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The quantification paradox: Exploring consumer ambivalence towards self-tracking

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ABSTRACT

The spread of smart technologies has enabled consumers to monitor and quantify various and diverse aspects of their lives, making self-tracking an extremely popular phenomenon. However, the increasing popularity of self-tracking does not signify a universal positive acceptance of self-tracking practices by consumers, as indicated by the high rates of abandonment of activity tracking devices. Exploring the nuanced attitudes of active users, this study reveals that self-tracking elicits ambivalent attitudes from consumers. Specifically, it suggests that consumers develop ambivalence towards five dimensions of self-tracking: the motivational aspect, the level of familiarity, the fun factor, the social aspect and the generated data. Thus, through an empirical investigation the present paper contributes to the scant empirical consumer research on self-tracking as well as to the literature on consumer ambivalence.

Introduction

While people have always tracked aspects of their lives, the emergence and proliferation of affordable and practical smart technologies have simplified self-tracking and turned it into a popular activity for large segments of the population. Fitness enthusiasts were some of the first to accept and introduce self-tracking technologies into their daily lives; however, self-tracking is now used for many other purposes, as people track other aspects of their lives such as food intake, learning practices, work productivity, sleep patterns, sexual behaviours, social relationships and emotional states (Lupton, 2016). Numerous academic studies, from diverse fields, have emerged in recent years focusing on this phenomenon. Nevertheless, there is a dearth of studies that empirically explore the actual practices of self-tracking and consumers' attitudes towards them (Pantzar & Ruckenstein, 2015), as extant research on self-tracking is dominated by theoretical approaches (Sharon, 2017). Examining consumers' attitudes can shed more light on consumption behaviour. Attitudes not only represent a person's evaluation of a given object or experience (Ajzen & Fishbein, 1977) but also determine their behaviour. As Breckler and Wiggins (1989, p. 409) attest, attitudes are "mental and neural representations organized through experience exerting a directive or dynamic influence on behaviour". Additionally, while the popularity of self-tracking

has been increasing, a substantial number of consumers tend to abandon self-tracking after a while, which indicates that despite its growing popularity, self-tracking does not elicit only positive attitudes among consumers.

The aim of the present study, therefore, is to explore consumers' complex and nuanced attitudes towards the use of self-tracking devices. To achieve this aim, 20 interviews were conducted with users of different self-tracking tools who had tracked a number of different aspects of their lives. The findings of the present study suggest that self-tracking elicits ambivalent attitudes among consumers. Specifically, the respondents expressed ambivalence about five distinct but interrelated aspects of self-tracking: the motivational aspect, the level of familiarity, the fun factor, the social aspect and the generated data. By exploring the tensions and ambivalent attitudes associated with self-tracking, this study aims to provide an empirical contribution to the emerging literature on the consumption of self-tracking devices. In addition, by studying a contemporary consumption phenomenon, it also adds to the literature on consumer ambivalence.

The paper is structured as follows: First, the phenomenon of self-tracking is presented, and relevant literature is discussed. This is followed by an analysis of previous research on consumer ambivalence. Thereafter, the methodology and findings are presented. The paper concludes with a discussion of the findings in relation to past research.

Self-tracking

Quantified self-tracking has been broadly defined as "the regular collection of any data that can be measured about the self such as biological, physical, behavioural or environmental information" (Swan, 2009, p. 509). By using self-tracking devices and tools to track their own physical, mental or even emotional behaviours, users translate their lives into objects so as to scrutinize and transform them (Klauser & Albrechtslund, 2014). It has been argued that self-tracking is based on a positivistic understanding of the world that places immense trust in data (Maturo, 2014). In fact, self-tracking can be seen as the epitome of self-reflexivity, as future behaviours are guided and directed exclusively by data (Lupton, 2016). However, users may engage in self-tracking for a variety of reasons and, for some users, self-tracking is a form of computerized memory or even a way of documenting and making available information about their lives to future generations (Lupton, 2016). Pantzar and Ruckenstein (2017) proposed the concept of "situated objectivity" to underline that the entanglement of personal data in people's lives serves as an eclectic tool that gathers and decodes past experiences and cultural knowledge or norms and transforms life accordingly. Thus, it is suggested that self-tracking has a high motivational value (Pettinico & Milne, 2017) and enables behaviour change (Whitson, 2013). Neff and Nafus (2016) identified five common purposes of self-tracking: monitoring and evaluating, eliciting sensations, aesthetic curiosity, debugging a problem and cultivating a habit.

