

**Motivational Consequences of Self-Tracking and Sharing of Training Data among
Elite Endurance Athletes**

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Abstract

In the current study, we investigated how self-tracking with modern sports watches and sharing of training data via the social network Strava psychologically influences Norwegian elite middle- and long-distance runners and whether this can have implications for their training. We used a qualitative design, including semi-structured interviews, interviewing nine athletes between 19-29 years of age who all were qualified for the Norwegian Championship in athletics. Five of them were men, and four were women. Data were analyzed using Braun and Clarke's (2022) reflexive thematic analysis. Results were discussed in light of the Self-determination theory (SDT; Ryan and Deci, 2000). Our findings suggest that self-tracking gives athletes more feedback on how well they are performing in their training, consequently affecting their motivation based on positive or negative perceptions of their performance. Furthermore, self-tracking allows athletes to see how well they perform their training in relation to specific standards regarding pace, distance, and duration. These standards can have implications for the choices they make in training. Sharing training data on the social network Strava can be fun and inspiring, but it can also induce a controlling factor that makes it harder to adjust the training if needed. Athletes are sometimes aware that there can be both positive and negative consequences of self-tracking and sharing of training data and therefore have reported strategies for avoiding the adverse effects.

Lay summary: In the current study, we investigated how self-tracking and sharing of training data on social media can influence Norwegian elite middle- and long-distance runners' motivation and subsequent training.

Keywords: motivation, self-tracking, social media, elite sports

For decades, athletes have been encouraged to keep a diary of their training activities and performance (Pettinico & Milne, 2017, p. 282). Coaches and athletes quantify training for training prescriptions, systematization of training, and motivation (Hopkins, 1991, p. 162). Hence, there is nothing new about self-tracking training, but with the development of technology, it has become more accessible and precise. Appropriate monitoring of training load can aid in determining whether an athlete is adapting to the training and minimize the risk of developing non-functional overreaching, injury, and illness (Halson, 2014, p. 139). It is suggested that live and post-performance data from sport tracker devices can give an advantage over people that do not have such data (Ng & Ryba, 2018, p. 7). The technologies installed in wearable devices record various metrics automatically without active user engagement and have made data collection about oneself easily available—a practice known as self-tracking (Stiglbauer et al., 2019, p. 131). A device for self-tracking utilized among endurance athletes is the sports watch with embedded functions like GPS and heart rate monitors. The integrated GPS provides precise calculations regarding distance, speed, and altitude and allows the runner to see the route on a map after the run (Cummins et al., 2013; Pobiruchin et al., 2017). Distance covered and stopwatch have been reported as the most prevalent tracking functions in competitive runners (Diotaiuti et al., 2020, p. 60). In recent years, there has also been a growth of apps where you can analyze and share your training data with others. One of the apps is Strava, designed to both track performance statistics and be a social network where one can share activities with friends and followers (Strava, 2022).

In the current study, we investigate how elite middle- and long-distance athletes are influenced by self-tracking in their training and sharing of training data. The analysis has a specific focus on motivation and how this may affect their training. There

has been a growing interest in using self-tracking technologies in physical activity, with an increasing amount of research on the topic (Jin et al., 2022, p. 242). Studies have found that self-tracking can increase motivation for physical activity and satisfy psychological needs (Karapanos et al., 2016). Findings in a qualitative study conducted by Mopas and Huybregts (2020, p. 31) indicated that data recording allowed the participants to chart and to chart and visualize their process. Some enjoyed reviewing their records to see how many hours of training they had done. Many also used the data to see if they had gotten stronger or faster over time. Although seeing the numbers were exciting and fun, many participants admitted to being obsessed with tracking their data and emotionally invested in their numbers. For example, they described feelings of happiness, gratification, and pride after running a personal best or seeing an increase in their average pace (Mopas & Huybregts, 2020). Further, seeing that they could not meet personal expectations felt demoralizing. For example, one athlete emphasized that he became frustrated when coming back after a break and seeing that he was a lot slower than before (Mopas & Huybregts, 2020, pp. 31–32).

It has also been found that self-trackers can induce dependency and lead to less motivation for physical activity if the tracker is unavailable (Attig & Franke, 2019). Another motivational cost found when using self-tracking devices in a study by Etkin (2016) was that even though counting steps led the study participants to be more active, their enjoyment of walking decreased and made walking feel more work-like. It was argued that this effect likely occurred because when measuring and quantifying performance, attention is drawn away from intrinsic joys toward external rewards, an effect which has been well documented earlier (Deci et al., 1999). Although, these studies were not done in an elite sport setting. Therefore, the studies looking at motivational effects may not apply to such a group. Differences in how high-level

athletes and amateurs perceive self-tracking devices have been documented (Rapp & Tirabeni, 2020, p. 7), where self-tracking devices motivated amateur athletes to train. Still, for high-level athletes, the devices were seen more as training companions than motivators (Rapp & Tirabeni, 2020, p. 7). In addition, published research literature indicates differences in strategies for usage in competitive runners with high and low competitive experience (Diotaiuti et al., 2020). The differences may be tied to high-level athletes who typically differ consistently from amateurs regarding various perceptual, cognitive, and strategic aspects of behavior (Swann et al., 2015, p. 4). To the author's knowledge, no studies have considered the motivational aspects of self-tracking training with modern sports watches for elite athletes.

Self-tracking as a social practice in sports using social media networks has also been given limited research investigation (Couture, 2021, p. 184). However, in a qualitative study of recreational runners who were also Strava users, Couture (2021) found that this social network could be motivating and that the participants enjoyed seeing other people's training and improvement. Strava users felt terrific sharing with others that they achieved their goals. Contrary, Strava could contribute to the users feeling worse when they saw others doing exercises they were incapable of themselves. One participant drew parallels to other social media apps, where seeing others have a glamorous life while not having it yourself can make you feel bad (Couture, 2021, p. 190). Those findings resonate with research on other social media apps, for example, Instagram, where exposure to pictures and stories about other people's lives that seem more exciting and satisfying than their own can adversely affect well-being (Faelens et al., 2021). Several participants in Couture's (2021) study also implied that it was important for them to post their workouts on Strava. A popular expression was "If it isn't on Strava, it didn't happen" (Couture, 2021, p. 195), a phrase often said half-

heartedly and with a smile on their face, but also with a certain degree of seriousness. Importantly, these athletes were recreational level athletes, and these findings do not necessarily apply to athletes at higher levels (Swann et al., 2015, p. 4).

