Changing my life one step at a time – using the Twelve Step program as design inspiration for long term lifestyle change

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ABSTRACT
To explore how people manage and maintain life style change, we conducted interviews with eight members of different Twelve Step Fellowships with 2-23 years of recovery about how they maintain and develop their recovery in everyday life. They reported how identification, sharing, and routines are keys to recovery. Our lessons for design concerns how these concepts support recovery in a long term perspective: Sharing to contribute in a broader sense to the fellowship and to serve as an example for fellow members created motivation even after 20 years of recovery; reflecting over routines in recovery was essential since life is constantly changing and routines need to fit into everyday life; concrete gestures were helpful for some of the abstract parts of the recovery work, such as letting go of troubling issues. Design aimed to support maintenance of lifestyle change needs to open up for ways of sharing that allow users to contribute their experiences in ways that create motivation, and support users in reflecting over their routines rather than prompting them on what to do.

Keywords
Twelve Step program, recovery, life style change, long term, maintenance of life style change.

ACM Classification Keywords
H5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

General Terms
Design

INTRODUCTION
The ubiquity of mobile technology in our lives gives it an important potential to provide support for life style changes. In the western world, cell phone penetration is close to 100%, and many users carry their phones at all times. This makes them uniquely suitable for collecting data, providing timely information, and reminding us in everyday life, something that has been used to support a number of issues such as physical activity [5, 8], diabetes management [15], and stress management [21]

The western world faces a number of life style challenges such as declining levels of physical activity in combination with increasing work hours resulting in increasing numbers of people suffering from obesity, diabetes, and cardio vascular diseases and other stress related health problems. These problems require significant changes in life style (eating, working, exercising), and continuous reflection and monitoring for positive results to last. Even though professional help from doctors and other professionals is valuable to achieve such changes, a significant amount of self monitoring and reflection is needed to create sustainable change.

We believe that the CHI community has an important role to fill in these situations where technology need to blend in deeply in everyday life to support long term processes of creating and maintaining new habits and new behavior. Most studies on technology that supports behavior change focus on motivation and the initial phase of for example start to exercise, e.g. [5, 10]. Less attention is given to how people manage to maintain a new habit. To gather knowledge on how we can design support for long term changes in life style, we conducted a series of interviews with people who have managed to make significant changes in their life and maintain that change for a number of years.

We interviewed eight people who had used the Twelve Steps to recover from addiction or from the effects of living with an addict and had maintained a stable recovery for 2-23 years. By studying how they manage and maintain life change, we can learn how to support such a process through design, and how we can transfer that knowledge to other

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domains of life. While addiction differs from obesity and cardio vascular disease in many aspects, it is similar in that life changes are required to recover, and those changes need to be maintained over time, possibly a life time.

We have chosen the Twelve Step program since it offers us insight in a community of peers where there are no professional coaches, therapists, or doctors to teach recovery or to take responsibility over someone else's recovery. This structure provides information about how to support self monitoring and self management of life change. New behavior and new habits must be created in everyday life, and this study sheds light on how that can be done. We do not claim that the Twelve Step program is the only way to achieve lasting lifestyle change, or that it is better than other available methods. However, its structure and success in many different areas offer an interesting example worth studying closer.

BACKGROUND THE TWELVE STEP PROGRAM

The Twelve Steps were written within Alcoholics Anonymous in the late 1930s as a way for alcoholics to recover from alcoholism [2]. The Steps are a personal guide to recovery that is preferably worked with a sponsor, a mentor that has worked them before and can share his/her experience. The Twelve Steps has since been adapted to many other addictions such as narcotics, gambling, over eating, sex and work, as well as the effects of living with people with addiction. Friends, relatives and other people living close to an addicted person have been shown to develop similar behavior as the addict without actually taking the same drug and the same need for recovery [6].

The personal Twelve Step work aims to change behavior and ways of thinking in order to get away from the addiction. The work is done through attending meetings to hear others experience, personal conversations and meetings with a mentor, reading of Twelve Step literature, and attempting to apply this in everyday life. The broad order of the work is to acknowledge the problem, find a spiritual connection, sort out one's past to be able to leave it behind, mend social relations as far as possible, and then share the experience of recovery with others[1].

The Twelve Step fellowships are peer-to-peer fellowships organized on voluntary basis. No one has authority over anyone else or is responsible for anyone else's recovery. Members who have recovered share their experiences with those who want to recover themselves [3]. The main arena is the meeting where members gather regularly. Meetings can be attended without signing up beforehand, no attendance lists are kept, and members take turns to chair [1, 3]. Members can attend as often as they want or need depending on how many meetings that is available.

