

# Exploring Quantified Self Attitudes

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Abstract: In recent years there is a growing optimism that health interventions may become more effective through the use of self-tracking. Related efforts are hampered by the short-lived compliance to self-tracking schemes. This paper examines the attitudes and motivations of self-trackers that could guide the design of self-tracking applications. Based on a questionnaire survey and follow up interviews a set of three personas of self trackers is proposed, in addition, design requirements are proposed for improving adherence to self-tracking technologies.

## 1 INTRODUCTION

Wearable self-tracking technologies are often put forward as a way to help ensure healthy living and to enhance active participation of patients in healthcare. However, sustained use of self-tracking technologies as part of health intervention programs remains a major challenge (Fritz, 2014), (Karapanos, 2015). A commercial study shows that 'more than half of U.S. consumers who have owned a modern activity tracker no longer use it, and third of U.S. consumers who have owned one, stopped using the device within six months of acquiring it' (Endeavour Partners, 2014). Karapanos, argues that in the case of physical activity trackers '*the disengagement can signify two outcomes: failure to integrate exercising into daily life or a swift adoption of exercising as an intrinsically motivated practice*' (Karapanos, 2015). On the other hand, there is a whole population of users who track themselves for years and where the activity is ingrained in their daily life (Fritz, 2014). They are actively engaged in the usage and the whole experience, evolving from beginners towards avid personal informatics users who have integrated self-tracking into the fabric of their daily lives (Darmour, 2013). Long term self-trackers seem to value the on-going support and motivation these technologies trigger for having a durable change in their lives (Fritz, 2014). It appears that a better understanding of long-term self trackers could be valuable in designing technologies to support self-tracking practices.

Most human computer interaction research on the topic of how people use wearable technologies follows the pattern of field testing a certain system and investigating how people interact and behave with this technology. Few studies, have examined such use 'in the wild' and engagement with such applications remains a challenge (Karapanos, 2015), (Vandenberghe, 2015), (Shih, 2015). For example, Karapanos et al, built a mobile application 'Habito' and had 256 participants use the application voluntarily. As they remark: '*However out of the 86 users who installed a physical activity tracker that we deployed on Google Play, only 21 percent of them used it for more than two weeks*' (Gouveia, 2015), (Karapanos, 2015).

In order to get more in depth information about the process of the evolution of personal informatics users and what triggers them to create a long term relationship with their device and its services, we conducted a survey among long term self-trackers and, secondly, held in depth interviews. Based on these studies we propose Personal Informatics User Design Personas that gives new perspectives and insights for future design and development of self-tracking technologies aimed at supporting behavior change.

## 2 RELATED WORK

There is already a large body of research concerning the use and none use or abandonment of self-tracking activity (Gulotta, 2016) (Epstein, 2016),

(Schwanda, 2011). The motivations as to why people are tracking themselves and the impact it has on human behavior (Lazar, 2015).

## 2.1 Motivation and Feedback

As Shwanda argues, feedback loops are an important element in getting motivated or not. As some users experience it as a successful motivator, mainly when the system gave positive feedback, but also when the feedback was a bit harsh. Additionally, they liked the nudging of the system. While others find it hard to interpret the information and furthermore also hurtful when there is negative feedback (Schwanda, 2011). The feedback we receive from those technologies are very blunt and don't show any empathy at all, as Ruckenstein states "*In light of feedback loops, people are approached as computer-like information processors, or auto-correlating servomechanisms, a living part of a dataistic apparatus that allows the reflection and regulation of specific movements and behavior*" (Ruckenstein, 2015, p. 10).

From a health perspective, a study from (Gimpel, 2013) shed light on the motivation of patients who track their own health. This study proposes a framework of five motivational factors.

*Factor 1: Self-entertainment:* motivation because of the pleasure it brings to the self-tracker, this motivation lies into the aspect that the user has fun and enjoyment in using these digital devices.

*Factor 2: Self-association:* the prospect of being associated within a community, 'community citizenship'. This is less about one's self, but more 'how one relates to a community or understanding her or his individualization within a certain environment, self-individualizing aspects within the community. The idea that a self-tracker needs a counterpart to understand him or herself mainly by comparison'.

*Factor 3: Self-design:* motivation by the possibilities of self-optimization. Self-trackers are interested in controlling and optimizing their life, whether they track mood, physical activity or other tracking aspects of their daily life.