In the current study, we aim to examine elite-level middle and long-distance runners' self-tracking, specifically by means of sports watches and the social media network Strava. We investigate how this affects motivation and whether this, in turn, influences their training. In light of the Self-determination theory (SDT; Deci & Ryan, 2000), which is an empirically based, organismic theory of human behavior and personality development (Ryan & Deci, 2017, p. 3). Sport tracker devices have lots of opportunities to give feedback on individuals' performances which is something that in SDT is seen as a factor that may influence motivation (Ryan & Deci, 2000a, p. 58)

Self-Determination Theory

SDT is a multidimensional theory of human motivation that builds on the basic needs of autonomy, competence, and relatedness (Ryan & Deci, 2000a). Satisfying these basic psychological needs will lead to the experience of wellness, proactivity, and positive development (Standage & Ryan, 2020, p. 38). Frustrating these needs will lead to poorly integrated motivation and lower well-being (Vansteenkiste et al., 2020), leaving one prone to passivity, fragmentation, and ill-being (Vansteenkiste & Ryan, 2013). Thus, need satisfaction or need frustration can lead to both "bright" or "dark" sides of human functioning (Ryan & Deci, 2000b). All three psychological needs are beneficial for well-being and motivation, but each need's relative role may differ depending on the situation (Deci & Ryan, 2000). In sports and exercise settings, it is argued that the need for competence is more salient than the two other needs due to the competitive nature, which gives many opportunities to measure competence (Reinboth et al., 2004).

SDT distinguishes between intrinsically and extrinsically motivated behavior (Ryan & Deci, 2000, p. 54). When an individual is motivated by outcomes external to the activity itself, he or she is extrinsically motivated. If the action is done purely because it is interesting or enjoyable, he or she acts out of intrinsic motivation (Ryan & Deci, 2000, p. 56). In SDT, motivation is not seen as static and can change over time. Intrinsic motivation has been associated with better learning, well-being, and performance (Cerasoli et al., 2014; Deci & Ryan, 2000, p. 233). Therefore, the conditions that undermine versus facilitate intrinsic motivation have been given considerable attention. Cognitive Evaluation Theory (CET; Ryan & Deci, 2000a) is a mini-theory within SDT that aim to explain which factors lead to variability in intrinsic motivation. In CET, it is argued that feelings of autonomy and competence can either be facilitated or frustrated by external events and lead to nurturing or diminishing intrinsic motivation (Ryan et al., 2009, p. 110). Interpersonal events, such as feedback, rewards, or evaluation, can enhance the feeling of competence and thus enhance intrinsic motivation. However, this will depend on how the individual perceives external events. External events can also be perceived as controlling behavior, likely reducing intrinsic motivation (Ryan & Deci, 2000a, 2017).

Training data provided by sports watches and apps can give athletes feedback on their performance and evaluate how they are doing. A key question is how the feedback from this training data influences intrinsic motivation. When people engage in activities with opportunities to feel mastery, positive feedback is expected to enhance intrinsic motivation because the need for competence is supported (Burgers et al., 2015; Mabbe et al., 2018; Vallerand & Reid, 1984; Vansteenkiste & Deci, 2003). Negative feedback, on the other hand, can lead to devaluing competence and thus decrease intrinsic motivation (Ryan & Deci, 2017, p. 156). However, if the individual knows how to

improve, negative feedback can have a less detrimental effect on intrinsic motivation (Hu et al., 2016).

Another aspect of feedback, according to CET, is if feedback is given publicly or not. Public feedback delivery is expected to induce a more significant external pressure because others are aware of the performance, which can decrease intrinsic motivation (Deci & Ryan, 1985). Plant and Ryan (1985) argued that if people are aware of themselves as if through the eyes of another, it can result in they will have an evaluative glance towards themselves, which can function as a controlling aspect. This is important to consider when athletes post their training data on the social app Strava. When others can see their training and may be evaluating it, this is an external factor that can decrease intrinsic motivation. Again, external events will not influence intrinsic motivation per se but are determined by how it is perceived by the individual (Deci & Ryan, 2000). An observer can control the behavior if he is perceived as evaluative about the performance. At the same time, if he is just seen as a curious onlooker, he will not likely be perceived as controlling (Enzle & Anderson, 1993).

Not all behavior is inherently interesting or enjoyable. In SDT, it is called extrinsic motivation, when an activity is done to achieve an outcome outside the activity (Deci & Ryan, 2000). For example, since competition is seen as an extrinsic factor (Weiss & Ferrer-Caja, 2002), exercising to enhance skills to do better in competition can be extrinsically motivated. Ryan and Deci (2000) argue that extrinsic motivation can vary significantly in the degree of autonomy, which they describe in another mini-theory in SDT called Organismic Integration Theory (OIT). Ryan and Deci (2017) defined four types of extrinsically regulated behavior. The most external is called *external regulation*, in which one acts to obtain rewards, avoid punishment, or comply with social pressure. The second type of external motivation is *introjected regulation*,

where one acts because of a feeling of pressure to avoid guilt or to attain pride – one acts in a sense that one "should" or "must" do something to gain others' approval. Ryan and Deci (2017, p. 187) highlight that this type of regulation can induce a kind of effortful self-control that may be unhealthy because it suppresses the need for autonomy. Suppressing basic psychological needs can lead to loss of motivation, disengagement, and experiences of ill-being (Vansteenkiste et al., 2020, p. 10). The third type of external regulation is *identified regulation*, a more autonomous type of motivation where one acts because something is important to oneself. The last type is *integrated regulation*, where one is motivated for an action that is important to the self and in line with one's other values, basic psychological needs, and other identifications. Which type of regulation one acts by when performing an activity is not seen as static and can change over time. Furthermore, if someone is not intrinsically motivated for an activity nor regulated by any of the extrinsic types of regulation, he or she falls into the category of amotivation. When amotivated, one has no intention to act in an activity (Ryan & Deci, 2017, p. 190). Central to OIT is that people have a natural tendency to transform controlled types of extrinsic regulations into more autonomous ones (Ryan, 1995). This process is known as *internalization* (Deci & Ryan, 2000). The more autonomous regulations have advantages in the form of higher well-being and more persistent motivation since they satisfy basic needs (Vansteenkiste & Ryan, 2013). To have more self-determined motivation has been shown to predict higher performance for athletes (Gillet et al., 2009).

Method

In the current study, we conducted semi-structured interviews and a reflexive thematic analysis (Braun & Clarke, 2019). Thematic analysis (TA) is "a method for identifying, analyzing, and interpreting patterns of meaning (themes) within qualitative

data" (Clarke & Braun, 2017, p. 297). Braun and Clarke (2019, p. 594) have named their approach *reflexive* thematic analysis because that name seems to capture what is distinctive about this approach compared to other versions of TA. In the current study, we used a relativistic ontology. Within this, there is an understanding that there is no social reality independent of us that can be accessed and that facts are subjective, created, mind-dependent, multiple, and change over time (Smith & Sparkes, 2009). Further, we used the epistemological position of social constructionism, where the core is that the social world is constructed and that individuals seek to understand the world they live in (Creswell & Poth, 2016, p. 24).