[1] http://en.wikipedia.org/wiki/Alcoholics_Anonymous

The oldest and best known Twelve Step fellowship is Alcoholics Anonymous, AA, that is active in more than 180 countries. AA's own information about the Twelve Step program can be found on their web site, www.aa.org, or in their basic book Alcoholics Anonymous [2] that is available in many libraries and can be ordered from their web page. The oldest Twelve Step community for families and friends of addicts is Al-Anon for friends and relatives of alcoholics which was founded in 1951 and is active in more than 130 countries (www.al-anon.alateen.org).

Even though the Steps have been adapted to other issues than alcohol, the general view is that it is the same program used for different problems. Hence, we will here use the term *program* to refer to the Steps, while the term *fellowship* will refer to the different organizations. Alcoholics Anonymous (AA), Overeaters Anonymous (OA), and Al-Anon Family Groups (Al-Anon) are different fellowships using the same program.

Important building stones for both individuals and fellowships are: sharing of experience, identification, and participation [2]. By sharing experience members can recognize themselves in others and feel that they belong in the fellowship. When members share their experience, newcomers can relate to and see their own problem as well as realizing that the program can work for them. They can identify with others and thereby come to believe that they can recover in the same way as others. By doing service work, i.e. participating in all kinds of practical matters that is needed to make the organization function locally, nationally, and internationally members create a strong feeling of being a part of and belonging to the organization.

The Twelve Step program is a spiritual program that is not allied with any sect or denomination, but allows members full freedom of choice in what they believe in and how they practice their beliefs [3]. The work presented here focus on the daily practical action participants take to maintain recovery and not on participants' spiritual practices.

RELATED WORK

Theory

The transtheoretic model of behavior change [19] is used to describe the process of dealing with addiction. It identifies five stages that a person goes through for example when trying to quit smoking. *Precontemplation* is the first stage which occurs before the person realized drinking is a problem. People in precontemplation do not want or plan to take any action in the foreseeable future. *Contemplation* occurs when a person would like to quit drinking in a near future. *Preparation* occurs when a person takes certain steps toward quitting such as cutting down or gathering information about treatment options. *Action* occurs when a person actually quits. The last stage is *maintenance* which occurs when a person has quit drinking and tries to stay sober. Prochaska et al. concluded that the stages occur in

many domains of addiction, and that different treatment interventions are needed in the various stages. For example, people in the contemplation stage are more likely to benefit from information campaigns compared to people in precontemplation, while the contemplators might not be able to accept and benefit from instrumental advice on quitting such as how to deal with withdrawal symptoms.

Goal setting theory [11] claims that explicitly setting goals help people achieve their goals. If they have chosen their own goal, the goal is important to them, and challenging yet within reach people improve their performance using goal setting. The original theory was formed within workplaces and concerned employees improving their work performance. Since then, it has been used in various areas such as exercise [7] and energy saving [4].

Feedback of progress has been used in combination with goal setting in many studies on for example energy saving e.g. [9] which have shown that the combination is much more effective than only goal-setting.

In the Twelve Step program, the basic assumption is that to be able to accept help and benefit from it you must accept and acknowledge the problem [2]. In terms from the transtheoretical model of change, which in no way is used in the program, this would put members of the Twelve Step fellowships in the action or maintenance phase. The only motivational mechanism used in the program is examples, members who share about their recovery and the positive changes in their lives that has come out of recovery motivates others to continue the recovery work. Goal-setting, or rewards are not used.

Studies on life change management and existing applications

The Internet has been used as a source of information and social support around health issues for a long time as has been shown by for example Preece [18], and Mamykina et al. [15] just to mention a few.

The possibilities for social support online has only increased over the years with the appearance of large social networks such as MySpace and Facebook, and also the availability of technology that makes it easy to set up small communities for various purposes. The rapid growth of mobile devices adds more availability and access to this source of social support.

These advances have inspired the CHI community to explore the potential of social technology to support lifestyle change, addressing important health issues such as exercise [23] and diabetes [14]. Many of these studies have focused on motivation and how to help people take the first step towards a change such as to start exercise or change their diet.

Many available smart phone applications target lifestyle change, and some examples will be described below.

Mobile apps for life style change

Exercise is the most common domain for mobile services that targets lifestyle change with examples both from research and the commercial arena. The Ubifit project worked on automatic recognition of activity to relieve users from data input, and combined it with visual feedback to create motivation [8], whereas Ahtinen et al. restricted their application to the activity of walking but offered goal setting and the ability to represent the goal as a journey to support motivation [5]. There are also a number of commercial products in the exercise domain. Some combine hardware for data collection such as the Polar pulse meter or Bodymedia FIT armband, with software to collect and visualize collected data, while some are pure software that relies on built in sensors in the phone such as Noom weight loss or Runkeeper. Many of these apps allow sharing of activities and results for example by posting on Facebook.

