.

LITERATURE OVERVIEW

Digital behavior interventions are designed to support people in changing their behavior for the better [23, 26]. Systems that use such measures to shape, reinforce or change behaviors are called persuasive technologies [12]. Persuasive technologies make a desired behavior such as maintaining healthy or environmentally friendly lifestyle or buying a certain product easier to achieve [4].

Persuasive technologies need to boost either motivation or ability. If the user is not sufficiently motivated to perform certain behavior, behavior change will not be successful [12]. Motivation gives direction to people’s activities, but it is not constant, so it may fluctuate during a health intervention program. It is influenced by many factors such as attitude, personality, mood and progress. Many features in persuasive technologies like reminders, compliments, feedback on progress, encouragement, awareness of progress, self-responsibility or rewards may support motivation [5].

Online courses

Lifted courses are one type of Massive Open Online Courses (MOOCs), since they include usual MOOC components like short video lectures, quizzes, automated peer or self-assessments and forum for peer support and discussion [13]. Campwire provides most MOOC components besides a forum, but Lifted uses private Facebook groups instead for open discussions and peer support [15].

The biggest challenge MOOCs face is user retention [36]. Therefore, this study aims to examine features in Lifted courses that support it. According to Volery & Lord [37], critical success factors in online education include technology related attributes, such as reliability, quality, medium richness and ease of use, instructor characteristics like their teaching style and encouraging interactions, as well as student characteristics like prior experience with online education and technology, motivation and self-discipline. Also, timing and appropriateness of coach feedback as well as amount of course-related communication has been found to impact students’ attitudes and hence, retention [33].

Coaches help their clients to find the motivation needed for behavior change by offering feedback and perspective, like explaining that there are numerous ways to achieve a goal [39]. According to Baker [2], coach presence is beneficial for student engagement, motivation and overall satisfaction in online courses. It enhances the experience of supportive environment and predicts student learning outcomes, cognition and motivation.

Gamification

Another way to improve user retention and engagement in MOOCs is gamification [36]. Deterding et al. [9] defined gamification as use of game design elements in non-game contexts [9]. HCI research in gamification of health includes topics like serious games, pervasive games and exergames [9, 35], but there are many kind of game elements that can be implemented in non-gaming systems. Use of game interface design elements like points and badges is the most popular gamification approach, and it offers promise in improving user engagement in non-gaming systems [9]. Effectiveness of health games is currently not predictable, but they hold potential and are being implemented in systems from pervasive technologies in hospitals to fitness applications [10].

Personalization

Personalization is based on the idea that person’s innate attributes affect their behavior and interactions, so that generic interventions might not be as effective as personalized ones [29]. Thus, personalizing the user experience based on user’s interest, preferences or other user data enhances the experience for the user [4]. The most basic personalization strategy is for users to self-report relevant traits, but due to advancements in sensor technologies and other tracking technologies, system-driven personalization is becoming more common [29].

While both personalized and persuasive technologies influence users’ behavior, the influence increases significantly if the two are combined into personalized persuasive systems. Many systems fail to provide personalized persuasion based on user characteristics, but the persuasive research community knows the potential of it. For example, the importance of delivering tailored feedback has been proven and broadcasted well, but other measures such as personalizing the message, interface or the intervention itself could be exploited better in persuasive technologies [4]. According to Berkovsky et al. [4], the online context provides new possibilities for novel persuasive strategies for personalized persuasion.

Community

Social support enhances health and wellbeing of people by meeting a basic human need, and social networks can facilitate that support [16]. There is moderate evidence that health interventions that incorporate social networking are more effective, but more research is needed [11, 14, 16, 25]. For example, interventions using existing social networks such as Facebook appear to sustain engagement in health interventions better due to their naturally higher level of user retention and engagement, but strategies for how to maximize that level do not exist [25].

According to Baghaei et al. [1], social features increase user
engagement with health educational content. In their study users spent second most time by viewing and contributing to the course forum, where the course community supported each other. The participants of the study spent most time viewing educational content. Besides forums other common social features in health technologies are leaderboards and challenges [11].

Recovery from addiction such as alcoholism is an example of radical behavior change, and 12-step approach to reach that change is supported by research and the medical community. Community is a big part of the 12-step program, both offline and online [40]. In the program it is crucial for the participants to identify with others. Newcomers are assured that change is possible while older members get perspective [30]. According to Nylander [30], study participants’ motivation to change was directly linked to their engagement in the community. Nylander [30] concluded that we should design elements that increase sense of belonging and contribution to persuasive health technologies.