Participants

Ethical approval was obtained from the Norwegian Centre for Research Data (NSD). Nine athletes competing in middle- and long-distance running, five men and four women, were purposefully sampled to participate in one semi-structured interview. We wanted to examine athletes on a high-performance level. Therefore, an inclusion criterion was that they qualified for the Norwegian Championship in Athletics. Eight athletes did athletics as their primary sport, with their main distance ranging from 1500m to Marathon. One athlete competed in orienteering as the primary sport but also competed in athletics and did most of the training with an athletics group. The athletes aged from 19-29 years. All of the athletes qualified for the Norwegian Championship in athletics. Five of them had competed in European Championships in athletics, either at the senior level (three of them) or at the U23 level. One additional athlete had run faster than the qualification time for the European Championship. The orienteering runner has also competed in European Championships in orienteering. Their performance scores on the IAAF scoring table ranged from around 850 points to well above 1100 points. We refer to the participants as "elite athletes," although this is hard to define, with different

studies using different definitions of elite athletes (Swann et al., 2015). In a review where Swann et al. (2015) mapped how elite athletes were defined across the literature, they found that almost 70% of the study that used "Athletes highest standard of performance" as the criterion, nearly 70% of the included studies used athletes competing at national/and or international level (Swann et al., 2015, p. 18). Even though there are considerable differences in performance levels for the participants in our study, we can therefore define all of them as "elite athletes."

All athletes used wearable sports tracker devices in their training, and all but one said they used the devices in every workout. To which degree they shared their training data through Strava varied greatly, with some sharing everything, to others sharing nothing. The participants were recruited from the first author's own network. Therefore, many of them are athletes the first author knows personally. This is known as "acquaintance interviews" (Garton & Copland, 2010) and is acceptable in qualitative research (Braun & Clarke, 2013, p. 85). Important to note that you enter into a dual relationship with the person (e.g., a participant and a friend) and that this raises some additional ethical concerns, like that you should not use your pre-existing relationship to pressure someone to partake in the interview, that things revealed in the interview should be confidential if it is something new to the researcher, and that only the audio-recorded data counts as data and not things that the researcher happens to know on beforehand (Braun & Clarke, 2013, p. 87). It is especially important to be careful if the pre-existing relation is hierarchical (e.g., if it was a coach that interviewed athletes). The researcher in the current study is an athlete himself that also qualified for the Norwegian Championship for athletics. Hence, the researcher is an athlete that interviews fellow athletes around the same age and at a similar or a higher performance level than himself.

Therefore, it is, at base, no hierarchical relationship between the researcher and the participants.

Participants were not compensated. Each interview was audio recorded and transcribed verbatim.

Data collection

A semi-structured interview guide consisting of open-ended questions focused on the discussion of how the athletes used their sports watches and their data and how they perceived it influenced them. The interview guide contained a few questions about them as an athlete and as human beings. Questions about how much they used their sports watches, which functions, how much they are monitoring their training volume/intensity, if they are monitoring their speed, and if they use the watch mostly during or after the workout. The interview guide also consisted of questions about whether they posted training publicly, using Strava or similar platforms, and ended with a few questions about mental fatigue and mental restitution.

Before starting the interviews, participants received information about the project and gave their written consent, per the guidelines from NSD. They also consented that data they had shared on Strava could be used as data material.

There are no strict guidelines around sample constitution, sampling size, and sampling strategy for TA, and they should, among other things, be informed by your research question purpose and method of data collection (Braun et al., 2016). Although, it is key to remember that TA is about identifying patterns *across* a dataset; therefore, the sample size needs to be large enough to identify patterns in a meaningful way. Braun et al. (2016, p. 195) suggest six interviews as a minimum sample size for TA. However, just as a general suggestion, it still depends on the particular research questions and designs.

The interviews lasted from 42-70 minutes (Mean time = 61 minutes) for a combined total of 9 h and 6 min interview time.

Data analysis

A reflexive thematic analysis (Braun & Clarke, 2019) was used to identify patterns within the data concerning athletes' experiences with using sports watches. The first author conducted the thematic analysis. An inductive approach to analysis was utilized, with no theory guiding the analysis beforehand. The first author immersed himself in the data, transcribing the interviews, then paraphrasing some of the data to get familiar with what the participants said. Data were then coded manually using the analyzing program MAXQDA. The codes were later divided into themes, and several themes were tried. The final themes were not ready until the manuscript was written. As Braun and Clarke (2022, p. 118) emphasize, the writing of the analysis is not separate from the analysis but an embedded part of it.

Reflexivity and quality criteria

There are many criteria for good qualitative research approaches (e.g., Smith & McGannon, 2018; Tracy, 2010). However, when working from a relativist approach, we see these criteria as not fixed but open-ended and able to change depending on how the research unfolds. Therefore, no predetermined list can measure the quality of the data (Smith & McGannon, 2018). We strived for sincerity by being self-reflexive about subjective values, biases, and inclinations as researchers and by being transparent about our methods (Tracy, 2010, p. 840).

Reflections on positionality

In qualitative research, the researcher's position, including gender, age, personal experiences, beliefs, etc., is relevant (Berger, 2015). Especially important to note in this project is that the first author, who also did the interviewing and data analysis, is an

active distance runner who would have met the inclusion criteria for qualifying for the Norwegian Championship. He has considerable experience with self-tracking training with his watch and using Strava. Using an ontological standpoint of relativism, we see facts as subjective, created, mind-dependent, multiple, and able to change over time (Smith & Sparkes, 2009). We, therefore, assume that the first author's experiences will have influenced how he interpreted the data.

Findings and Discussion

In the current study, four female and five male athletes aged 20-29 years were interviewed. They were competing at Norwegian National Championship or in European Championships. Pseudonyms were given to the athletes to protect their anonymity. The pseudonyms are Lisa, Silje, Eva, Trine, Nils, Martin, Rolf, Frans, and Lars.

In the following section, six themes will be presented and discussed. The themes generated are (1) Feedback from training data reinforces the feeling of competence, (2) The watch controls the training, (3) Avoiding potential negative influences from the watch, (4) Strava, a social factor in training- for good and for evil (5) Strava controls the training, (6) Avoiding potential adverse effects from Strava.

Before presenting the themes, we will briefly present how athletes use their watches. The participants were asked about which functions they used on their watches. Everyone used the GPS function to know how long and how fast they were running. GPS and stopwatch function were the most used, in line with earlier research on competitive runners use of tracking devices (Diotaiuti et al., 2020, p. 60). Most athletes also used the heart rate function, but not in every workout. For most athletes, heart rate was a supplementary tool for intensity control in interval workouts, where lactate measurements were considered more important. Other functions utilized were sleep

quality and quantity, resting heart rate, heart rate during the day, and step count. The athletes did not use all of the watches' functions, like estimated recovery time, training productivity, or performance levels. They did not use those functions because they saw them as unreliable. They were so unreliable that questions about those functions were frequently met with laughter by the participants. Overall, the most prevalent use of sports watches was during training.

The athletes reported that they used the training data from their watches to ensure the quality of the training. For instance, to know that they are running enough kilometers but not too many, to keep the planned intensity, and to make better choices about their training based on biological feedback from their bodies. Many also found it valuable and enjoyable to have statistics and an overview of their training. This study's findings are similar to a survey by Rapp and Tirabeni (2020) that found that amateur athletes used their sports trackers as motivators, while elite athletes saw them as training companions that helped them do their training better.

Regarding Strava, it was considerable differences in how much of their training they were posting there. Only Lars, Trine, and Martin posted all their workouts on Strava. Eva, Rolf, Frans, and Lisa posted some workouts on Strava, and the frequency varied. Silje and Nils did not post anything on Strava. Silje had previously posted all of her workouts on Strava but stopped, while Nils had never used Strava for posting his runs. Therefore, a quote reported by Couture (2021, p. 195) that "If it isn't on Strava, it didn't happen" does not seem relevant to this group.