What these services have in common is that they focus on simplifying data collection. In addition, the type of data they are able to collect is rather simple as long as the right sensor is available, such as GPS for distance or a pulse meter for pulse.

Projects closer to our goal is the Affective Health application [21], and its predecessor Affective Diary [22], that is using sensors to collect body metric data and visualizes it to help users reflect upon health issues such as stress and well being. We believe that the stance of allowing and supporting users to reflect on their behavior is very important. Ståhl et al. have put extensive work into creating a visualization of collected data that allows users to make a personal interpretation of their data. Thus, Affective Health is an inspiring example of an application that provides users with a rich material for reflection.

Even though some lifestyle change apps are conceptually simple and sometimes only provide digital access to already existing material, they make it considerably easier for users to think about changing their lifestyle. Cell phones or smart phones are important personal possessions that we carry at all times and lifestyle apps tap into our habits of playing with the phone during moments of free time [17]. We believe that the technical capabilities in combination with cell phone habits could provide powerful support in daily work for changing our lifestyle, in combination with other activities. A single app in isolation will never be able to change a person's lifestyle.

Long term life style change

While many attempts to motivate people for lifestyle change has been made, less attention is given to the everyday work to maintain such a change over time, and how we can support that through design. Most studies on systems for life style change have lasted for a few weeks [8, 22] or even shorter [5]. Such short studies can tell us a lot

on motivation and how to get people to take the first action toward behavior change. However they tell us little on how to maintain that change over time. For lifestyle change to have an impact on our health it must be maintained over time, sometimes over a lifetime.

Some attempts have been made to investigate the domain of maintaining a lifestyle change in a long term perspective. Examples are Mamykina et al. [15] who studied how people manage their diabetes and Maitland & Chalmers [13] who studied participants in a ten week cardiac rehabilitation program. We aim to contribute to this body of research on long term life style change by studying recovering members of different Twelve Step fellowships. We believe that the peer network structure of the Twelve Step fellowships with no professionals involved, and the experience of members who have maintained a lifestyle change for many years will offer valuable insight in how to support lifestyle change in the long run.

We certainly acknowledge the difficulties with conducting longitudinal studies, and hope that our work in combination with the previous work presented above can inspire to more research on long term life style change.

METHOD

Our aim in this study is to understand how members of the Twelve Step fellowships maintain and develop their recovery even when it has been stable for many years. We chose to interview them in order to get their own perspective on the recovery work even though interviews have weaknesses when it comes to collect data on behavior. However, we believe that our material provides a useful starting point for our understanding of long term maintenance of life style change.

Interviews

Eight semi-structured deep interviews were conducted, lasting from 45 minutes to two hours. All interviews were recorded, transcribed, and analyzed with open coding. The focus of the interviews was on personal work with the program, not what participants did together with sponsors or how they participated in meetings.

The interviews focused on participants present situation, how they dealt with recovery in everyday life, and how they related to their fellowships. Participants were encouraged to give examples from their recovery work, and to share ideas on how they would like to improve it.

Participants chose a convenient location for the interviews. Three interviews were conducted in the home of the participant, one in a participant's workplace, and three were conducted in cafés picked by the participants. One participant was confined to bed due to recent surgery and asked to be interviewed from home over the phone.

Participants

Participants were recruited considering their time of recovery and fellowship. Since we were interested in how participants maintain their recovery we recruited participants who were active in their respective fellowships and had a stable recovery. However, care was taken to find people with different length of recovery, as well as both addicts and families and friends of addicts. Participants were aged between 23 and 64, and had 2-23 years of experience in the program.

The participants represented four different fellowships, Alcoholics Anonymous (AA), Al-Anon Family Groups for friends and family of alcoholics (Al-Anon), Overeaters Anonymous (OA), and Sex and Love Addicts Anonymous (SLAA). Two participants were members of more than one fellowship. We recruited participants from several fellowships to be able to abstract their recovery work over different kinds of addictions. Including friends and relatives of addicts that are using the program to recover broadens the data and makes it easier to transfer the results to domains outside addiction.