Designing and evaluating persuasive technologies
Designers of persuasive technologies build their systems upon behavioral theories such as goal-setting theory or transtheoretical model of behavior change i.e. giving rewards for performed behavior. There are over 100 research papers in CHI proceedings about behavior change, most of them from 2010s [17]. In a recent taxonomy of behavior change techniques, 40 different strategies for behavior change were identified from providing information on behavior consequences to stimulating anticipation of future rewards [27].

Using behavioral theories effectively in persuasive technologies is not trivial for several reasons. First of all, the theories lack contextual specificity and they should be seen more as “design hypotheses” [17, 31]. Therefore, in this study behavior change is studied in the specific context of online health coaching. Also, most behavioral theories only explain a small part of variation in behavior outcomes. Often the theories are not falsifiable and sometimes they contradict each other [17].

Oinas-Kukkonen & Harjumaa [31] proposed a systematic framework for designing and evaluating persuasive systems. It consists of 28 principles i.e. system features or software requirements divided into four categories: primary task support, dialogue support, system credibility support and social support. Some of the principles relate to content and some to functionality. This framework is discussed in the light of the results of this study.

Generally, reviewers of persuasive technologies want to find out whether people’s behavior really changed in long-term, but often it is not feasible to conduct such studies. Especially studies examining new technologies under development cannot be long-term i.e. from months to years, if the technologies are supposed to get launched. On the other hand, there is no guarantee that behavior change observed during shorter studies ranging from few weeks to few months stay in long-term [18].

Therefore, Klasnja et al. [18] suggested other effective ways to study persuasive systems. One of the suggested methods is understanding use. According to Klasnja et al. [18], evaluations that lead to deep understanding of user perceptions and use patterns will help us design systems that better fit in people’s lives, which in turn are likely to be effective in persuasion to the targeted behavior change. Questions like “what aspects of the system are helpful or frustrating” and “what other things could the system do” can lead these evaluations [18]. This study applies the understanding use method to evaluate the online courses of Lifted.

METHOD
This study aims to find out what aspects of Lifted’s online courses on Campwire platform support users’ behavior change through understanding the features that help them to complete their course and apply its lessons. As suggested by Klasnja et al. [18], this study tries to develop a deep understanding of how Lifted courses are used and how they fit in people’s lives. This understanding is developed through semi-structured interviews with Lifted’s coaches and clients i.e. their users.

Semi-structured one-hour interviews were conducted with all four Lifted coaches. The themes discussed in these interviews were the joys and frustrations with Campwire, how the coaches themselves use the platform, what other services they need (i.e. Facebook, Google Drive) besides it and what they wish the platform could do in the future. Coach interviews were conducted to get more perspective into online health coaching and the future of it. The coaches use the platform and are in contact with their clients on daily basis. They have professional insight into which direction the field of online health coaching develops, and which aspects of their courses work well and which need to be developed further.

Eight semi-structured user interviews were held in coffee shops and the Lifted office in Helsinki. Participants picked the meeting spots. The interviews lasted from 30 minutes to one hour. Lifted provided a list of 20 customers handpicked to be diverse in age, gender, fitness level and occupation from all of their courses. They all were contacted. Eight of them were available for an interview in Helsinki during the study period. All eight participants said that their health and wellbeing got subjectively better during the course(s) they participated in. See other details of participants in Table 1.

The interview sessions included a usage demonstration of one of the Lifted courses on Campwire, if the participant still had access to their account and was able to bring the device they used with them (five out of eight). Participants demonstrated how they would navigate to the platform, find an old module they liked and what they would do after
finishing the module (see Lifted course overview in Results for details). Usage demonstrations were conducted to reveal hidden use patterns and perceptions of the platform, which might go unnoticed in interviews.