Interestingly, when checking their Strava profiles, Martin, who reported posting every run on Strava, stopped using Strava shortly after being interviewed for this project and did not post anything for three months.

Feedback from training data reinforces the feeling of competence

A critical finding from the current study is that athletes' watches continuously gave the athletes feedback on their performance. To see "good" numbers (i.e., high speed, low heart rate) gave them a positive feeling, which can be linked to a feeling of competence, whereas to see "poor" numbers gave a negative feeling or a feeling of lower competence. This way, training data from the watches can amplify how well their training is going. Nils puts it this way:

It is motivating to see good splits and low heart rate; it is a positive spiral. It makes you smile and makes you perform even better. On the other hand, it may also contribute to a negative spiral. When you run and feel a little heavy, then you look at the watch and see: "oh shit, I really am heavy," and then you feel even worse (Nils)

This quote captures this theme very well. Good feedback from training data makes a good feeling, while bad feedback makes a bad feeling. Although, this does not come only from sports watches. Lisa mentioned the measurable nature of athletics similarly:

It's kind of both the best and the worst with athletics that it is so measurable. When you run the same interval workout every week, all year round, you can clearly see how you are doing. It is kind of like a competition, in a way, when you see at every workout that "today I ran that much faster than last week" or "today I ran slowly" (Lisa)

The measurable nature of this sport is nothing new, but the GPS provides precise calculations regarding distance and speed (Cummins et al., 2013; Pobiruchin et al., 2017), which gives opportunities for measurable data from every run, not just the ones where you run standardized ones. Hence, you can get feedback on how well you perform more often and get it displayed on the watch in real-time.

Not every athlete seemed to be as negatively influenced by getting poor feedback from their watches as others. Several of the athletes stated that they had been more concerned with feedback on how well they did in training earlier in their careers, but with more experience, they did not let it bother them as much. Some athletes that seemed less influenced by their watches had been doing well in competitions lately. For example, Frans gave an overall impression that the feedback he got from his watch did not influence him very much. He was interviewed shortly after some of the best races in his career. At the end of the interview, he reflected on how the confidence he had gained from recent races could have affected how he answered questions about the topic.

Another aspect of modern sports watches is that the embedded GPS allows you to easily see how many kilometers you have run, in a single workout or over a period, like a week. Some participants reported motivation from seeing statistics of the training they had completed. For example, Nils stated that it feels good to see that you accumulate a lot of kilometers and that it feels like collecting points. This is an aspect that also Silje spoke about: "It is as a motivational factor in itself to know how much you have run or trained, or if you have done those strength workouts, that you have had a good training week."

The current study findings are similar to an earlier qualitative study that investigated self-tracking tracking among amateur endurance athletes (Mopas & Huybregts, 2020). Participants described feelings of happiness, gratification, and joy after running a personal best or seeing an increase in their average pace. However, seeing that they could not meet their expectations felt demoralizing (Mopas & Huybregts, 2020, p. 31). Seen through the lens of SDT, we can tie this to the need for competence which refers to our basic need to feel effectiveness and mastery (Ryan &

Deci, 2017, p. 11). The athletes feel more intrinsically motivated when they get feedback that they are doing well.

Conversely, they may feel less intrinsically motivated when they get feedback that they are not doing well. As Ryan and Deci (2017, p. 156) point out, people may lose intrinsic motivation when their competence is devaluated. The positive feeling the athletes get when they see that they are getting better can be explained by the basic need for competence that can be satisfied by extending skills and expertise (Vansteenkiste et al., 2020, p. 3).

Some athletes that seemed less concerned with the numbers on their watch had been doing well in competition lately. Competition is arguably the most crucial place to get competence feedback for competitive athletes. Therefore, they may be less concerned with how well they do in training when their latest competitions have gone well. That some athletes also reported that they were more concerned about how well they performed in training earlier in their careers may be tied to the fact that more experience makes them know that there are good and bad days. It has earlier been suggested that when people know how they can improve, negative feedback can be less detrimental (Hu et al., 2016). In addition, previous experiences are the most essential for self-efficacy (Bandura, 1977); therefore, if athletes have previously been successful in coming back from a difficult period, they are more likely to believe they can come back from difficult periods again.

Reports from the athletes about feeling motivated from seeing statistics of the completed training suggest that high-level athletes get motivated from tracking activity, which is in line with the earlier research findings (Butryn et al., 2016; Etkin, 2016; Pettinico & Milne, 2017). However, in the study by Etkin (2016), they found that tracking led to reduced enjoyment of the activity they were tracking and made it feel

more "work-like." The current study's data material showed no clear indicators that these athletes suffered from this. Suppose we see this in light of CET (Ryan & Deci, 2000a). In that case, it could be because the participants in Etkin's (2016) study saw tracking as controlling their behavior and thus undermined their autonomy, while participants in this study did not see tracking as controlling. We may tie this to the fact that these athletes train to do well in competitions, which is an extrinsic factor (Weiss & Ferrer-Caja, 2002). Therefore their training is likely already, to some degree, "work-like.". New technology for tracking makes it easier for athletes, that have been encouraged to keep track of their performance and activities for decades (Hopkins, 1991, p. 162; Pettinico & Milne, 2017, p. 282). Although, since you can track so much more with modern technology, it may be that some aspects of training have got a more controlling element, as we shall see in the next theme.

The watch controls the training.

As noted, feedback from training data may reinforce the athletes` perceptions of how well they are doing. This theme describes how this feedback may influence athletes to train in such a way that they feel good about their training. The data from the watches seem to give them some standards for how fast or long they should run. One question was: "Had you trained differently without the watch, Nils?"

That is a good question. I have thought about it many times. How fast would you have run on your easy runs if you had not had the watch and not seen those numbers? And how long would you run?[...] I think it has an influence; you set some standards for yourself and use your watch to see if you perform to those standards. It makes the body become like a machine, in a way. (Nils)

Something that Nils uses as a standard is to run his easy runs at a pace of "sub 4" (minutes per kilometer). He finds this ironic: "And why exactly sub 4?" [laughs] The body is not like that, right? That is just something we have made up" (Nils).

Nils highlights an interesting aspect: every kind of limit regarding time, distance, and pace is just made up. Because, after all, why is a kilometer a kilometer? Why is a minute a minute? As Nils points out, it is something we have made up. Nevertheless, as these data suggest, it may influence how the feedback from the training data is perceived. As Lisa pointed out (see the previous theme), athletics is a very measurable sport, and you frequently get feedback on how well you are doing. The standards set for yourself may influence what is seen as a good or bad pace. Rolf did not have a watch with a GPS function when he first started running and reflects on the differences between using GPS and not:

Back then, I just ran and wrote in my training diary where I ran and for how long. Then I steered the training more by my feeling than by speed. I think I am still steering the run by feeling, but now I also steer by pace. You compare yourself to your standards, and you always want to be better than you were before (Rolf)

Rolf steers the intensity of his runs by pace in almost every run. He may increase the speed during an easy run if he looks at the watch and sees that it is slower than planned. He also steers interval workouts by speed, which occasionally has been a mistake. He had lately been running a standard interval workout at a speed of 3:10 per kilometer, and he used his watch to steer himself to keep that pace instead of steering by feel. When he measured his blood lactate, it indicated that he was in worse shape than he had been recently, which made him frustrated. Important to note here is that Rolf also compared himself to his standards before he used a watch with GPS function. Then he

often ran standard routes that he knew the distance and therefore knew how fast his average pace was. The considerable difference is that he did not know it during the run and would adjust the intensity by feel, not by the number on his watch.