Id	Gender	Age	Time in program	Fellowship/s	Worked the Steps
P1	F	46	20 years	Al-Anon, OA	Yes
P2	M	64	23 years	AA, OA, SLAA	Yes
P3	M	23	2 years	AA	Yes
P4	F	26	5 years	AA	Yes
P5	F	63	14 years	Al-Anon	At Step six
P6	F	32	7 years	Al-Anon	
P7	M	43	5 years	Al-Anon	Yes
P8	F	34	6 years	Al-Anon	At Step seven

Table 1: Basic data about the participants

We chose to interview only people with stable recovery and no relapses into addiction, to be able to focus on maintenance of life style change. For future studies it might be beneficial to also interview people with experience from relapsing and returning to recovery. Table 1 shows basic data about the participants.

Our participants were attending meetings regularly, and as most members with stable recovery they were involved in some practical work to keep the meetings going. However, this does not mean that they had any particular experience or education compared to other members. The participants in the present study would according to the transtheoretic model of change be in the maintenance phase.

RESULTS INTERVIEWS

Identify, share and pass it on

The driving force in the Twelve Step fellowships is the sharing of experience. Members share their stories about how their life was before they came to the program, what

made them decide to come to a Twelve Step fellowship, and how their lives are today. Newcomers can identify with stories about other members' lives before the program, and get first hand evidence on how the program can help them. If their present life is similar to such a story, they can come to trust that if they do what the speaker did, they will get the same life change. The sharing of personal stories takes place in meetings, in personal one-to-one meetings, over the phone between friends, in sponsor-sponsee contacts, and personal stories are frequently featured in the literature.

The thing that has helped me the most, is definitely the identification ... that's always what hits me, you know, when people start talking, and talk about my feelings and my experiences as theirs ... I'm not alone. (P6)

This goes well in line with the results of Maitland & Chalmers [12] who found that their participants did not share their struggle with weight management with anyone, and in some cases not even with everyone in their weight club. Lifestyle change can be a sensitive issue, both admitting that there is a need for a change, and that this change is difficult to achieve. In the Twelve Step fellowships members share the same problem and the identification helps them open up and share about their need for recovery as well as their progress and setbacks.

Meetings are an important tool for keeping up the recovery work and offer an easy way to take action in the recovery. Attending meetings helps breaking isolation, the listening to other's sharing in person makes it easier to understand and take in compared to reading the literature, it is an easy way to get access to the program, and provides a social context. All our participants found it important for them to attend meetings regularly. Our participants reported attending meetings 1-4 times a week and they usually increased their meeting attendance if they did not feel well or were going through rough times. Phone, email, and text messaging as well as face-to-face meetings were used to stay in touch with other members between meetings.

P2, P6 and P8 used digital recordings in their recovery work. In many cases, people that share how they work the program are recorded and the recordings are distributed in meetings and on the web. Our three participants reported that they downloaded such recordings to their cell phones or portable mp3 players and listened to them on the way to work, or on walks. P8 found it easier to connect to a personal story when it was spoken compared to reading it in a book, and P6 said it was one of her few moments of contemplation during the day.

All our participants did basic service work in the meetings they attended, such as helping to set up the meeting, making coffee etc. They reported that service was a good way of creating a sense of belonging. Helping out made them feel as they were a part of the fellowship. They also felt it was important to give something back to the fellowship and contribute to it for the future.

When I started doing service, I got in to, I became a part of the fellowship in a way I don't think I would have become without it. (P4)

Sharing personal stories is not only important for introducing new members in the program, and to inspire existing members to continue their work, it is also an important action for the person who does the sharing since it offers a means to reflect on their current status, highlighted the past in a way that made their progress clear, and reminded them of their journey through recovery.

Well, for me it is very good to tell my story, to see how far I have come. When I get some perspective, you know. (P6)

In a way I tell myself too, at the same time as I tell someone else. (P8)

A very overt way of sharing recovery is to be a sponsor. A sponsor guides a sponsee with less experience in the program in the recovery work. A sponsor-sponsee relation can go on for many years and offer many opportunities to share progress and setbacks in the program. Seven of our participants had a sponsor (P1 did not have one, P6 had two). Five participants were sponsors themselves, and two had been sponsors and would accept a sponsee if asked. P2 had a fixed time of the week when he always called his sponsor; the others contacted their sponsor when they needed to talk about something.

Sponsoring is to make the journey with a newcomer, and thereby revisiting your past and reliving your own journey. (P4)

As seen in the examples, the participants did not stress the importance of having a sponsor for their recovery, but the importance of being one. When in stable recovery, the sharing of experience through sponsorship seems to be an important factor for both motivation and progress. The personal meeting, the contacts with others, and the engagement are invaluable.

Establishing routines

Routines are crucial tools in recovery, both for supporting desired behavior and thinking, and avoid undesired behavior and thinking. Routines connected to recovery work can be daily, others weekly or less frequent. They do not have to be advanced; simple things such as read from a daily reader every morning and try to focus on that topic during the day, or going regularly to meetings can be very helpful. Our participants reported going to meetings between one and four times a week, and four of them were using daily readers.