*Factor 4: Self-discipline:* motivation due to self-gratification. The self-tracker is more motivated by the prospect of achieving certain goals, getting rewarded, or not being penalized and avoiding negative consequences.

*Factor 5: Self-healing:* motivation by the possibilities of self-healing. The self-tracker doesn't have a lot of trust in the current health system, has a sort of rebellion attitude towards health systems.

They want to have a certain independence from traditional health care systems (Gimpel, 2013).

These perspectives are an important aid in clustering our results and in defining the personas we sketch in this paper.

Furthermore, to trigger behavior change one also needs to look at the potential of 'Network Interventions' (Valente, 2010), using network data to 'influence' or 'accelerate' behavior change. Valentine reviews six classes of methods that can be used on order to influence and accelerate behavior change: opinion leaders, groups, leaders matched to groups, snowball methods, rewiring networks, and crossing network data with attributes. The method of groups and leaders matched to groups, are methods that rose during our in-depth interviews. In addition, in a study by Schmueli, et al, shows that "trust has significant more impact on social persuasion than closeness of ties in determining the amount of behavior change" within 'network interventions' (Shmueli, 2014, p. 14).

## 2.2 Stages within the Usage of Personal Informatics

In order to get a longitudinal perspective in the use of personal informatics, (Li, 2010) proposed a stage-based framework that illustrates the five stages a user goes through when using Personal Informatics systems (*preparation, collection, integration, reflection, and action*) and identified the barriers that they might experience during these stages.

In the *preparation phase*, the user is thinking about which devices to use, what they are going to track, which data they are going to collect. The barriers in this stage are: giving the devices the right information on the collecting data, do they have to switch to other tools and what are they doing with the previous data that has been collected so far.

The *collection phase* is the phase where people are observing different personal information they gathered, they get insights on their usage of the collected data, might notice a certain behavior, their interactions with others. The barriers here are that people forget about collecting data and do not review all the information that is available. The data is not always accurate or objective.

The *integration phase*, is the phase where the users integrate their different collected data. The data might come from different sources, and some put it all in excel to get a more holistic view of their collected data. The barriers of this phase, is mainly the interoperability between all these different tools of self-tracking. The *reflection phase* is the phase where users reflect on their data, today most systems

give immediate information on the device itself and the second information source, which usually more detailed is gathered on a website. With the first information source (short look), usually creates immediate awareness with the user on their behavior. The barriers in this phase, not all users can give meaning to their data, due because of lack of time, not the ability to have a holistic view of the collected data or technical limitations. Finally, during the *action phase* users will use the personal information to change behavior, to set goals or adjust goals set during the previous process.

(Epstein D. , 2015) proposed a model for lived informatics for personal informatics, comprising of three stages, initially starting with the decision to track and decide on the selection of tools to track. Choosing or deciding to track oneself could be for many reasons and include: to improve one's health, to improve one's lifestyle or to find a new life experience/activity (Choe, 2014). Deciding on the selection of tools involves comparing devices or mobile apps such as Runkeeper (running mobile application) or Human (a physical and calorie tracker) or decide to wear a wristband such as Fitbit or Jawbone to name a few options.

Stage two relates to the 'tracking and acting' process which is 'an ongoing process of collecting, integrating and reflecting' (Epstein, 2015), (Choe, 2014) notes three activities; 'collecting, integrating and reflecting' which are distinct and dependent upon data. Self-trackers learn about their behavior during the process of collecting and monitoring the data, "the main importance however, is to get meaningful insights and reflect on data to make positive change" (Choe, 2014, p. 10).

Stage three relates to the 'lapsing stage', which is associated to individuals/users who choose to stop self-tracking for a set amount of time or completely. Based upon recent research the dropout rate is quite high for several reasons, including: technology failure, lack of interest, curiosity is gone, or the cost of tracking in terms of time (Endeavour Partners, 2014), (Fritz, 2014), (Karapanos, 2015), (Shih, 2015) (Epstein, 2016).

Finally, there is 'the resuming phase', these can be short breaks, where a self-tracker has gone on holiday and forgotten to take their wearable device or they choose to have a longer break. In the latter, the self-tracker might start again by reflecting first on the older data, and then decides later to start tracking again and collecting more data depending on the tracking activity (Epstein, 2015).