Some athletes also reported that they had to run a few hundred extra meters to end the workout on a round number (e.g., 10,0 km). This finding can be tied to seeing statistics about the training they have done felt motivating. If you use the number of kilometers as a framework, this number may influence how a "good workout" or a "good training week" is perceived.

Almost all the athletes used their watches in every workout. However, some of them had experienced not being able to use it because of empty batteries, not finding it etc. Not being able to use the watch was often perceived as unpleasant because they would not know how fast or how long they ran and thus not know if they met their training standards. As Nils stated: "You almost feel like you did not run those kilometers if they are not visible anywhere. It messes up the weekly kilometer amount". He likes to have the data from the runs, which other athletes also reported.

Not all athletes were as concerned with being unable to track the workout with their watch. Some said it was not a big problem on easy runs but a more significant problem on intervals. For some, it could even be liberating, like for Eva, who several times had experienced that her watch ran out of battery during runs. She found it stressful on harder runs because she had specific goals for the pace and distance. However, when experiencing the same during an easy run where she did not have any particular goal about how fast she should run, it felt liberating not to feel the need to look at the watch all the time.

That many athletes find it stressful not to be able to wear the watch indicates that this tool is very important for these athletes. An earlier study in non-sport settings found

that people became less motivated to be active if they could not track their activity (Attig & Franke, 2019). The statement, "you almost feel like you did not run those kilometers if they are not visible anywhere" (Frank), indicates that this, to some degree, may also happen to elite athletes. They have goals, and they need to be able to monitor their run to get information about the result. They like to chart and visualize their process; something also found in earlier research (Mopas & Huybregts, 2020). Participants in the study by Mopas and Huybregts (2020, p. 34) also felt that the workout almost did not count if they could not track it, much in accordance with the statement made by Nils here. Looking back to the previous theme, athletes found the data from the watch motivating when they did well. When they control themselves to reach the standards they set for themselves, it can be positive for intrinsic motivation if they match those standards. However, in Eva's case, not being able to use the watch felt liberating when she did not have any specific goal for the pace. The watch may have induced a controlling factor on runs where she just wanted to run easy and not think about her speed.

Avoiding potential negative influences from the watch

The athletes were conscious of some aspects discussed in the previous two themes. Martin was an athlete that reported being conscious about not letting his watch lead him to run too hard on his easy runs. As he said:

I may look at the pace during a run, just out of curiosity, but I am very conscious that easy runs should not feel too hard. Therefore I do not stress about running fast enough to obtain any specific average pace (Martin).

Martin indicates that he is able not to let his watch influence his intensity on easy runs by being conscious about it. However, this may be hard to do. Therefore some of the athletes reported that they had turned off functions of the watch they thought could

influence their training more than it helped them. For example, Nils had turned off the function that shows his average pace during a workout. This should stop him from getting tempted to run faster towards the end of a run to get a better average pace (e.g., to get an average speed of sub 4 min/km). Lisa, who also tried not to look too much at her watch during an easy run, found it helpful to turn off the autolap function of the watch that beeps and shows the time for every kilometer. However, she still found it difficult not to be influenced by her watch when running flat routes, especially routes she ran often. A strategy that made it easier for her to not care about her pace was to run in the forest:

I very much like to run in the forest. There, I have no idea how fast I should run because I know it will be slower there, and I do not look at my watch. I am just running (Lisa)

As mentioned earlier, athletes often have standards for themselves, like running under a specific time limit per kilometer, which can control the training. Lisa eliminates this factor by running places where these standards do not apply. Silje reported another strategy for eliminating the controlling factor of the watch. She often tried not to look at her watch during easy runs, and sometimes she took her watch off. She was especially conscious of not looking too much at her watch during periods when she was not in her best shape. Although she usually wore her watch because she considered it helpful, she did not look very much at it during easy runs. On interval workouts, however, she looked at it actively during intervals, where she steered intensity by heart rate. Silje was the only one of the athletes that reported sometimes not wearing the watch. Some did not consider that option because they perceived it as more important to track their training. For example, Nils found it essential to track all the training with his watch because he did not write any additional training log and wanted to have the training

saved on his watch. Silje, on the other hand, wrote a training diary, which may have made her less reliant on tracking every run with her watch.

As we have previously seen, negative feedback can devalue athletes' perceived competence (Ryan & Deci, 2017). However, the techniques reported here reduce the amount of input from the watches, making them less likely to feel that their competence is devalued. Hence, they do not feel pressured to reach specific standards in their workouts. Distancing from self-tracking data has also been reported earlier. A study by Esmonde (2020) examined female recreational runners who identified themselves as self-tracking. In this study, some participants chose not to track every run because they just wanted to go out and enjoy the run without worrying about pace (Esmonde, 2020, p. 83). They did this in runs where they did not see it as essential to track because they did not have any specific goals about the pace. Even though the participants in our current study are elite and, therefore, likely to be more serious about their training than the participants in Esmonde's (2020) study, they share tactics about distancing themselves from tracking and meeting specific standards in every run.

Strava, a social aspect in training – for good and for evil

Strava is a social network where you can post your training and see other people's workouts, and give them "kudos" (equivalent to Facebook's "likes") or comments (Strava, 2020). Using Strava can be inspiring and fun but also have adverse effects. In the first presented theme, we found that the watch could feel positive when training was going but negative when it was not going very well. This seems to also be the case with Strava, with an additional social aspect.

Scrolling through Strava to see what training others have done was something several athletes valued and did for fun and inspiration. They could be following both other runners and athletes from other sports. For example, Martin had a strong interest

in the training behind good results and used Strava to see how others trained and to show others his training. He wished to see more athletes on higher levels do the same because "Seeing the process behind the results is more interesting than the results itself" (Lars). Frans also indicated an interest in what other athletes did in training and especially liked following those who posted everything on Strava (which he did not do himself). Seeing other athletes that train well could be inspiring and motivating and make the athletes want to do an excellent job in training for themselves. Like Rolf said, "If you see competitors train well, you think you must train well yourself.". In addition, Lars stated that he liked the milieu on Strava, where he perceived that people were supporting each other's progress and cheered on each other.

That you can get "kudos" from other Strava users on your activities is something that can feel satisfying. Like Martin said: "On the workouts where I have trained well, it is satisfying to see others give kudos on it." Martin also indicated that he could think about how the workout would look on Strava when he felt he had done well in training.