<table>
<thead>
<tr>
<th>Code</th>
<th>Gender</th>
<th>Age</th>
<th>Lifted course</th>
<th>Occupation</th>
<th>Prior knowledge</th>
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<tr>
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<td>F</td>
<td>40-49</td>
<td>3 x FIT</td>
<td>communications</td>
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<tr>
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<td>High</td>
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<tr>
<td>P3</td>
<td>M</td>
<td>30-39</td>
<td>LIFE-STYLE</td>
<td>carpenter</td>
<td>Avg</td>
</tr>
<tr>
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<td>30-39</td>
<td>3 x FIT</td>
<td>teacher</td>
<td>Avg</td>
</tr>
<tr>
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<td>F</td>
<td>50-59</td>
<td>3 x FIT</td>
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<tr>
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</table>

*on health and wellbeing (low/average/high)

Table 1. Participants

The semi-structured interviews with users included personal histories from Lifted courses and themes like context of usage, Campwire as a platform, coaching materials, Campwire discussions, workout tables, email notifications, Facebook group and personal goals, individuality and future of the coaching. Also participants’ backgrounds with health and wellbeing services, health tracking and online courses were discussed. User interviews were conducted to develop deep understanding of user perceptions and use patterns in online health coaching.

All interviews were transcribed and open coded using the general inductive approach described by Thomas [34]. Codes were created inductively, when new themes were identified in the transcripts. Most themes described different features of the course platform. Five categories emerged from the analysis of the themes: general system attributes, personalization, community, gamification and commitment.

RESULTS

Results are presented here organized into six sections: Lifted course overview, general system attributes, personalization, community, gamification and commitment. Last four sections are feature categories that emerged from the analysis. They consist of different system features that support the theme at hand. The four interviewed coaches are referred to as C1-C4 and the interviewed users as P1-P8 according to Table 1.

The results are limited to features that support existing users in completing Lifted courses and applying their lessons. Reasons for joining a course are not discussed. Achieved changes in behavior are not presented in detail, but all interview users experienced some positive health behavior change. The degree of the change varied from participant to participant. Even though coaches and some participants noted that the most important part of an online course is its content, this study omits all content related interview material to focus on the platform and features that could be replicated in other online health coaching systems.

Lifted course overview

Currently Lifted has three different online courses for individuals: Start (one week), Lifestyle (one month) and Fit (two months). Each course consists of daily modules i.e. lessons (see Figure 1) in one of the five areas of wellbeing in the Lifted method: movement, nutrition, stress & recovery, mind and social life. Start and Lifestyle courses can be started at anytime, but Fit course has a collective start four times a year.

Course participants receive email notification on all new modules every morning. The modules consist of videos, images, text, audio and questions. Each module ends in a discussion related to the topic of the module. If the user participates in the discussion, one of the Lifted coaches will reply to them. Users are encouraged to comment each other’s posts, too. They are also encouraged to be active in
Figure 2. Shared workout table to mark exercises done

the private Facebook group of the course, where they can post questions or greetings such as pictures of their workouts or meals. Once the user has completed a module, they can mark it done, and if it happens to be a workout they can add it to the workout table (see Figure 2). From the workout table users can follow their own progress as well as others’. Users add 1 to the column of that exercise/day on their own row. In the last column they can see the total of completed workouts.

General system attributes

Three fundamental system attributes not specific to online health coaching came up in the interviews. They were reliability, compatibility and intuitiveness. According to the coaches reliability is the most central part of an online health coaching platform. Both users and coaches need to be able to access the system and its content at any time with all kinds of devices. The participants used devices from laptops and smart TVs to phones and tablets to access their course. Thus, contents of each course page should be adapted to screens of all sizes. All participants found Campwire platform easy to use, i.e. intuitive. They had no trouble navigating the courses. On the other hand, coaches noted that because Campwire interface is so simple, all content looks the same (see Figure 1). C4 thought that users could benefit from a view, where essential content for that moment is highlighted.

Personalization

Features presented in this category make the user experience feel more personal and hence, support users’ engagement and motivation. According to C3 best online courses take people into account as individuals, so that everyone can solve their own problems. C4 added that in the best-case scenario personalization of the coaching helps users improve in a pace that is natural for them.

Feature: categorization According to C3 and C4 Lifted courses are meant for the masses, so they cannot be 100% fit for everyone. They argue that few levels i.e. content categories based on user’s previous knowledge, fitness or goals make the user experience sufficiently customized.

P1 said that an online course feels personalized enough, when there are levels in workouts and few general goals to choose from. P4 agreed that Lifted courses were adequately personalized, because she could choose a level in workouts. P4 and P6 mentioned that they enjoyed seeing all levels at the same time, as it depended on the day, which level they were able to perform at.