While it may seem like an individualistic endeavour, self-tracking is an inherently social phenomenon, as the reasons for engaging in self-tracking, as well as the meanings ascribed to it, are socially negotiated and created (Lupton, 2016). The social and communicative dimensions of self-tracking are strongly linked with attempts to shape the phenomenon into play through the gamification of the tracked experience (Klauser & Albrechtslund, 2014). Gamification also enhances the motivational value of self-tracking (Whitson, 2013).

The social influence on individuals' self-tracking practices is not limited to the interaction and communication with their peers, as, sometimes, self-tracking may not even be initiated by the user but pushed or even imposed on users by third parties (Lupton, 2014). Employers and insurance companies are such entities that have been pushing, through incentive rewards or even penalties, employees to engage in self-tracking. In particular, self-tracking practices that relate to fitness and healthy lifestyles have been promoted through corporate wellness programmes, with the ultimate aim of reducing healthcare costs and insurance premiums (Charitsis, 2019).

Notwithstanding its growing popularity, self-tracking has not been unequivocally accepted nor has it elicited only positive reactions from consumers. In fact, while a growing number of people purchase self-tracking devices and start tracking their everyday activities, it has been found that after a brief period, many users tend to discontinue using them. Ledger and McCaffrey's (2014) report on the US market revealed that more than half of users who had owned a self-tracking device had stopped using it, while one-third abandoned their activity trackers within the first six months.

While the reasons for discontinuing self-tracking have been adequately examined (see Epstein, Caraway et al., 2016; Clawson et al., 2015), the attitudes of committed users have received less attention from academic researchers. Pantzar and Ruckenstein (2015) point out that there have been few empirical studies of the actual practices of self-tracking, while Lyall and Robarts (2018) underline that there is still a dearth of empirical investigations of how users subjectively experience self-tracking. This might be the case because it is assumed that committed users only have positive attitudes towards self-tracking. However, as studies have shown, people who have abandoned their activity trackers do not hold only negative attitudes and that the rationale for the abandonment of self-tracking may also be positive (attainment of intended knowledge and goals, technological upgrade) or indirectly attributed to self-tracking (social or personal circumstances that prevent them from continuing to engage in self-tracking) (see e.g. Clawson et al., 2015; Kari et al., 2017). Similarly, it cannot be assumed that committed users express only positive attitudes towards self-tracking. In fact, while self-tracking can be seen as an enjoyable endeavour (Canhoto & Arp, 2017), it is also suggested that by focusing on measurement, activities may become less enjoyable for users of self-tracking devices (Etkin, 2016). The findings of the present study suggest that even committed users express ambivalent attitudes towards self-tracking.

Before presenting the findings of the study, the concept of ambivalence will be introduced, and previous pertinent studies that focus on consumer ambivalence will be discussed, along with studies that link self-tracking to the notion of ambivalence.

Consumer ambivalence

The concept of ambivalence has a long tradition in the fields of psychology (e.g. Bleuler, 1950; Freud, 1958) and sociology (e.g. Hajda, 1968; Merton, 1976). However, it remains an underdeveloped concept in consumer research (Szmigin & Canning, 2015). While ambivalence is a fruitful concept with which to explore consumption (O'Donohoe, 2001), it is much more common for studies to focus on a single dimension of a consumption setting or experience (negative or positive) than to explore the complexities and valences of emotions, attitudes and assessments that are associated with it (Lau-Gesk et al., 2011). However, it has been suggested that ambivalence can have a significant influence on consumer behaviour, as it can push consumers away from particular products and services (Russell et al., 2011). A notion of ambivalence that is particularly related to consumer studies is attitudinal ambivalence that emerges when people evaluate a specific attitude object both positively and negatively at the same time (Thompson et al., 1995). Attitudinal ambivalence has been used as an analytical concept in a plethora of studies in diverse areas including attitudes towards members of racial, ethnic or gender groups, towards drugs or alcohol, towards organ donation as well as towards consumer behaviour (Jonas et al., 2000).