Like with the watches, Strava also seems to amplify how athletes perceive their training. A statement from Trine captures this well; she was asked how she was mentally influenced by her watch and by Strava:

You can get pretty high confidence! If you have had an excellent workout, it looks good on Strava. If you feel in good shape and get many kudos [laughs], then it is fun. When it goes bad, however, it is not so much fun. Then I may think; "what do people think when they see this (Trine)

Trine was not the only athlete that felt good about posting good workouts on Strava but bad about posting bad workouts. For example, Silje used Strava for a while but later stopped using it. When she started running, she did not have many expectations of herself and found Strava to be good fun. However, when she became a better runner and

got more expectations for herself, she felt it had more of a negative influence during periods where she did not do so well:

Maybe I tried, to some degree, to perform to make it look good on Strava and for competitors. I wanted people to see that I trained well and was in a good place. And also, if I had a bad day and looked at someone else's workout and `wow, they are in good form,` it became twice as bad. (Silje)

Other athletes also perceived Strava as more positive during good than bad periods. On a question about how often she checked Strava, Lisa said:

It very much depends on if it is a good period or a bad period. If I am sick or injured, or things just don't go very well, I don't like to check Strava because I get stressed seeing others train well. But when you have a good period, and it goes well in training, I can be on there [on Strava] when one stops by [laughter] Instagram, Facebook, and Strava. Then it is one of those apps. (Lisa)

Lisa did not post every workout on Strava; she just posted a few workouts when she felt like it. She said she could add a more detailed description of exercises she was delighted with. Rolf also posted only a few workouts on Strava, and he and Lisa both mentioned that they could be selective about what they posted. In addition, they were both conscious that others might be selective too, which could make Strava contain more good workouts than bad ones. As Rolf said: "you are maybe just uploading the good workouts, and not the bad workouts, or not when it goes bad."

Strava may, for many athletes, be a positive addition to their daily life and daily training because it is inherently enjoyable or exciting, which is the definition of intrinsic motivation (Deci & Ryan, 2000). It may also be a positive facilitator for intrinsic motivation in training because you can get positive feedback, in the form of kudos or comments, from those who see your training data. Although, if they are having a bad

training period, it may feel negative. Again, we can tie this to getting feedback on your competence. When it is not going well, seeing do well can be a reminder that it is not going too well and thus undermines intrinsic motivation. As Deci and Ryan (1985) suggested, publicly delivered feedback may decrease intrinsic motivation because of larger perceived external pressure. Here, training data not only gives athletes feedback about how well they are doing, but they also know that others can see it. As Ryan and Deci (2017, p. 130) specify, there is both an informational and a controlling aspect of external events relevant to regulating behavior. The informational aspect conveys information about competence, while the controlling aspect pressures people to think, feel or behave in particular ways and may thus diminish intrinsic motivation. The statements made by Trine and Silje here indicate that sharing their training data with others controls them to think and act in a specific way. As Ryan and Deci (2017, p. 160) suggest, environments that support people's basic psychological needs for competence, autonomy, and relatedness are most facilitating towards intrinsic motivation. These statements, especially the ones made by Silje, seem to devalue both competence and autonomy. On the other hand, a basic tenet of CET is that positive feedback will likely enhance intrinsic motivation in contexts where people experience some level of autonomy (Ryan & Deci, 2017, p. 485). Therefore, using Strava when you feel you are doing well makes you able to show others that you are doing well, which gives more positive feedback. This may explain why athletes want to share their workouts on Strava, and as some of the athletes implied, you especially want to show others the workouts you are satisfied with. This also relates to the study by Couture (2021), where recreational athletes that used Strava felt terrific showing people workouts they were satisfied with. Further, they were motivated to see others do their training, but some

could feel worse when they saw others do exercises they were not capable of themselves. Findings in this theme suggest that elite athletes are no different.

Ryan and Deci (2000) specify that it is not the external events per se that influence intrinsic motivation but how the individual interprets them. When posting training data on Strava, the athletes know that others will see this data, which makes them feel observed. Whether people are influenced by someone observing them may be affected by whether they feel evaluated. Enzle and Anderson (1993) found that if an observer is seen as just a curious onlooker, the person observed will not feel evaluated. However, if the observer is believed to evaluate the performance, he can control the behavior of the person observed. The above statements from the athletes indicate that they feel that those who see their activities on Strava will evaluate them. This may be why people may try to look their best on Strava, and if they do not post every workout on Strava, they may, as Rolf mentioned, choose to post only when the training has gone well. It has earlier been reported that people on social media share mainly positive characteristics and life events (Zhao et al., 2008). This may also be the case with Strava, where you may primarily want to share the training that goes well. Important to note here is that Strava is not the only source of comparison. Athletes may be talking together or training together and comparing themselves to one another without using Strava. This aspect is, like self-tracking of training, nothing new. What is new is that you have even more opportunities to compare yourself to others. Comparison is in itself not bad, and we can argue this is a natural effect of competitive sports. However, when you do not feel like you are doing well and the need for competence is not satisfied in training, Strava can remind you of this, making it worse. Contrary, when things are going well, there may be a positive motivational effect of showing others that you are doing well.

The findings that athletes liked seeing others do their training, and especially Lars's statement about there being a milieu on Strava where people support each other, relate to SDT's basic need for relatedness. Strava and other social sports apps have earlier been found to be able to satisfy the need for relatedness (Bitrián et al., 2020), something especially Lars's statement about enjoying the milieu on Strava supports. Researchers have suggested that the need for relatedness on social media can stem from sharing information with others and joining a community to interact with people with shared interests (Kim & Drumwright, 2016, p. 970). In addition, social factors like social approval and affection and the potential to influence others have also been seen as essential factors for relatedness on social media (Gangadharbatla, 2008, p. 8).

Strava controls the training

Several of the participants in our study that posted their training data on Strava implied that they were often aware that people would see their workout afterward, regarding distance, duration, and pace. This may have implications for which choices athletes make regarding training. As we shall see, knowing that other people will see their training data can make it harder to shorten or skip a workout if needed, make you run faster, and influence which route you will run. An example of this was Trine, who sometimes felt the thought that her workout was going to be posted on Strava made it harder for her to adjust her training if needed:

If you run an easy run and the plan says sixty minutes, but you feel bad. Then maybe it would be a good idea to shorten the workout and only run for like 15 minutes. But then I think: "How does this look on Strava" [laughter], and you end up running for at least 45 minutes (Trine)

Trine was not the only one that implicated that this was influencing her. Silje, who admitted sometimes training "for Strava" (see the previous theme), also spoke about how Strava could make her train more than she should: "Maybe I trained at days I should have rested, and maybe I trained two workouts on days I should have done only one" (Silje). She also admitted sometimes to run faster than optimal on easy runs because she wanted her average pace to look decent on Strava, something also shared by other athletes. Ensuring a high average pace could also influence athletes' choice of training terrain. Rolf was asked if he could run flat courses to ensure that he could maintain a certain speed on easy runs and elaborated this way:

I have sometimes chosen to run courses that I know are fast because I have decided to run 4:00-4:10-4:20 per kilometer. I have done that for a while and maybe let Strava influence me. If people are used to seeing me run an average pace of 4:10 per kilometer, then that is the pace I should run. But in the last year, I have become much better at not caring about that and running in different terrain. I think it was not a good idea to train as I did, and maybe I lost out on some other types of training, like running hills, when I just ran the same flat routes all the time. (Rolf)

To run in flat terrain to ensure a high average pace was something some of them said they could sometimes do; some said they had done that earlier in their career but stopped, while others did not care about that.