On the other hand, P7 struggled with categorization. When she felt that there was no category for her among meal plans, she felt left out. Also, when she got to choose whether to follow higher or lower level fitness workout plan, she chose the harder one, even though she was not prepared for it, and should have taken it easy.

Feature: coach replies Lifted coaches aim to have personal contact with all their clients by replying to all user messages on the platform i.e. in the discussions in the end of each module. C2 describes her process:

“I adapt my answers based on the comments of the user, as my lively personal style might not be well received by everyone. For me it’s important to see the communication style of the user and I cannot do that if they don’t write anything. The most important part [of coach replies] is that every participant feels heard and understood.” (C2)

P4 thought that the best part of the whole platform was the discussions. She said that replies from coaches encouraged her to try again the next day, when she felt insecure or stuck. P8 said that the coach replies made it feel like the coaches were present at all times. P5 loved the replies:

“It was nice to receive feedback no matter what I wrote”. (P5)

On the other hand, P1 and P7 were sensitive when it came to the replies. If the reply did not seem genuine, they felt disappointed.

Writing replies to users is the most time consuming task for Lifted coaches. Since Lifted coaches have user messages in multiple courses in multiple modules, which they have to open separately to write back, a message overview would make their life easier. All coaches agreed that user messages should be collected in one view to make the process more efficient, which in turn would mean faster and more reliable coaching service for the users.

Another feature the coaches wished for to support replying to user messages was a user profile view with basic
information such as weight and height, previous discussions with the user, visualization of user’s progress in the course, reported injuries or other conditions and the goal of the user. Such profile view would make the coach replies more specific and hence, enhance the personalized user experience by addressing user’s problem areas and interests.

**Future feature: pacing of material** New modules in Lifted courses appear daily. Some users were so excited for the new material that it was the first thing they checked every morning (P1, P5, P8). P3 and P8 mentioned that it was very important to them to receive new material daily, as it kept them motivated. P8 had been on another online course, which sent material few days every week, and had forgot that he was on it. On the other hand, P1, P2 and P5 wished they could have regulated the pace of the material themselves. They would have benefitted from a personal pace. C2 hoped that in the future the pace of the courses could be adapted based on how many times a week a user wants to and can commit to the course to further increase user retention.

**Feature: support for behind fallen** Users that have fallen behind in a course are contacted by one of the coaches once or twice during the course to see if they are experiencing problems and to give them support. Coaches hoped that in the future that process would be automated.

Getting sick or injured was one of the two most common reasons to fall behind. The other one was hurry. An injury or sickness affected user’s motivation. P4 describes her experience:

> “When I got injured, I basically dropped out. I could have studied the other material and participated in discussions, but when I could not do the workouts, my motivation vanished.” (P4)

P6 wished that the system had taken into account his absence in the pacing of the material:

> “After my illness I continued from where I had been, but the material kept coming so it annoyed me that I had to figure out myself what was next for me. I didn’t want to skip anything, but luckily there was slack time in the end so I had time to finish the course.” (P6)

**Future feature: health tracking** C2 and C3 talked about health tracking, and how the courses could in future adapt automatically based on the data collected of user’s way of life and their habits. C2 highlights the potential of health tracking and some of it risks:

> “It [health tracking] is not so big trend yet, but more and more people are becoming interested in biohacking. It would be awesome if you could have all your health data automatically collected: how well you slept, how you recovered, how you fulfilled your macro- and micronutrient needs, how much you have exercised, etc. But I’m afraid that people will lose touch with their bodies, and not understand any of its signals anymore.” (C2)

Currently, none of the participants was intensely tracking their life. Some of them used activity trackers (P1, P5, P7) and some used some kind of tracking app on their phone (P1, P3, P6, P7), but no one used the data they collected more than checking it for fun occasionally.

**Community** Half of the participants thought that Lifted community was really important for their coaching experience (P3, P4, P5, P7). P7 explained that the best part of the community was the contagiousness of the excitement. For three others (P1, P6, P8) the fact that there were others participating in the coaching with them was a nice bonus, but for P2 the community did not matter at all.