Both Li and Epstein looked at the usage of Personal Informatics from a user perspective and the different phases a user goes using these technologies. Epstein added and refined the stage model by adding 'lapsing' and 'resuming' to the

tracking. Considering the challenge of people not managing to sustain self-tracking for long, we argue that resuming has a specific importance for long-term self-tracking. It helps the user to recollect previous information of the system that has been gathered before, to evaluate, to look for confirmation that they achieved in certain goals they have set. The user can pick up where they left off, set different goals, sometimes higher goals, or sometimes in a different way, in a different routine. They can compare the past achievements with the new information when picking up a certain activity again and working towards their personal best result. In addition, there is also the notion of the need of tracking, long-term user, use the past gathered information to motivate themselves again to start a new. The need to track themselves to be able to follow and evaluate their progress in a specific program or activity they have setup.

Next we will look at the personal informatics from a sociological lens where researchers have proposed typologies to define Personal Informatics users.

### 2.3 Types of Self-trackers

Taking a sociological perspective Lupton argues that '*The practices, meanings, discourses and technologies associated with self-tracking are inherently and inevitably the product of a broader social, cultural and political process*', (Lupton, 2016). Lupton underlines the sociological dimension of self-tracking, distinguishing five types: Private, Communal, Pushed, Imposed and Exploited. Here we focus mainly on the *private* and *communal modes* of self-tracking, as the users we interviewed and surveyed are using the devices or tools by choice. In a private mode, self-tracking is mainly a private activity by one's own choice, where at the communal mode, one shares tracking results within a community or others like family, friends and so forth. The remaining modes are not by choice and are a main concern in the whole movement of self-tracking: pushed, imposed or exploited self-tracking. It is known that the data we gather can also be used by others, as a surveillance tool or for commercial reasons (Lupton, 2014). Furthermore, pushed and imposed modes, are increasingly a concern as Personal Informatics enters the workplace, and the insurance space, where it is used as an incentive to stay healthy or to personalize insurances. These last three modes are therefore important user design aspects from a design ethics (Cummings, 2006) perspective. In all of these modes, a Value Sensitive Design (Cummings, 2006) should focus on

supporting human values such as well-being, welfare and human rights, trust, autonomy, data ownership, privacy, freedom from bias, accountability, for these tracking technologies.

Selke, categorizes self-tracking technologies in four basic categories according to usage: First, *monitoring health*, monitoring biometric real time data on one's body and in doing so creating a healthy lifestyle. Secondly, *human tracking*, concentrates on location tracking, mainly about the whereabouts of a person. Thirdly, *human digital memory*, outsourced memory, a comprehensive archive that document's one's life in detail. Fourth, *surveillance and counter-surveillance*, the relationship between the two, monitoring – surveillance. For example, in the workplace this surveillance is becoming a common activity, as well as counter-surveillance where people broadcast their lives as an alibi and give complete transparency on there whereabouts (Selke, 2016).

In other recent work (Seshagiri, 2016) suggests four personas that were matching user profiles in their research on personal fitness and health in India. These four personas are based on the needs and expectations of the user considering their lifestyle and fitness goals in their lives. The four personas are divided in age groups, the *competitive beginner* age group 20-30, they spent a lot of their time on social media and look for competitive environments. The majority of these personas are driven by social approval and physical appearance. They rely on their social circles to get motivated to start a fitness activity. The *passive practitioner* is in the age group 35-45, and usually settled with family and kids and start to have minor health problems that drive them to be more active and engage in fitness programs. The *challenge seeker*, are long-time fitness practitioners, age group is 30-40. Fitness is part of their daily lives. They change their goals on regular basis after achieving previous goals. They find measuring devices less useful overtime. The *active reviver*, is the persona that wants to start fitness again after a long break. Usually they find new motivation with friends and family to start again on their fitness activity. They want feedback from the apps or devices they used based on their previous usage and results gathered by these apps.

The four personas suggested by (Seshagiri, 2016), were defined from a lifestyle perspective, we try to bring something new in looking more at the personalities or attitudes users have in order to come to our three personas. Additionally, they are defined based on age groups. As in our proposal age groups are not a peculiar thing we looked at, although it was

one of the filter questions in our survey, it was not an argument to define the personas.