Otnes et al. (1997) conducted the first systematic analysis of consumer ambivalence. Examining psychological, sociological and cultural theories on ambivalence, the authors defined consumer ambivalence as:

> the simultaneous or sequential experience of multiple emotional states, as a result of the interaction between internal factors and external objects, people, institutions, and/or cultural phenomena in market oriented contexts, that can have direct and/or indirect ramifications on prepurchase, purchase or postpurchase attitudes and behaviour (p. 82).

Their study identified four distinct but closely related antecedents related to consumer ambivalence: incongruence between reality and expectations, overload of consumer choices and tasks, conflicts over roles and conflict over customs and values (Otnes et al., 1997). Subsequent studies have attempted to enhance understanding and knowledge of consumer ambivalence. O'Donohoe (2001) identified three sets of tensions in consumers' attitudes towards advertising: consumers perceive advertising as a medium with a unique historical and cultural identity but draw on their own cultural understanding and conventions to make sense of it; they can enjoy and appreciate the hedonic, aesthetic and intellectual value of advertising, despite the repetition in content and form; and they can feel simultaneously immune and vulnerable to the persuasive and ideological powers of

advertising messages. Karanika and Hogg (2010) maintained that consumption may trigger ambivalent emotions and engender a sense of a "baffled" self for consumers who try to negotiate between opposing identity positions. Ambivalence has also been examined in relation to consumers' attitudes towards the use of technology. Mick and Fournier (1998) explored the paradoxes surrounding the omnipresence of technological advances in modern life. Consumers develop ambivalent attitudes towards personal technology because, while they enjoy the benefits they receive from using this technology, they are often frustrated by it (Johnson et al., 2008) and concerned about the potential risks (Lee & Rha, 2016).

Consumer ambivalence and self-tracking

The concept of ambivalence has also been previously linked, albeit insufficiently, to self-tracking. Lupton (2016) suggested that some users may develop ambivalent attitudes towards self-tracking as it can engender feelings of failure and self-hatred; it can stimulate obsessive behaviours; or it may even be perceived as a sign of weakness. However, while Lupton employed the term ambivalence, the indicative examples that she presented suggest that ambivalence is used to highlight negative feelings and attitudes expressed primarily by former users rather than the explicit co-existence of both positive and negative attitudes. Epstein, Kang et al. (2016) explored the perspectives of lapsed/inactive users of a specific activity tracker (Fitbit). According to the study results, the respondents claimed that they had learned what they had intended to learn. However, by expressing negative feelings about self-tracking and feeling guilty and frustrated about not remaining engaged in self-tracking, the respondents, according to the authors, also expressed conflicting feelings and ambivalence towards self-tracking. Nevertheless, the quotes presented indicate that the respondents were more indifferent or uncertain than ambivalent towards self-tracking.

Ploderer et al.'s study (2012) also linked the concept of ambivalence to self-tracking, as it highlights "the ambivalent stance towards self-tracking technologies for behaviour change" (p. 491). However, the study was not conducted with self-trackers; it focused on smokers and recent ex-smokers and explored their attitudes towards the potential use of a fictitious self-tracking tool for smoking cessation. In addition, the specific context of their study denotes that ambivalence was not necessarily attributed to the (potential) use of self-tracking technologies but also characterized the attitudes of informants about the behaviour change itself, in this case, smoking cessation.

In contrast to previous studies, the present study focuses explicitly on the co-existence of positive and negative consumer attitudes and feelings towards self-tracking, as voiced by users of self-tracking tools and devices. Before presenting the empirical findings, the following section will outline the method used in the study.

Method

This study has an exploratory character as it seeks to explore users' nuanced attitudes towards self-tracking. To achieve this aim, an interpretative qualitative approach was chosen as most appropriate, as qualitative methods allow the in-depth exploration of people's attitudes, feelings and motivations (Proctor, 1997). Twenty semi-structured interviews were conducted with experienced self-trackers in Sweden. The study was advertised in the local region through flyers and posters as well as targeted posts in appropriate local groups in social media. Snowballing was also used to recruit additional participants. Ten men and ten women participated in the study, and all participants received a cinema voucher for their participation. To qualify for the study, informants had to be experienced and active self-trackers, irrespective of activity (or activities) or self-tracking tool. Respondents were initially asked to state what activities they tracked and describe the process of self-tracking. Attention was paid to what motivated respondents to engage in self-tracking in the first place and whether the initial motivations and expectations had been met. The interviews also covered issues that have been identified in previous pertinent literature, like the social aspect and the motivational dimension of self-tracking. Respondents were further asked to reflect on their engagement with the generated data, describe how they used the data and explain how data had helped them (or not) to achieve their goals.