**Feature: open discussion Facebook group** The Facebook group was seen as encouraging and motivating. P4 said that the group was interactive and the discussions were interesting. P6 explained that people encouraged each other, and no one was hateful. According to P7, the whole experience would have been different, if she had not posted pictures and discussed in the Facebook group. P3 needed the group more than others:

> “It was really good [to have the group], because I don’t have many health interested friends, so this gave me the sense of such community and the feeling that I belong to some group.” (P3)

P1 mentioned that Facebook is a natural place for seeking advice and sharing feelings, so the group worked well in her opinion.

Some participants were not active in the Facebook discussions, but they still enjoyed following and liking others posts (P3, P6, P8). P3 said that he was too shy to participate in the Facebook group the first time he took part in Lifted coaching, but seeing others posts and the reactions they got made him start posting on his third Lifted course. P6 who did not post anything, said that he did not feel there was any barrier to it.

The coaches mentioned that the activity level of the Facebook groups varies from course to course, but in the latest Fit courses peer support has been very strong. They said that it is easier to create engagement and the sense of community in the Fit course, where everybody starts at the same time compared to the other courses. The coaches had also noticed that if the number of participants in a course is too low, the discussions are not active enough to create interest and the sense of community. One participant, P7, mentioned that she has sometimes refrained from posting in less active groups to avoid annoying others with her constant activity.

**Feature: module specific discussions** Six out of eight participants answered most of the discussion questions in the end of the modules. Even the two participants (P3, P6), who did not answer read others entries. P5 noted that it was
important that the discussions were bound to the lectures i.e. the modules, so that they had context. P7 explained her experience with the discussions:

“When you are doing the module, you read all the comments. It makes it interactive. The ability to comment is very important to me.” (P7)

P2 did not find the discussions necessary. She enjoyed answering the questions herself and getting replied by the coaches, but did not wish for any peer support. She said she was selfish about the coaching that way.

Coaches C1 and C2 mentioned that it is important that users see each other’s questions and answers to minimize repetitive work for the coaches and to strengthen the sense of community for the users.

**Feature: workout table** The workout table and a similar table for weekly homework in the Fit course have been designed to keep participants accountable, to increase their commitment to the course, as well as support the sense of community according to C1. C4 noted that it has been shown that marking something done releases dopamine. On the other hand, C1 pointed out that if a participant falls too far behind the others, the social pressure might get discouraging.

All interviewed users marked their workouts to the workout table, but used it in very different ways besides keeping it as a training diary. P5 and P2 used it as a reminder where they were in the course. The workout table made P1 feel more accountable, but she wished that the coaches would have commented on her progress. P7 used it together with her own system to keep her motivated. She marked a smiley face on workout days and “R” for rest days in her calendar. Blank days gave her bad conscience.

For P6 marking something done felt like a reward. Sometimes he would also be curious to look which participants were doing well and which had fallen behind, but not to compete or compere. Only P4 used the workout table in a gamified way, since he felt challenged and motivated by the total number of workouts he and others had completed. He was aware how many workouts the leader of the group had in total and how much he had left to match that number.

**Gamification**

Besides P4 using the workout table in a gamified way, Lifted courses do not include any gamified elements. The coaches were also keen to note that they do not want to introduce competition among the course participants, even though it might increase engagement and retention for some users. The coaches felt that some users would feel discouraged and that competition was not in line with Lifted’s goal to help people achieve long-lasting behavior change. The coaches wanted to introduce simpler gamified elements like achievements instead.

**Future feature: progress visualization and achievements**

According to C2 visualizing users’ progress in an online course and changes in their health state would motivate users by making it concrete for them how much they have already benefitted. C4 added that visualization is important since people often forget how much they have progressed, and only think about how much they have left to achieve. C2 noted that some visualizations could also increase the engagement in the community like a “hours sweated” counter, to which everyone contributes to.

None of the interviewed users mentioned gamification, any related concepts or a need for progress visualization. They all thought that they were able to track their progress well enough using their own methods, such as noting fitness test results in a notebook.

**Commitment**

Ultimately all online coaching features are designed to support users’ commitment to their course. For example, community features support commitment by making it more fun, engaging and interactive to come back by exploiting the human need for social interaction and support. Features in this category support commitment more directly.

**Feature: email reminders** All coaches though that it is important that users get some kind of reminders that they are participating in an online course. C3 said that it does not work that user logs in once and then comes back when they happen to remember. C1 noted that although the reminders could be optimized in future by altering medium, content or timing, the most important thing is that there is a reminder.