As the previous theme notes, getting kudos on your workouts can feel satisfying. Rolf reflected a little that he got more likes on workouts that were especially good or different from normal ones. He says this about it:

I think uploading workouts on Strava may make you run a little faster than you should, and you may only upload the good workouts, and not the bad workouts,

or not when it goes bad. Therefore, I think it will influence the training in different ways. (Rolf)

Seen in the light of CET (Ryan & Deci, 2000a, 2017), getting feedback from others can be both informational and controlling. In this context, others will not necessarily directly give feedback, but there may be a feeling that those who see the workout on Strava will evaluate it. Strava users can also give kudos or comment on exercises (Strava, 2022), which can work as feedback. As Plant and Ryan (1985) argue, when people are aware of themselves as if through the eyes of another, it puts people in an evaluative stance toward themselves, which has a controlling functional significance. Trine implied that she is motivated to avoid the shame of running a very short workout and can thus be said to be motivated by what in SDT is called an introjected regulation, a regulation to avoid guilt or attain pride (Ryan & Deci, 2000a). This type of regulation can make athletes control themselves because others will see their training data, making it harder to adjust training if needed, something especially the statements by Trine and Silje indicates. Introjected regulation is thought to have a detrimental effect on individuals because it can lead to effortful self-control without feeling autonomy (Ryan & Deci, 2017). Motivational costs of introjected regulation, such as low need satisfaction and high negative effect, have been reported (Standage et al., 2005). It has also been found that elite athletes with a strong introjected regulation were more likely to experience burnout over a 4-month period than those with other strong regulatory styles (Lonsdale & Hodge, 2011).

Avoiding potential adverse effects from Strava

Some of the athletes were conscious that posting their training on Strava could have different consequences for their training. As a result, they often had strategies to avoid this practice's potential adverse effects. These strategies could include limiting

how often they checked Strava, limiting how often they posted their workouts on Strava or cutting Strava out completely. The athletes also elaborated on why they used these strategies. For example, Martin uses Strava and often likes to see others do good workouts, which can inspire him to train well for himself. But at the same time, he is conscious that it can be hard to see a lot of good training:

I am conscious that people often publish the best they can, and the sum of that is that it is a social media that is quite powerful in terms of many good workouts in one place. (Martin)

He further elaborates that he may feel a little frightened of seeing people apparently in terrific shape, which can make him lose motivation. Therefore he limits how often he uses Strava and avoids using the app every day. Limiting how often you check Strava was also a technique used by other athletes. For example by Trine, who was injured at the time of the interview:

I have felt that it has not been positive for me to be on there [on Strava] to see what others have done when I'm out of training, but maybe I am there a little more when I post training myself (Trine)

Her statement relates to the point that whether Strava feels positive or negative depends on how well the training goes. Trine is here in a bad period, and Strava reminds her that she is in a bad period. Rolf is an athlete who posted everything on Strava but now only posts sporadically and reflects on why in this way:

I started to reflect on why I posted absolutely everything. Was it because it should look good, and did it make me run faster than I should? I started to think that I don't need this for anyone but myself (Rolf)

This statement indicates that he is concerned about whether Strava influences him to think about how his training is perceived and therefore chooses to post less of his training.

Nils does not use Strava at all. One of the reasons for this was that he did not want everyone to see what he was training, both because of tactical reasons towards competitors and because of a concern of young athletes copying his training without knowledge or ability to do so. In addition, he comes back to the point noted earlier about the standards he sets for himself:

If I posted on Strava, I would maybe have been even more concerned with those numbers, like being `sub 4` and in heart rate. Because then I know that people are going to look at it. [pause] Also, if you have a bad day, you don't want to [pause].

I don't know; you want to keep some secrets from your competitors. (Nils)

He here indicates that he does not want his competitors to see his bad workouts.

Therefore, he avoids thinking about what people think about his exercise by not posting it.

We can tie these findings to the need for competence in SDT (Deci & Ryan, 2000). Trine does not like seeing others doing well when she does not do well. Athletes may also, like Nils implies, avoid sharing training on Strava, so competitors will not know if they have bad training days. As we saw in the previous theme, some athletes run faster or longer than they maybe should on bad days because they know others will see their workouts. Keeping your training data private may be a good tactic to avoid being influenced by this.

General Discussion

When shared on Strava and not, self-tracked training data seems to be a factor that enhances athletes' intrinsic motivation when the data gives them feedback that they

are doing well. However, it could sometimes also diminish intrinsic motivation when the data gives them feedback that they are not doing well. In light of SDT (Ryan & Deci, 2000a), we can link this to the need for competence. Therefore, to do well and have training data from the watches telling them they are doing well enhances the feeling of competence. On the other hand, if they are doing poorly and get poor feedback from training data, it may have the opposite effect. It has been suggested that the competence need is vital in sports because of its competitive nature, which gives many opportunities to measure competence (Reinboth et al., 2004). Therefore, self-tracking and sharing of training data provide even more opportunities to measure competence. Given the presented data, these opportunities to measure competence can have implications for everyday training by giving the athletes specific standards to reach in their exercises. These standards include pace, duration, or distance. When athletes say they use feedback from their watches to make better choices about adjusting their training, the standards they set for themselves seem to be a factor that, in many cases, works against its purpose. It can induce a controlling factor that makes it harder to adjust the training when needed. When athletes share their training data on Strava, this effect may be even more substantial because there is a social aspect in the picture. Our findings suggested that some athletes that posted their training on Strava were motivated out of what in SDT is described as an introjected regulation, which is a regulation where the individual is motivated to avoid guilt or attain pride (Deci & Ryan, 2000). They were aware of how their followers would perceive them on Strava, which could make it harder to adjust the training if needed.

There may be individual differences in how much self-tracking and sharing of training data influence athletes. For example, an impression from the data material was that the athletes that had been doing well in their latest competitions were less

concerned with getting negative feedback from their training data. This may be explained by the fact that competition is likely to be the most crucial place to get competence feedback for competitive athletes. Hence, when they feel they do well in competition, this feedback outperforms poor feedback from their watches. However, athletes who do well in competition are most likely in good shape and may therefore get more positive feedback from the training data during the periods when they do well in competitions. Some athletes also said they were more concerned with bad feedback in training earlier in their careers. This suggests that with more experience, they know that some periods will be worse than others. Moreover, studies have shown that negative feedback is less detrimental when people know how to improve (Hu et al., 2016). More experience with improving their performance after periods of performing badly may make athletes feel they know how they can improve, making negative feedback less detrimental.

Practical implications

Given the results presented, it is likely that to self-track with sports watches and share training data on the social network Strava impacts how athletes train through motivational effects. For example, self-tracking gives athletes specific standards to reach in their training, making them train more or run faster on their runs. Coaches and athletes may need to be aware of these effects and consider whether it is a problem. An example of this can be a runner that wants to run sub four minutes (or any other kind of limit) per kilometer on easy runs – will it induce a risk of training too hard, or will it be positive to run fast enough in training? If it is seen as a problem that the watch controls the running speed, techniques that can be learned from athletes in this study are running places where you have no idea about what is fast or slow or simply not looking at the watch.