### 3 RESEARCH METHODS

A survey was carried out among users of wearable self-tracking technology during a period of 4 months, from January through April 2016. The distribution of the survey was done through social media, namely Facebook, LinkedIn and e-mail, with a snowball approach (N=95). We used (Qualtrics) as an online survey tool. The survey was not posted in the Quantified Self community because these avid enthusiasts are probably not representative of the broader cross section of self-trackers, arguably forming a distinct sub-culture. As previously described as a specific group by (Choe, 2014) within the Quantified Self movement today personal informatics is used by people with a specific profile, such as, software engineers, startup founders, data analysts, measuring mainly physical activity, food, weight, sleep and mood and would very likely be more motivated to participate than the average self-tracker, potentially skewing results.

Additionally, we held in depth interviews (N=10) with respondents who had been tracking themselves for an average (mean) of 4,8 years with a standard deviation of 4,29, with wearable devices, smart watches or mobile apps on smartphones as these were the most used and preferred tracking methods within the survey outcome. We used the laddering method (Reynolds, 1988) to structure the interviews as this method would give insight on tracking method Attributes (A), Consequences (C) in using a certain technology and personal value (V) respondents experience in appropriating Personal Informatics technology. The interviews were transcribed and we used the model above to map the patterns that occurred in the in depth interviews, which we will discuss in the next section.

### 4 RESEARCH RESULTS

#### 4.1 Pre-survey

The survey was distributed over a period of 4 months with a snowball sampling approach, which resulted in 95 responses (which was less than our expectation). 15 respondents reported to have stopped tracking in last 12 months and were then excluded from the survey, those respondents could

not finish the survey, they only could add the reason why they stopped tracking themselves. The remaining sample of 70 participants (49 men, 31 women) who participated in the survey was relatively skewed with regards to the education level, 80,2 % having a PhD or Masters degree, 16,3 % enrolled in higher education and only 2,5 % having a high school degree only. The sample is rather skewed towards younger ages: 55 % is between 20-30 years old, 30-40 age group represents 26,3 %, the older age group 40-50 and 50-60 represents 8,8 % and 1,3 % is >60.

Out of the 70 respondents, 15 have stopped as mentioned in the previous paragraph, in the last 12 months for a variety of reasons (see table 4):

- They track when things are going well
- Practical issues such as losing the tracker or forgetting to charge it
- The effort and time required
- Not wanting to share in social media anymore
- Obtrusiveness of the technology

We were particularly interested in the reasons why self-trackers track themselves, what they track and which tools or devices are they using to track themselves 'Out of curiosity' is the major reason why this group of respondents starts tracking themselves 36,2%. The second reason is leisure 30,5% and third is health reasons 21%. The most popular tracking activities are exercise and steps 55,9%, followed by sleep 14,5% and heart rate 13,8%. Mobile apps on smartphones are the major tool for tracking themselves 42,3%. Followed by wearable tech such as Fitbit, BodyMedia, Jawbone and so forth 32% and the smart watches 16,5% Approved medical devices and spreadsheets are a minority use 9,3 % for tracking oneself.

Respondents (91,5 %) claimed that the wearable devices created awareness. In addition, the respondents (89,8 %) agreed that the data generated by the wearable devices gives awareness. Furthermore, it was stated that the wearable devices are helping in creating habits (81,3%). Results also showed that the wearable devices helped in maintaining habits (77,9%).

We run a Pearson correlation test to test whether there is more engagement at a certain age in creating and maintaining habits. Our results show a significant positive relationship between age and creating habits [ $r(52) = .29$ ;  $p < .038$ ] and maintaining habits [ $r(52) = .627$ ;  $p = .000$ ].

Within our survey we want to get different insights on how users feel while using these technologies. As we seen in related work, emotions

and motivation are connected and users feel sometimes controlled, guilty and can become stressed about using self-tracking. Feelings of being controlled can be seen both in a positive or negative light (Epstein, 2016), (Schwanda, 2011). When using these digital devices to monitor one's health, users feel more in control of their own health and see a lot of benefits in using these digital devices in achieving their goals and getting useful insights on their behavior. Other users experience self-tracking as extra pressure, leading to more anxiety, failure and even self-hatred (Lupton, 2012).

50,9% feels controlled, 13,8% feels stressed, 50,6% feels motivated by the device. There is a significant negative linear relation between the feeling (motivation and stress) that is induced by the device. The more motivation the less stress. [ $t(52) = r = -0,33$ ,  $p = < 0,016$ ].