Most participants found it easiest to navigate to the modules through the daily email reminders. They thought the reminders were necessary to their retention. P3 had been on another online course where no reminders were sent and noticed that he did not remember when he last had checked that platform for new material.

Besides navigating to a module, P2 and P5 used the emails to track and find course material. They kept the modules they had not completed as unread messages and used the email search functionality to find old modules they wished to visit again. The done-undone marking of modules exists in Campwire, but search functionality does not.

P1 noted that it was necessary to get email notifications of coach replies as well, so that she could directly navigate to the discussions once the coaches had answered. Campwire does not offer notifications functionality.

**Feature: timetable** According to C4, timetable helps participants to plan ahead and incorporate the online course to their daily activities better. Lifted workout timetable includes the name, type and duration of the exercise and the theme of that week. Half of the participants mentioned that they benefitted from the timetable greatly, even though no question about it was posed. P1 said:

“It was easier to plan and be less confused after first week,
when we got the timetable for the rest of the coaching” (P1).

The coaches wished that the timetable could be visible in the main course view in the future. Currently it is delivered as a PDF to all participants.

**Feature: time limits** Lifted course material is accessible to users during the course and for one to three week slack period after it. According to C2, users start thinking that they have time and never get to it, if they do not have time limits on material. Time limits create positive pressure for users.

All participants completed nearly every module in their courses. Only one participant (P4), who got injured during a course, dropped out, but even she eventually came back for another Lifted course. No participant complained about having too short access to the material, but five out of the six participants, who had participated in Lifted Fit course wished to subscribe to Lifted workouts after completing it. At the time of the study such service was not available, but has been launched since then.

**DISCUSSION**

Online health coaching can be regarded as a persuasive technology, since it persuades its users to do a variety of things from exercising in a certain way to buying certain foods and supplements. The system also persuades its users to come back to the course, in Lifted’s case every single day for the duration of the course. Additionally, Lifted’s system persuaded seven out of eight participants in this study to rejoin the same or a similar Lifted course again. Hence, those participants must feel that they are benefitting from the coaching, but the question, “Do they really need it?” must be raised.

It can be argued that online health coaching industry is built upon people’s aspiration to change themselves. Furthermore, online health coaching is a type of preventative health measure, so as the term indicates it is for preventing disease rather than treating anything. Therefore, we must be aware that our society might be in some way maintaining or promoting an unhappy self-image, so that healthy people feel that they need services like online health coaching.

On the other hand, we should trust people to make their own decisions. The results that make people happy or help them enjoy their life more should be enough to validate a persuasive system, no matter if the results are subjective or objective. Consequently, it makes sense for persuasive systems to be evaluated by their outcomes, but as suggested by Klasnja et al. [18] persuasive systems should be studied in various ways, which is why the focus of this study was on the features that affect persuasion rather than the outcomes. In this study it was given and assumed that the outcomes were positive in their nature.

Also, it must be noted that no qualifications are required to set up an online health course, which places enormous responsibility on the providers of the course to “do the right thing”. There is always a risk, even unintentional, of designing a system that persuades its users to do things that are harmful for them. Some might consider persuading others to be unethical. On the other hand, there are no persuasion-free societies, so it can be argued that we should keep persuading users to do things that are beneficial for them and the society in general, as there are things that do the opposite. Health can be regarded as one of the beneficial things. Healthier people are more productive and cost less for the society by being sick less.

Health and access to healthcare are basic human needs unequally distributed even among the western population. Uneven access to preventative health measures can be regarded as a social sustainability issue [41]. On the other hand, online health coaching providers are targeting the mass market, so the coaching could be seen as a measure trying to increase social sustainability related to health. If people manage to prevent illness by taking care of themselves in a different way, they might avoid other health related social sustainability issues such as unmanageable cost of treatment for example.

**Evaluation of the course platform**

The results of this study replicate some of the findings of Volery & Lord [37], such as technology related attributes like reliability, quality and ease of use being critical success factors in online education. The instructor immediacy and amount of encouraging interaction with students was also important for the participants of this study, but the teaching style of the coaches did not affect user retention or their motivation. Study participants were happy about all authentic responses from any of the coaches. Additionally, prior experience with online education and technology did not affect the success of participants in this study, unlike proposed by Volery & Lord [37].