As expected, the vast majority of the informants (18 out of 20) had used activity trackers to monitor different fitness activities, with running being the most common self-tracked activity (13 informants). Besides fitness activities, the informants had also used self-tracking tools to monitor sleep, work, time, personal finances, food intake and the menstrual cycle. The interviews were conducted in English in face-to-face meetings and lasted on average around 20 minutes. They were audio recorded and transcribed verbatim. Table 1 provides an overview of the research participants (names have been omitted for anonymity purposes).

The analysis of the findings was iterative during the course of the study and allowed for emerging themes to be discussed in subsequent interviews. Repeated revisiting of data is fundamental for reflexive iteration, as it allows for insights and themes to emerge and enables the refinement of the focus of the study (Srivastava & Hopwood, 2009). For Spiggle (1994, p. 495), iteration "involves moving through data collection and analysis in such a way that preceding operations shape subsequent ones". Thus, data collection and data analysis are not performed at different stages; the analysis of the data is performed during the data collection process, influencing and guiding that process.

In the present study, the analysis through open coding of initial interviews indicated the presence of various contrasting themes and categories which led to the adoption of ambivalence as a pertinent analytical framework. Further data collection and data analysis though axial coding allowed for the reshaping of the ambivalence themes presented in the findings.

Table 1.

Respondent #	Self-tracking experience	Age	Activities tracked
1.	3 years	41	Steps, Weight, Cycling, Canoeing, Work, Sleep, Food, Location
2.	2 years	25	Running, Weight-lifting, Roller-skating, Sleep
3.	6 years	26	Cycling, Skiing, Running, Sleep, Food, Steps
4.	3 years	22	Running, Weight-lifting, Skiing, Swimming
5.	2 years	25	Kayaking, Fitness activities
6.	1 year	29	Personal finances, Menstrual cycle
7.	On and off for years	36	Running, Steps
8.	2.5 years	30	Running, Steps
9.	6 years	51	Pulse, Cycling
10.	8 years	25	Finances, Sleep
11.	5 months	22	Steps, Fitness activities, Pulse, Sleep
12.	5 years	38	Fitness activities, Running, Floorball
13.	2 years	30	Walking, Running, Cycling, Fitness activities
14.	1 year	27	Steps, Fitness activities
15.	10 years	25	Pulse, Running, Cycling, Walking
16.	1.5 years	25	Running
17.	5 years	32	Running, Fitness activities, Sleep
18.	2 years	25	Running, Sleep, Food
19.	2-3 years	38	Running, Cycling, Walking, Fitness activities, Time
20.	3.5 years	29	Running, Walking, Cycling

Findings

The study reveals that practices of self-tracking elicit ambivalent attitudes from consumers. Specifically, it suggests that consumers develop ambivalence towards five dimensions of self-tracking: the motivational aspect, the level of familiarity, the fun factor, the social aspect and the generated data. Table 2 presents an overview of the five main themes identified from the analysis of the data and provides a description of each theme.

Table 2.

Ambivalence towards…	Description
Motivation	Co-existence of motivation and pressure
Level of familiarity	High and low levels of familiarity can trigger both positive and negative attitudes
Fun factor	The tracked activity can become both more and less entertaining
Social aspect	Social dimension elicits both positive and negative reactions
Generated data	The value of the generated data is acknowledged but also questioned

Ambivalence about the motivational aspect of self-tracking

Self-tracking has been promoted as a powerful motivational tool for people who wish to make lifestyle changes. The study respondents also stated that self-tracking helped them become and stay motivated in reaching their personal goals. However, they also expressed negative sentiments, as the continuous use of self-tracking tools could also trigger pressure and stress among users. A response from respondent #17 illustrates the presence of both positive motivational emotions and negative emotions pertaining to added pressure:

> At first, it was just to know how far and how fast I ran, and then it became a motivation to run further and faster and get better, but also, it has been stressing me in parts of my life. It's easy for me to get obsessed with things, and in periods that I have been training too much, I have felt that it's no good for me to track, and I have to stop for a while and just go out and run if I feel like it.