Most respondents don't share their data on social media 64,4%; 13,6% share their data with friends and family, 10,2% share on social media while 6,8% share in specific interest groups related do their tracking activity. This finding is inline with (Fritz, 2014), (Epstein D. J., 2015) regarding the sharing data and social effects, where respondents mostly share in specific communities related to their tracking activity. One could connect this to the theory of 'Network Interventions' (Valente, 2010), where Valente

The results of which tools and what the preferred tracking topics are with self-tracking users, are in line with the findings of Choe, et al even though they surveyed and analyzed a different target group, the quantified self meet-ups. A new finding within our survey is that users are not eager to share their data on social media, but more likely in the special interest groups and communities within the service they use. In the results we also see a decline of usage after 6 months, also this is inline with findings from Fritz et al (Fritz, 2014), (Gouveia, 2015) (Karapanos, 2015)

## 4.2 In-depth Interview

In-depth interviews were conducted with respondents who filled in the survey to clarify the above statements and survey results, which we will discuss in the next section. We divided the in depth interviews in three levels. First we asked about the attributes of the products they use. Second, we followed up regarding the consequences of using a specific technology and the tracking activity in general and, third, the values the technology brings

for the users. The results are summarized along these themes.

Mobile apps on smartphones are experienced as a major convenience for self-tracking. E.g., about wearable devices they commented *'Always on me, I never forget it, is just tracking things'*.

Regarding the use of the products we notice the distinction between active and passive tracking. Respondents mentioned that the less they have to log (passive tracking) the more they like it, just wearing the device that tracks things as opposed to logging food or mood tracking, where respondents have to actually put information in to the application, find that this is too much work and energy to sustain for longer periods.

Users stated that using apps on smartphones and wearable technology are a convenient way to measure themselves. They tend to track themselves in periods. Some track themselves continuously by just wearing the device. This is less so if they use apps on smartphones, smartphones are not always on the body and tend to be forgotten occasionally.

Most respondents set goals for themselves. We can make two distinctions within the goal setting, the daily goals and the goals that run over a certain amount of time, depending on the tracking activity. The daily goals could have the possibility to integrate in a daily life schedule, contributing towards a fundamental behavior change, progressing from extrinsic to internalized motivation and transformation (Deci, 2000). Examples are sleeping for at least 8 hours, having a 30-minute activity a day, walking at least 10000 steps in a day and so forth. These goals are usually set by the system rather than by the user. On the other hand, longer term goals are associated with higher aims, like running a Marathon for example. Once such a goal is achieved people stop tracking for a while, but will reinitiate the activity when they have another life-goal of that kind. In this process the track-record of past achievements is an important asset for the user. Other users track their weight. Goals related to this take are longer term and require a more encompassing behavior change to which the user needs to adapt to.

The respondents who work on physical activity or exercise love the competition element that some apps support by connecting with friends and stimulating each other to go an extra mile. Especially Strava (Strava, sd) seem to be doing great work in that perspective: Users can share maps, routes, and so forth. Such tracking services share their results within the service but not on social

media, thus creating the feeling of belonging to a group.

The respondents create some kind of a dependency upon the tools they use. They spoke of 'first' and 'second' information that is gathered by the device or application. First information is immediately visible on the device or application and the second information is the dashboard online where they have a more holistic and view spanning over time, by week, by month, by six months of their gathered data. The latter is not viewed often; the frequency is tied to the activity tracked. Most respondents would like to see more aggregation of their data, they experience a data silo effect between the different services and tools they use and miss context around their data gathered by different applications and wearable.

#### 4.2.1 Values

The respondents mentioned that their general goal is to create a better lifestyle *"being healthy aware"* and to be mindful of their lifestyle. Using these technologies helps them create habits (*"we don't think about it anymore"*) and routines that are consciously planned and thought about. In most cases tracking gives confirmation and makes things 'official' ip4: *"if I didn't measure it I didn't do it"*. In addition, they give the user a track record an evolution of a certain aspect of their life which motivates them to continue or resume if necessary: ip4: *"My track record of the past is important to start again I know I can do this!"* For some a technology dependency is formed, an outsourced memory that helps to look back: ip3: *"I bike more, I feel much better; things are going easier; I have less pain in my back which makes me feel better"*. In general, they see it as a digital buddy, ingrained in their daily life: ip4 *"I feel smarter I think this is an important word. I don't think about it anymore it is just there, part of my life"*. A few respondents mentioned feelings of being confronted with the data. If things are not going well, they tend to ignore it ip3 *"If I would look at the past, I might get worried, it might not be a good thing"*. Or another participant, ip7: *"If things are going well it is ok, but if I let go, I don't want to see it. I don't want a negative confrontation"*.