The framework Oinas-Kukkonen & Harjumaa [31] created for designing and evaluating persuasive systems partly reflects the concepts that emerged in this study. Major difference in this study compared to their framework and many HCI studies about health and persuasive technologies is that content features were kept separate from platform features, and are not presented or discussed. For example, reduction of complex behavior to simple tasks (principle 1) or suggesting certain behaviors (principle 11) are realized in the content of Lifted courses rather than the platform. Also, some principles like social learning, social comparison and social facilitation (principle 22, 23 and 25) were actualized in the same community features of Lifted courses, and could not be separated from each other based on the results of this study.

Furthermore, some principles like system credibility principles or public recognition (principle 27) did not emerge in the interviews, even though they exist in Lifted courses. Naturally, some principles that are not applied in
Lifted courses did not arise in the interviews either. For example, system imitating users (principle 12) or promoting user cooperation (principle 26) are not part of the online health coaching of Lifted.

Three principles from the framework [31] somewhat contradict with the findings of this study. It can be argued that rehearsal of health behavior (principle 7) is unnecessary feature in online health coaching. There is no meaningful way of rehearsing a health behavior like exercising or cooking a certain meal without actually doing it. Secondly, nothing indicated that the system should adapt a social role (principle 14). The interviewed Lifted users appreciated the human authenticity in all communication, and wished for even more coach contact. Furthermore, the coaches did not want to introduce any competitive elements (principle 27) to the courses, because they could greatly disadvantage some users.

**Feature categories**
The four themes i.e. feature categories that emerged from the interviews were personalization, community, gamification and commitment. Motivation, although an important theme in behavior change and persuasive technologies, was not identified as a separate theme in this study, because many features in the different categories support it, just like Beun [5] indicated.

**Personalization**
The theme of personalization was central in both coach and user interviews. Results of this study support the claim of Berkovsky et al. [4] that personalized persuasion increases the impact on users’ behavior change compared to generic persuasion. Especially coach messages and coaches’ efforts to answer each user taking into account their communication style, goals, challenges and interests is an example of such personalized persuasion. The online context, like Berkovsky et al. [4] predicted, provides novel opportunities for personalized persuasion. Such opportunities identified in this study were personalized pace, automatic support for behind fallen and potentially personalized based on users’ health data.

On the other hand, there seems to be a limit to how personalized the system should be to maximize users’ behavior change. Based on this study it seems that leaving the choice continuously to users to choose how to personalize their experience is the best strategy to increase their retention. Also, providing few categories instead of unique experiences for each user is more feasible for the creators of the coaching.

Personalization touches the very important ethics issue; privacy, which was not specifically discussed in the interviews of this study, but neither did it naturally emerge as an issue in any of the interviews. The more the user experience is personalized the more data the system needs to track and store of each individual user, especially if coaching will be in future personalized based on users’ health data. The potential exploitation of private health data might not currently worry a big part of the population, but once some kind of crisis occurs the attitudes of the public might change quickly. Thus, developers of any health related systems should always take privacy into account from the beginning to secure the trust of their users in long term.

**Community**
Community features were found important in supporting user retention in this study, which is in line with the findings of multiple studies [1, 11, 14, 16, 25]. Interestingly, coach presence in the community also increased users’ engagement in it, which is similar to Baker’s [2] finding about community’s impact on student engagement in online education. On the other hand, unlike Nylander [30] suggested, the motivation of the participants did not seem to be affected by their degree of engagement in the community. In this study, half of the participants felt neutral about the community features and did not engage in the community, but were still motivated to complete multiple Lifted courses.

Another aspect to consider is the balance between personalization and community features. Features like individual pace might decrease users’ engagement in the community. Results of this study suggest that it is easier to engage people in the community when they feel that they are sharing the same experience with each other.

**Gamification**
Like many others, Lifted coaches were interested in introducing gamification into their courses. On the other hand, gamification did not emerge as a need from seven out of eight user interviews of this study, and it was even a negative aspect in one of the interviews. Additionally, Lifted coaches were worried about introducing any competitive elements into their courses to avoid putting any of their users into disadvantaged position. Therefore, the results of this study cannot support the findings of Vaibhav & Gupta [36] until gamification is further researched.

**Design guidelines**
The identified features can be thought of as tentative design guidelines for an online health coaching platform. They are based on interviews from the coaches and users, who enjoyed and benefitted from the courses. To my knowledge, these tentative guidelines for online health coaching platforms are unique in the field of HCI research.