Overuse of and overdependence on self-tracking that may reach the level of becoming obsessed with it was further expressed by respondents. It was also underlined that the obsession with self-tracking could even become a sort of addiction which offered a motivational rush in the beginning but could end up becoming quite burdensome and even having a negative effect on users' social life. The lack of personalization that meant users had to adhere to general guidelines was also identified as having both a positive and negative motivational effect. Respondent #18 stated that the best thing about self-tracking was the motivation that she received, but she also highlighted the additional pressure that was produced by standardized goals.

> The best thing was that it motivated you to try harder and kind of know what you have done in order to keep trying.

> I even think sometimes that it could be very harmful because your body may need more in order to gain goals. So, basically, you are starving and punishing yourself more than you actually should, just because your body works differently, because it's not that personalized.

Ambivalence about the level of familiarity with self-tracking

It has been suggested that the majority of people who start using self-tracking devices end up abandoning them once the novelty of self-tracking has worn off. The findings of the present study suggest that both low and high levels of familiarity with self-tracking may elicit ambivalent attitudes from users. A response from respondent #10 is characteristic; she admitted that, on the one hand, the novelty element first attracted her to tracking one of her activities (sleep) but that once that novelty had worn off, she could no longer see the point of continuing:

> I think it was just the novelty like, oh this is quite cool. I could see how I was sleeping, and… but after a few days, the novelty wore off, and I just thought that this is kind of pointless really.

On the other hand, for another activity that she was tracking (her finances), her attitude was exactly the opposite, as she did not find it useful at the beginning. However, once she understood how it really worked, she could see the benefits of self-tracking:

> At first, I didn't want to do it because I thought it was stupid. I didn't need to do it. But once I started doing it, I realized that it was quite beneficial because I could see exactly how much I had in all these different places, and I could predict how much I would have in the future.

Fear of the unknown was also expressed by other respondents. Respondent #17, who was a knowledgeable self-tracker, as she had been successfully tracking one of her daily activities, was experiencing problems with her sleep and contemplated whether tracking her sleeping habits might help resolve these problems. However, as she had never tracked her sleep, she was afraid of trying it.

Some respondents stated that self-tracking became repetitive over time. In addition, once they had become familiar with the whole process they felt they didn't have much more to gain from self-tracking and often stopped or took a break from self-tracking. Respondent #1 who was a competitive athlete also expressed similar feelings about tracking daily activities (like diet and calorie intake) as he discovered that after tracking for a while he had gained enough knowledge to no longer need to self-track. However, as a competitive athlete, he also felt that self-tracking gave him an extra boost to keep improving his performance.

Ambivalence about the fun factor of self-tracking

For most respondents, self-tracking was an entertaining experience in itself as it augmented the fun of the activity that they were tracking. However, the constant focus on metrics could also "cheapen the experience", as respondents stated, and turn it into work rather than play. Even respondents who expressed their enjoyment, as self-tracking had helped them reach their goals, acknowledged that being under constant (self) scrutiny took away from the satisfaction. Thus, it was felt that self-tracking could render the experience less relaxing which engendered conflicting feelings among respondents. This could even lead to a temporary cessation of tracking in an attempt to return to a purer experience. Respondent #20's response is illustrative of the ambivalent attitudes expressed by various respondents:

> I've had very mixed feelings – some periods, I use self-tracking quite a lot, it's fun, it's a kind of fun game to play with, in addition to being kind of interesting

> in monitoring your progress. While in other periods, it's almost cheapening the activity – like there's something nicely pure about a long-distance run through a woodland trail and not having a bunch of gadgets with you and a voice that keeps telling you how far you've gone – it makes it less pure, so periodically, I go without tracking.

Respondent #15, who had extensive self-tracking experience, expressed similar mixed feelings. While she found that self-tracking added to the fun dimension of the tracked activity, it also put more pressure on her:

> It is a bit of a pressure sometimes when you have to watch the watch all the time, and you think "oh I have two pulses less, I have to go up" instead of just running and not thinking about it.

Ambivalence about the social aspect of self-tracking

According to the existing literature, the social aspect is an important component of the self-tracking experience. However, the findings of the present study suggest that the social aspect may not only be a positive factor, but may also elicit negative reactions. The research indicates that similarly to the practice of self-tracking itself, which instigates both positive feelings of motivation and negative feelings of pressure, the social aspect of self-tracking can simultaneously motivate users and be a source of added pressure. The pressure becomes more prominent when self-tracking is pushed by external actors, like employers. Respondent #7 started using self-tracking devices when her employer offered them to employees who were encouraged to use them to track their daily activities and enter weekly competitions. While, for her, this had been a positive experience, as she was already undergoing significant training and self-tracking helped her improve, she acknowledged that other people who might not have been training, or who might not even have been interested in training or tracking, could have felt pressurized to follow their colleagues and engage in self-tracking activities.