Using the laddering method, we were able to cluster self-trackers based on the consequences and values identified as above. As mentioned before to build the clusters of self-trackers personas, we looked at their social behavior, sharing the data, and why they are sharing data and how and where. How

they build their self-tracking attitudes, being more interested in competition for example, setting different goals to achieve, while in the third cluster we looked at how they implement the technology in their daily life, as a sort of digital mirror, trying out different technologies, and more acting as lead-users (Von Hippel, 1986).

### 4.3 Social Self-tracker

Even though personal informatics users in our research didn't like to share their data on social media, they do like to share it within the community of the application or the device and its platform that they use. They don't really have a community feeling, but do have a group feeling. Social trackers stimulate each other to do certain activities and to go for mutual goals. Long-term trackers help early trackers and stimulate them by liking or commenting on their status within the group: ip8: "I advise the use of applications to friends or colleagues and endorse them in a positive way, because I know how difficult it is". The 'communal mode' of Lupton's Self-tracking mode is referring to this accent of self-tracking, however it is not mentioning the stimuli users get from being within a group having a common interest, trying to achieve common goals. (Lupton, 2016). While studies of (Valente, 2010) and (Shmueli, 2014) show the potential of groups, leaders of groups to influence or accelerate behavior change. From the health perspective and motivation factors, the 'self-associated' self-tracker is part of the social self-tracker. 'The idea that a self-tracker needs a counterpart to understand him or herself mainly by comparison.' (Gimpel, 2013)

### 4.4 Achiever Self-tracker

The achiever's main goal is to achieve in the goals they set for themselves. They enjoy keeping a track-record to stimulate themselves to start new goals and to pursue in achieve them. They might track different aspects of their body to get more context, however not so much in detail then the next proposed persona, the immersive type or avid self-tracker. They are focused on their tracking activity and also explore different solutions and they might use them simultaneously. They have a big desire to compete with others, so they also have interest in sharing within the application they use. By tracking themselves they get confirmation The *achiever self-tracker*, has elements of the *self-discipline* self-tracker, the user is looking for self-gratification, getting rewarded for achieving goals, and avoiding

negative results (Gimpel, 2013). Additionally, there are similarities toward the *Competitive and Challenge* seeker personas proposed by (Seshagiri, 2016).

### 4.5 Avid Self-tracker

The avid self-trackers tries to create a digital mirror of themselves, they are completely engaged and immersed with self-tracking. It has become part of their daily life - a norm in their life. They are building a 'Human Digital Memory' (Selke, 2016) there is an embodiment of the technology. They love the data and they love analyzing it: ip1: 'It is important to keep the data stream'. They use custom tools to get complete overviews or they build their own overviews ip1: 'every year I start a new file in Excel, it is like gathering photos'. These self-trackers are also recognizable in the *self-design* factor motivation: 'interested in controlling their life, optimize their life, whether they track mood, physical activity or other tracking activities' (Gimpel, 2013). Their main goal is to stay aware about their behavior and keeping up a healthy lifestyle on constant basis.

## 5 CONCLUSIONS

We presented a survey and a follow up interview study that examined the triggers, motivation and ability that long-term trackers experience whilst practicing self-tracking. The survey suggests that mobile apps and wearable devices are the most used tracking methods. The top three tracking topics are physical exercise, steps and sleep.

Self-trackers use such tools to create and maintain habits. Self-tracking users don't like to share their data on social media, preferring closed communities related to the tracking service. Some people track periodically (in bursts) rather than continuously as we have seen in the consequences. They use their self-tracking track record to get up to speed again. The main goal of these self-trackers is to stay aware about their lifestyle and health. In general, respondents aim for a better state of well-being, a better lifestyle. For some the data collected gives meaning to their life.

We proposed a user typology for self-trackers. Characterized by different usage patterns and values, in addition, we based our user typology on existing typologies from other domains, from a sociological, health, lifestyle and usage perspective. Within these typologies, there is overlap and we find similarities

in their characteristics. Different types of self-trackers need to be approached differently by designers, supporting a different flow in the usage and feedback loops. For example, within Strava or Runkeeper users have more detailed data analytics over time and can receive personal coaching when they choose for a premium model (paid subscription fee). These extra features, detailed data analytics, customized feedback loops, creating group feelings, peer pressure approach by peer endorsing methods might create more engagement with the user and is subject for further research.

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