Well, I try to read every morning, today's text so to say. Now, I have both of them [books] so I try to read one in the morning and the other in the evening. (P7)

Other routines were more complex such as sponsoring other members in the fellowship, following a meditation regime

such as qi gong or ACEM, or participating in regional service work. The routines helped them to stay on track in their recovery and to feel sure that they were prepared to meet the immediate future.

If I would skip my morning meditation, now that has not happened in years, but if I would, I know by experience that I'll have a fairly bad day. (P4)

Routines are a way of creating stability and safety in everyday life, and deviation from established routines sometimes caused anxiety and worry for our participants. For example, P3 reported that if he deviated from his routines to contact other members, such as his sponsor, he lost confidence in their relations and started to question himself.

Then the thoughts start to come, 'he is probably busy, he hasn't time for me, he doesn't want to talk to me'. But if I call regularly, just to say 'Hi', then those thoughts go away. (P3)

Good intentions meet everyday life

Establishing routines can be difficult, even though they are desired, and connected to important goals or activities. Some parts of the day are busier than others which can make it difficult to find time for recovery work, for example mornings are often busy with preparations for work or school. Many of our participants struggled with their morning routines trying to get children to school, getting ready for work, or just getting out of bed early enough to fit some recovery work into the morning.

I used to get up early and meditate for twenty minutes every morning, but then I thought I could sleep a bit longer instead. So it is not easy [laughs] (P3)

Family duties can also make it complicated to establish routines for recovery work. Recovery is important but parent responsibility takes precedence. Several of our participants had children who needed attention, and help to get ready for school or after school activities. For example, P6 reported having to come up with completely new routines for recovery work after the birth of her daughter, sometimes stricter than before she became a mom since the room for compromises or improvisation became slim. Even though her daughter had top priority, she sometimes found it hard to be forced to set recovery aside.

I would love to have those five minutes in the morning, I get so envious when I hear people say they light a candle to start the day, take a quiet moment and read today's text. I start the day with a diaper change. (P6)

In some cases participants created supportive routines around their recovery routines to help them stick to them, such as connecting them to another activity they liked.

I bought a massage chair that runs a 15 minutes program ... that becomes a form of meditation ... and then I make myself do it. That's kind of why I bought it. (P2)

Deviations from everyday life can make it difficult to keep up the recovery work. Participants gave examples of both happy occasions and sad events where they had lost track of normal routines. P5 talked about how easy it was to forget about the program when she traveled, and therefore appreciated very much when she could find a meeting at her destination. P1 reported different reactions to two family crises, one where her qi gong routines fell apart and one where she could keep them together.

It got very chaotic when my son tried drugs, so I quit everything. Let go of the qi gong, just like that. And I didn't even notice. ... But then, then when my father was dying I stuck to it, I did qi gong in the hospital. ... Sometimes it is easier in crisis than in everyday life. (P1)

As P1 describes it, crisis can be a motivating factor for recovery. In hard situations familiar routines can provide comfort and safety. However, several participants reported that to be able to lean on their routines in times of crisis they needed to establish the routines during normal periods.

If it's not working in normal everyday life, it's not going to work in a crisis. (P7)

Plan B – when the routines fail

As described above, routines were important for our participants but also difficult to establish and maintain. Everyday life does not always lend itself to good intentions and reasonable plans. Even though the purpose of a routine is to do something specific regularly and with as few exceptions as possible, it can be very useful to have a plan B when plan A fails. Many of our participants reported that they just tried to get back to their regular routine if they got sidetracked for one reason or another. But some of them had backup plans for certain situations, for example P8 had a short version of her morning meditation that she could do on the train if she overslept.

If I don't have time before I leave home I do it on the train [the quiet moment]. And then it's handy because I have email in my phone so I can read those emails [from a recovery mailing list] there. (P2)

P6 had started to rethink her view of having a quiet moment to start the day like she heard other people talking about. Since she had realized that such a routine was incompatible with her current family situation she thought about trying to fit that moment into another part of the day.

I'm thinking it would be more practical to turn it around, and, maybe, have that moment in the evening. Just lock myself up for five minutes and finish the day instead. ... Think about tomorrow in the evening instead. (P6)

She had not tried to put that in place yet, but the insight that there might be a better way was an important step. Routines need to be reasonable to work, and everyone needs to find their own working solution. Reflection over why routines do not work, and how they could be improved is needed on a regular basis.