Competition among users also evoked mixed feelings. Respondent #9 stated that competing with other self-trackers had proved very helpful for him, as it had enabled him to push himself more and improve his performance. However, he warned that it could lead to dangerous behaviours, alluding to cases in which people were involved in accidents due to taking unnecessary risks in order to win self-tracking competitions. Respondent #8 commented that although there was no interaction between users in the self-tracking tool that he was using, it could be beneficial if people whom he already knew could get involved and "challenge" each other. However, the respondent stressed that it could also have negative effects as it could lead to harassment from people you did not know.

It was further suggested that the social aspect added a level of superficiality to the experience. Respondent #1 who had shared his self-tracking results with friends in the past was not so keen on continuing to do so as it felt like trying to show off his

personal accomplishments and status:

> I mean that's like bragging, or maybe it's not so interesting for other people to know. I mean "OK now I've lost half a kilo of weight every week". "OK, good for you".

Ambivalence about the generated data

Self-tracking revolves around data generation as data provide meaning to the act of self-tracking. The motto of the quantified-self community is unambiguous as it highlights that self-tracking is about attaining "self-knowledge through numbers". In essence, self-tracking is about bestowing trust in the generated data and expecting to gain valuable insights about oneself by reflecting on these data. For most of the respondents, self-tracked data had proven to be valuable and helpful in their everyday lives. However, they also raised concerns about the generated data as well as their potential value, especially since the accuracy of the data was questionable. The – perceived or real – inaccuracy of the results caused distrust and frustration among respondents. For instance, respondent #4 who tracked the calories that he burned during an exercise recounted that he always burned exactly twice the amount of calories as his girlfriend, which to him was quite odd and made him question the accuracy of the results that he was getting:

> My girlfriend, no matter what, I always burn exactly twice the amount that she does. But, the funny thing is, she doesn't weigh half my weight.

The generation of inaccurate results was also raised by respondent #7, who expressed her frustration as she shared her results with other users:

> The frustrating part is that it's not always very good where I'm running. I live out in the countryside. Sometimes it would tell me the wrong things, it would tell me that I haven't been running as far as I have, and that's very frustrating because this is also, sort of, published to people I'm friends with.

The inaccuracy of the results also prevented users from tracking other activities beyond those that they were already tracking. Respondent #18 suggested that she would like to track her sleeping behaviour but that because she thought that the results from her self-tracking running activity were inaccurate, she could not trust self-tracking for her sleep.

Discussion

The phenomenon of self-tracking generates polarizing sentiments on the continuum from fervent supporters to outspoken critics (Sharon, 2017). However, the present study shows that regular users of self-tracking devices express mixed feeling and attitudes about a number of aspects relating to the experience of self-tracking. The

present study thus adds to the stream of consumer research studies that suggest that consumer settings and experiences do not engender either/or sentiments and attitudes in consumers, but much more complex and mixed responses, full of tensions, paradoxes and ambivalences. Consumer ambivalence has been previously discussed in relation to the use of technology, notably in Mick and Fournier's (1998) study. In the last couple of decades, however, technology has become considerably more prevalent in everyday life. In particular, smart interactive technological affordances have become such a vital part of people's daily activities that they play an important role in reconstructing consumers' subjectivities. Despite their pervasiveness, the present study shows that smart sensor technologies that track users' activities can generate consumer ambivalence, related to various different aspects of the practice of self-tracking.

To begin, the present study indicates that while users acknowledge the motivational power of self-tracking devices, they also underline the negative pressure that derives from self-tracking. The motivational aspect is further enhanced by the incorporation of game-like elements that aim to make self-tracking a fun activity (Whitson, 2013). Such attempts have been partially successful, as users indicate that self-tracking also reduces the "relaxing" element of certain activities and can even "cheapen" the experience of an activity. In addition, according to Canhoto and Arp's (2017) study, users regard self-tracking as an enjoyable endeavour. However, the present study suggests that while self-tracking may evoke feelings of enjoyment or even enhance the fun factor of previously untracked activities, it can also have the opposite effect, as it can turn play into work. In that respect, these results support the findings of an experimental study (Etkin, 2016), in which it was suggested that by focusing on measurement, activities may become less enjoyable for users of self-tracking devices.