Based on the findings of this study the basic structure of an online health coaching should continuously give users limited choice i.e. categorizes to choose from to make their experience feel more personal. It should provide them with a timetable about what is to come, and then keep them accountable by making them track their progress compared to others.

The online community and the coach communication were big part of the overall experience for Lifted users. Based on
their responses an online health coaching should offer both
discussion group and lesson based discussions, as well as
a way for coaches to communicate back to users as
efficiently as possible. Features like a user profile and
message overview could make the job of the coaches easier.

To keep users on track there should be reminders and time
limits on the material to create positive pressure. On the
other hand, users that fall behind should be taken care of by
contacting them and providing support they need.

Three features that did not exist yet in Lifted’s courses, but
hold potential for even greater impact on users’ health
behavior change should be studied further to determine how
they would actually affect it. Those features were user
chosen pace, progress visualization and achievements, as
well as personalization based on health data.

Reflection on methodology
This study develops understanding for behavior change in
the context of online health coaching. Hekler et al. [17]
suggested that such contextual specificity is often lacking
from studies of persuasive technologies. The method used,
understanding use, was what Klasnja et al. [18] proposed as
an alternative for studying behavior change.

Since Klasnja et al. [18] did not describe the understanding
use strategy in greater detail; there was no given
methodology to follow. The choice of conducting semi-
structured interviews with both Lifted coaches and users
was taken in order to explore one possible method to
develop the understanding of user perceptions and use
patterns. To my knowledge, the understanding use strategy
proposed by Klasnja et al. [18] has not previously been
used in practice in HCI research, so more studies examining
a persuasive system using it should be conducted to further
develop the practice.

Because the interviewed users were Lifted customers that
really had enjoyed their experience, the emerged features
and themes are ones that work for this group. Interviewing
users who have not achieved any change and who did not
enjoy the coaching could yield different kind of results.
Such interviews could offer contrary views on the features
identified in this study and insight into what other features
the unsatisfied people would need to complete their
courses.

Gender could not be identified to be affecting the results of
this study, but only two males were interviewed. The whole
user interview sample is not statistically significant, even
though it was extensive enough to discover patterns in
platform usage and user perceptions.

Future work
All potential features from individual pacing of material to
progress visualization and achievements would need to be
evaluated once implemented in the system. They are
features that emerged from the shortcomings of the current
system, from the hopes of the coaches or users or their ideas
about where the system should go in the future.

Quantifying some of the results of this study would further
explain how significant impact these features have. For
example, it would be interesting to know how big part of
the user population benefits from gamification or the
community and see if these users share some characteristics.

This study has tried to shed light on why Lifted’s online
courses work and what features support the users. Another
way to approach the subject would be to study what aspects
of the courses do not work i.e. which features do not affect
or even hinder users’ behavior change. This could develop
our understanding about what not to design and give insight
in further personalization practices.

Since this study was a case study, other online health
coaching platforms should be studied in order to verify the
results and determine their generality. Other courses might
exhibit features that do not exist in Lifted courses and have
not been thought of by Lifted coaches or users.

CONCLUSION
Based on the interviews of this study, several features in
five categories influenced user retention and engagement on
Lifted’s online health courses. The identified categories
were general system attributes, personalization, community,
gamification and commitment. The attributes, including
reliability of the system and ease of use, together with the
discussed features like content categorization or discussion
groups, can be used as tentative design guidelines for
current or future online health coaching platforms.

This study approached health behavior change by
examining how the participants used the system, their use
patterns and perceptions of the online health coaching of
Lifted, which was a strategy suggested by Klasnja et al.
[18]. This approach can lead to a more versatile
understanding of persuasive technologies and how they are
integrated into people’s lives. This study shows the
potential of using such a strategy in HCI research.

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REFERENCES
1. Baghaei, N., Freyne, J., Kimani, S., Smith, G.,
Berkovskyy, S., Bhandari, D., Colineau, N. and
Paris, C. 2009. SOFA: an online social network for
engaging and motivating families to adopt a
healthy lifestyle. In Proceedings of the 21st
Annual Conference of the Australian Computer-
Human Interaction Special Interest Group:
Design: Open 24/7 (OZCHI ’09). ACM, New
York, NY, USA, 269-272.