Getting out of negative thinking or behavior

All of our participants struggled with negative thinking at times, and tried to establish routines for situations when they found themselves thinking or acting in unwanted ways. This included preventive actions such as regular meeting attendance and regular meditation as described above, and regular contact with sponsors or friends in the program to assure it would not feel awkward to contact them in times of need.

With the help of the books [daily readers], you can get some, direction in your thoughts. Replace some thoughts with other thoughts. [you] get help with that. (P1)

The general engagement in the fellowship also proved to give useful help in breaking out of negative thinking. Several of our participants were sponsors or otherwise involved in service work. These activities made other people contact them, and also required attending meetings in addition to the regular meetings they went to. Often such calls or meetings seemed to occur with excellent timing and helped them focus on healthier things.

Sometimes when I get home after a long and rough day ... and feel VERY sorry for myself [laughs]. Then a sponsee calls and want to talk about a trip, a relation or anything. Eh, we talk a bit, hang up, and that, that MAKES my day! (P4)

The experience of timing in such situations will sometimes be a lucky coincidence. However, the effort that our participants put in their recovery work creates the ground for such things to happen. By engaging in the fellowship and taking action to recover they open up to new possibilities and become receptive for such coincidences. In a way, they create the timing themselves.

Our participants also reported that any kind of action, no matter how simple, often helped them get out of their distorted thinking. It did not have to be a program related action, just something that they could focus their thinking on for a while.

Well, it could be reading a novel, or something. Read a news paper, solve a cross word puzzle, listen to the radio, eh, actually call someone and say hi, get out of the house. Anything. (P1)

Letting go

One way to avoid getting caught up in negative thinking is to let go of issues that are beyond our power. Big or small, things we do not like or would like to be different can drive us crazy. However, if we have no influence over them getting crazy will not change anything.

Letting go was an important tool for our participants. When thoughts started to race or obsessive thinking was approaching, they tried to stop themselves and let go of an issue that could make them sidetrack from their recovery. The act of letting go could involve turning issues over to God, sharing them with friends or creating acts of sending them away. P4 reported that she tried to let go of issues by turning them over to God. That always worked for her, even though it sometimes only worked for a short time.

Sometimes it helps for good, like that issue goes away forever ... sometimes it helps for five minutes, and then five minutes later I'm back and have to do it again. But it always helps. (P4)

Several of our participants had some form of gesture for letting go to mark the action, to help themselves change track of mind. A tangible action made it clearer that they were letting go, and thus easier to accept and act accordingly. The action could be as simple as saying "I let go of this" out loud.

If I'm by myself I say it out loud, it feels more powerful. Otherwise I do it silently. This morning at the pool I did it silently so that people wouldn't think I'm a moron. (P6)

P2 had developed a strategy for letting go through text messages from his cell phone. He had made a deal with friends that he did it for letting go and not to engage in conversation.

Something comes up and you need to send it away. like this is how I feel right now ... then it disappears, something happens in that process, definitely. It's great. (P2)

To him, this was a tangible gesture for a rather abstract action. Making the recovery work visible could support the process and make it easier to create a routine around certain parts of it.

DISCUSSION

Real detail makes it possible

Being able to identify with other members in the program is important for both newcomers and experienced members. Newcomers get assured that they can recover when they hear more experienced members tell their story. Older members get perspective on their own recovery by listening to newcomers. Hearing the struggle and sufferings of someone that just decided to start their recovery provides a powerful reminder to the oldtimers about how their lives used to be, why they decided to make changes, and how their lives have improved during their recovery.

An important aspect of the identification in the Twelve Step recovery is that it builds on detailed personal stories, told in an undirected way by non-professionals in group meetings, face-to-face situations and the like. Even when stories are published in the Twelve Step literature, the details and the personal perspective is kept. The stories must be 100% believable to be helpful. Listeners need to understand in a very tangible way how a speaker has managed to change their lives. If the discrepancy between "before and after" is great, not enough detail on how a person managed to make the change might even discourage others and stop them from trying. The element of personal recognition through the authenticity of the shared stories is essential. Maitland & Chalmers [12] introduced five types of peer-involvement: obstructive (don't do it), inductive (you should do it),

proactive (do it with me), supportive (I'll do it too) and co-operative (let's do it together). The peer involvement in the Twelve Step fellowships is experience-based – this is what I did and what happened.

Another important aspect is that members meet over a long period of time and get the opportunity to see people progress in their recovery over the years and can come to trust the results of the program.