In addition, data and metrics constitute the crux of self-tracking as it is through careful reading and analysis of the generated data that users attempt to monitor and control their actions. The present study, however, indicates that the attitudes of users towards the generated data are nuanced, which makes them develop a more cautious approach towards self-tracking. While most respondents generally recognized the value of the generated data, they also raised concerns about the accuracy and usefulness of these data and expressed dissatisfaction about the dissemination of inaccurate results to other users.

The high rates of abandonment of self-tracking devices and the ambivalent attitudes of active users towards the generated data, the motivational effect and the enjoyment derived from the self-tracking experience, as identified in this study, suggest a metric overload that puts additional pressure on users to "perform". This can lead to metric and tracking exhaustion and engender even higher rates of abandonment. From a practical standpoint, this means that, instead of constantly pushing people to track all their activities, self-tracking devices could also employ features that would remind users to occasionally unplug their devices and take a break from self-tracking by engaging in unquantified activities. While this may

seem counterproductive, in the long run it could ensure that more users remain actively engaged in some form(s) of self-tracking.

Moreover, familiarity with self-tracking, getting to grips with the necessary knowledge and having a feeling that nothing new can be learned through self-tracking are some of the reasons that have been identified in previous studies for the abandonment of self-tracking devices (Clawson et al., 2015, Kari et al., 2017). These reasons were also echoed by the respondents of the present study, although opposing attitudes were also expressed. The novelty of the experience was identified not only as a driver for engaging in self-tracking, but also as a hindrance to taking up self-tracking, as users either felt uncomfortable about the results that they might get or could not understand the point of tracking certain activities. This finding signifies the need, on the one hand, to better educate consumers about self-tracking technologies and on the other to develop features that will retain the interest of seasoned users.

The existing literature has also underlined the significance of the social aspect of self-tracking (Klauser and Albrechtslund, 2014; Lupton, 2016). In their report, Ledger and McCafrey (2014) identified social motivation as a key factor in the long-term success of a self-tracking system. Canhoto and Arp's (2017) study also suggested that, for many users, the social dimension of self-tracking is an important factor in the adoption and sustained use of health and fitness wearables. However, the present study only partially supports these claims. Along with the positive effect of social motivation, the respondents also voiced negative attitudes about the peer pressure that they might experience through social interaction with other users. This may be attributed to the fact that the social aspect of self-tracking is tightly linked to a competitive ethos that is fostered through different affordances. This finding suggests that social interaction may be better developed not through competitions and rivalry but through teamwork and social support. Connecting users with different expertise and experience could further enhance the social aspect of self-tracking and minimize the ambivalent attitudes of both novice and seasoned users.

To sum up, the findings of the present study imply that self-tracking should become less disciplinary and more playful. Striving to supplement self-tracking with a number of different metrics of questionable accuracy may provide little value to consumers' self-tracking experiences and even make them more stressful for consumers. Instead, it is advisable that focus is placed on gamification affordances that are not directly related to the generated data that would enhance the enjoyment of the tracking experience and allow for non-competitive social interactions to develop.

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Abstrakti

Kuluttajat pystyvät älylaitteiden avulla tarkkailemaan ja mittaamaan elämäänsä. Itsensä mittaamisesta on sen seurauksena tullut äärimmäisen suosittua. Kasvava suosio ei kuitenkaan tarkoita, että kuluttajat suhtautuisivat yksinomaan myönteisesti mittauslaitteiden käyttöön. Tutkimusten mukaan aktiivisuusmittareiden käyttö usein lopahtaa ja laitteet hylätään. Tämä empiirinen tutkimus pureutuu yksityiskohtaisesti aktiivisten käyttäjien asenteisiin ja osoittaa heidän ambivalentin suhtautumisen itsensä mittaamiseen. Ambivalenssia tarkastellaan viiden ulottuvuuden avulla: motivaatio, itsensä mittaamisen tuntemuksen taso, hauskuus, sosiaalisuus ja tuotettu data. Tutkimus tuo tarpeellista lisävaloa itsensä mittausta ja kuluttajien ambivalenssia käsittelevään kirjallisuuteen.