Passing it on is an important tool

It was important for our participants to continue to share their experience with other members, even though their recovery was well on track. This was done through sharing in meetings, being sponsors, and staying in contact with other members between meetings. Our impression is that it had nothing to do with showing off or bragging about their success. Rather they felt that it was a good way for them to assess their own recovery and created a sense of belonging to the community. As pointed out by Prochaska et al. [19] it is in the action phase that people tend to get positive feedback from their friends and loved ones since the action is visible. In the maintenance phase, surrounding people often believe that the problem is solved even though there might still be a great deal of struggle left for someone who is trying to change their life. Going for example from drinking to not drinking often generates a lot of positive feedback. Continue not to drink might be equally difficult as quitting in the first place but sometimes pass unnoticed after the first weeks. The opportunity to feed the experience back to the community as well as mirror your recovery in others could create the support and feedback needed to continue to maintain the recovery work. Reviewing your own recovery through the sharing of experience provide a personal way of measuring the progress of recovery that is based on your experience rather than comparison with others.

Many participants reported that they enjoyed paying back what they had received to the community. They wanted the fellowship to be available to others who needed it, but also to themselves whenever they would need it in the future. Contributing to the future of the fellowship seemed to create motivation on a different level than the reward of personal recovery. We believe this is an important part of maintaining recovery in a long term perspective.

Combining recovery routines and everyday life

Routines are important to maintain recovery. To make changes in life, it is necessary to start acting differently and new routines support this in several ways. Old habits must go and new habits need to be built up. A lot of different actions need to be taken to succeed with major life change. One action can be to avoid old places, old people, and old situations and thus try to avoid triggering bad habits. Another action can be to create new habits and new ways of acting to replace the old ones. This usually takes time and exercise, but with effort and patience it is possible. Our participants tried hard to create new habits and new routines. With a routine of for example going to meetings Monday, Thursday, and Sunday, or calling a sponsor every Monday at 7pm, there is no room for hesitation, or bargaining about recovery. The goal is to stick to the routine regardless of mood and motivation knowing that it will boost the recovery in the long run. Our participants tried to create routines that put them in a state of mind that made it easy to do the things that boosted their recovery, as well as routines that would help them get back on track in case it would feel difficult or insurmountable to stick to recovery. Since routines for recovery must fit with ordinary everyday life we believe that it is important to aim for reasonable routines that are grounded in personal everyday experiences. Meditating twelve hours a day might be beneficial for recovery but is not compatible with a full time job. It requires regular reflection on both the organization of everyday life and the routines for recovery to make this work.

DESIGN IMPLICATIONS

Twelve Step recovery is not dealing with issues of life style change that is unique for the domain of addiction. Needs and difficulties around lifestyle change are similar whether the change concerns drugs, exercise, eating, or other habits.

Sharing is important to maintain recovery

Sharing of experience is very important for recovery within the Twelve Step program, as is illustrated in our material. Therefore, we believe that attempts to design for supporting any change in life that users have chosen to take would benefit from social elements. As we have seen above, sharing provides motivation to both the person who shares and the listeners, proof of the result, and a long term motivation to continue to recover. Listening to others, as well as sharing one's own experience are important elements for lifestyle change.

Through technology, sharing can occur directly and indirectly. Direct sharing takes place when users actively share material for example by posting pictures or text to a forum or commenting on other's posts. Indirect sharing takes place when users actions, mood, or state is conveyed to others automatically for example through monitoring a device's position or sensing user action (such as setting status to "away" when the computer has been idle for ten minutes). Active sharing is more personal and could be more detailed depending on what users choose to share. It is also clearer for users what information is shared or not since sharing requires an action from the user. However, indirect sharing contributes both to identification and inspiration. It can inspire to exercise when friends check in at the gym, or it can be a relief to see that others are too stressed out to go there even though the information is not very personal. Sometimes just the awareness that others are

using an application could provide support, which we will discuss this further below.

We believe that both direct and indirect sharing has a role to play in applications that support maintenance of life change. Direct sharing gives the opportunity to actively inspire others and pay something back to a community that has helped you. It also provides a concrete action that makes recovery work tangible and visible. Indirect sharing, on the other hand, provides a very simple way of contributing and inspiring.

However, users need to be allowed to choose what to share and not, as well as with whom. As Maitland & Chalmers [12] showed, people struggling with weight management did not share their efforts with just any friend. To support sharing it is important to target a specific group to allow for identification and trust. Newman et al. [16] identified impression management as an important issue in online health communities. Many people were hesitant to share struggles or setbacks with the community, while progress was easier to share. In the Twelve Step fellowships the identification with other members, and the honest sharing of experience help mitigate such hesitation. Encouraging users to share the history of their lifestyle change or the attempts to change their lifestyles might support the type of identification that is central in the Twelve Step fellowships.

As for what to share, we suggest a distinction between *thoughts* and *experience*, where *thoughts* allow for personal notes or ideas that might be kept private and *experiences* would be more mature and suitable for sharing. The distinction is flexible, thoughts could be shared as well as experiences could be kept private. Thoughts could turn into experiences over time. This way, users can choose what to share and what to keep personal and both thoughts and experiences can be made available for reflection. Below, we will discuss the importance of reflection when designing for maintenance of life changes.

Reflection is necessary in the long term perspective

Personal reflection is crucial to recovery. When trying to make changes in life, it is important to reflect over the current situation and the past to be able to take action for the future, especially when long term change is needed. Life is subject to change, and routines and actions that are beneficial at one point in time might not work a year later.

In most cases, it is helpful to have some support for the reflection. It can be a traditional diary to support memory, friends' perception of one's behavior, or a medical journal with personal health information. Mamykina et al. showed that digital notes were helpful [14]. The support that is used for reflection does not have to be entirely personal though. Other people's life stories and experiences also provide valuable input as external reference points of what could have been or what is possible. They can serve both as encouragement and as negative examples, or provide goals.

We believe that design for maintaining behavior change need to support users in reflecting on how their routines work, how their lives are organized, how these two fit together, and if a change in one area or the other would create an improvement.

Visualization is an important element when supporting users to reflect over their own behavior and that of others. If information is available from a large group of users, or from a long period of time, it is difficult to grasp the amount of data. By giving users this data in an accessible form, they are given tools to reflect over their own behavior and maybe find patterns over time and learn what is and what is not successful in their way of coping, without anyone telling them what right or wrong.

Context information could be a valuable tool for reflection as well. Many high end cell phones are equipped with sensors such as GPS, accelerometers, or thermometers which can provide basic information about situations in which a service or device has been used. Such context information can act as a memory support and make it easier for users to reflect upon collected data at a later time. Many times there is little need for computational processing or interpretation of data, since users easily can interpret their own contextual data. Users can usually infer that they were at home when an imperfect positioning technology places them across the street from their house, for example. Obviously, it will be possible to draw on previous work done on life logging here, for example [20].

When designing services for supporting maintenance of life style change, it could be valuable to include functionality for visualizing how they are used. If users can review their own use rhythm and use context it can help them understand when they feel a need for support and why.

Creating concrete gestures to support routines

Lifestyle change is not only about how we act in the world. It is also about how we think and feel. As described above, the purpose of some of the routines our participants created was to avoid negative thinking or obsessing over things they could not influence. In a few cases, participants had created concrete gestures for abstract actions to make them more powerful and easier to maintain.

The example gestures from our participants supported the letting go of issues that troubled them by saying the issues out loud or sending them away in a text message, and meditation by the use of a massage chair. Having a concrete gesture made it easier for them to do what they needed to do, created an observable action of a rather abstract phenomenon, and also created clear boundaries for the action. Often it is easier to *do* something to change the thinking compared to just *think* about thinking differently. It also made it easier to remember to do the action. Sitting in a massage chair for 15 minutes is not the same thing as meditating, but on a stressful day or in times of worry the

action of sitting down in the massage chair might calm a person's mind enough to be able to meditate since sitting in the chair is associated to meditation. Even if that does not happen, sitting in the chair and getting a massage for 15 minutes is a more relaxing activity than failing to meditate.

Technology can introduce new possibilities for creating these gestures that make them more personal and perceived as more powerful by users. Text and other media such as pictures, sounds, and video can be used to describe troubling issues and graphics and sensors can be used to create gestures. Troubling issues can be metaphorically set on fire, or watched flying away, and throwing or punching gestures to make them go away can provide a sense of release.

CONCLUSION

We found that our participants had several different tools for sticking to their change and keep their motivation up. A strong factor for their motivation came from their engagement in their fellowship. By contributing with experience and taking care of simple practical matters to keep the meetings going, they created a sense of belonging that kept them motivated even after 23 years of recovery. Another important tool for maintaining life style change was routines. Establishing routines that fit into everyday life provided a strong support for maintaining achieved changes in life. They had straight forward routines such as attending meetings, and preventive routines to avoid situations and states of mind that endangered their recovery.

When attempting to take this to design, we need to find ways to support the sense of belonging and contribution that our participants talked about. Direct sharing is a powerful tool for this, but care need to be taken in how this sharing takes place, what is shared, and with whom. There are a number of ways to support people in reflecting over their routines and areas such as life logging, visualization, and context sensing provide inspiration on how to go forward. Interesting issues are how to collect material for reflection, what to collect, and how to present it to users. Another way where we can support routines through design is to explore how we can create concrete gestures to make maintenance of life style change more tangible or visible. Both physical gestures, artifacts, and media offers possibilities.

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