Sharing training data on the social network Strava can be enjoyable and inspiring. However, it can also make it harder to adjust the training if needed because the athletes know that others will see their training data. Therefore, athletes should consider their amount of Strava usage based on whether this social network is a positive addition to their daily training and daily life or has adverse effects.

Limitations

This article provides an overview of how high-level athletes' motivation can be influenced by monitoring training with sports watches and sharing training via Strava. However, there are many personal differences, like gender and personality types, that this article does not consider.

Another limitation is that we use only watches and apps when investigating the motivational aspects of self-tracking. Most (all but one) of the athletes also relied on lactate measurements to control the intensity of interval workouts and relied more on this than on the data their watches could give them. Lactate measurement can also give competence information and could therefore have been interesting to explore.

Conclusion

Self-tracking with modern sports watches and sharing of training data on a social network seems to have consequences for athletes' motivation, which, in turn, influences their training. These consequences may be both positive and negative and are, to a significant degree, tied to SDT's (Deci & Ryan, 2000) need for competence, which can be either supported or thwarted by training data. Further, athletes are aware of some of the adverse effects of self-tracking and use strategies to avoid them.

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Forord

Som masterstudent i idrettspsykologi og aktiv langdistanseløpar begynte eg å reflektere over dei psykologiske effektene av å monitorere trening med moderne treningsklokker. Når eg skulle velje masteroppgåve var derfor dette temaet midt i blinken. Eg er glad for å ha fått brukt det siste året til å fordjupe meg i eit interessant tema. Eg føler dette arbeidet har gitt meg djup innsikt i både korleis monitoring av trening kan påverke motivasjon og meir innsikt i kompleksiteten ved motivasjon. Eg set også pris på erfaringane ved å ha gjennomført eit forskningsprosjekt.

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Norsk samandrag

I denne studien har vi undersøkt korleis sjølvmonitorering med moderne sportsklokker og deling av treningsdata via det sosiale nettverket Strava psykologisk påverkar Norske mellom- og langdistanseløparar på elitenivå, og om dette har implikasjonar for korleis dei trenar. Vi anvendte kvalitativ forskningsmetode, ved bruk av semi-strukturerte intervju og analyserte data ved hjelp av Braun og Clarke (2022) sin metode for Refleksiv tematisk analyse. Resultata vart diskutert i lys av Sjølvbestemmelsesteorien (SDT; Ryan & Deci, 2000). Funna våre tydar på at å monitorere trening med moderne sportsklokker gir utøvarar meir hyppige tilbakemeldingar på kor bra dei gjer det, og at det kan påverke motivasjonen både positivt og negativt. Vidare tillett monitoreringa at utøvarane kan sjå kor godt dei presterer i forhold til dei standardane dei set for seg sjølv, som går på fart, distanse og varigheit på øktene, og desse standardane har implikasjonar for korleis dei trenar. Deling av treningsdata på det sosiale netterket Strava kan vere morosamt og inspirerende, men at andre kan sjå korleis ein trenar kan også gjere at det blir ein kontrollerande faktor, som gjer det vanskelegare å justere treninga når det trengs. Utøvarar kan vere bevisste på at det både kan vere positive og negative effekter av monitorering, og fleire rapporterte strategiar for å unngå nokre av dei negative konsekvensane.

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The theoretical framework for our article: Self-Determination Theory

In the following, we aim to give a more in-depth explanation of the theoretical framework we used to discuss our results in the article.

SDT is a multidimensional theory of human motivation that manifests itself in that human beings want to satisfy three basic needs: autonomy, competence, and relatedness (Deci & Ryan, 2000). These basic needs can either be satisfied or frustrated by need-supportive or need-thwarting contexts. When these three psychological needs are satisfied, people experience physical and mental wellness, proactivity, and positive development (Standage & Ryan, 2020, p. 38). Satisfying basic needs supports many outcomes related to hedonia (feeling good) and eudaimonia (functioning well). On the other hand, need thwarting contributes to poorly

integrated motivation, ill-being, and non-optimal functioning (Ryan & Deci, 2017; Vansteenkiste et al., 2020; Vansteenkiste & Ryan, 2013). Empirical work has shown that psychological need satisfaction can predict numerous adaptive outcomes in sports and exercise settings, which include autonomous motivation and positive affect. Reinboth et al. (2004) suggested that in sports, competence is more salient than the two other basic needs. This is because of the sport's competitive nature, with many opportunities to measure competence. The competence need concerns experiences of effectiveness and mastery and can be satisfied when using and extending skills and abilities (Vansteenkiste et al., 2020, p. 3).

The participants in our current study are competitive athletes who train to do well in competition. Theoretically, competition is thought to decrease intrinsic motivation, as it is, by definition, an extrinsic factor (Weiss & Ferrer-Caja, 2002). However, competition can measure competence. Reeve and Deci (1996) found that winning competitions can enhance intrinsic motivation through increased perceptions of competence. Blanchard et al. (2007) found that they did not necessarily have to win to experience intrinsic motivation, but if they felt they were doing well, the need for competence was supported. Athletics is a sport where competence is easily measured in a very objective manner. How fast you run is how good you are, the result lists show no mercy.

People can have different amounts of motivation and different kinds of motivation. That means they vary not only in the level of motivation but also in the *orientation* of motivation (Deci & Ryan, 2000, p. 54). At the most basic, there is a distinction between extrinsic and intrinsic motivation. Extrinsic motivation means that the individual is doing something because it leads to an outcome outside the activity itself. Intrinsic motivation is that the individual is doing an activity for the activity's own sake – that it is inherently interesting or enjoyable rather than to achieve some separable outcome (Ryan & Deci, 2000, p. 56). Research has shown that quality and experience can vary depending on whether one behaves for intrinsic or extrinsic reasons, and intrinsic motivation can predict higher learning, well-being, and psychosocial

functioning (Cerasoli et al., 2014; Ryan & Deci, 2000). SDT also distinguishes different kinds of extrinsic motivation, which is differentiated by whether the individual feels that it is internal or external to the self. An extrinsically motivated activity can be motivated by external factors, for example, to avoid punishment, or internal factors, to obtain some outcome that is important to oneself (Ryan & Deci, 2000).

Cognitive Evaluation Theory (CET)

Cognitive evaluation theory (CET) was presented to specify which factors lead to intrinsic motivation variability (Ryan & Deci, 2000, p. 58). In broad outline, they in this theory argue that events that are perceived to negatively impact a person's experience of autonomy or competence will diminish intrinsic motivation. In contrast, factors that support the experiences of autonomy and competence will enhance intrinsic motivation (Ryan et al., 2009, p. 110).

Research on intrinsic motivation has emphasized the conditions that enhance, elicit, or sustain this type of motivation versus those that undermine it. SDT is explicitly framed regarding social and environmental factors that facilitate versus undermine intrinsic motivation (Ryan & Deci, 2000, p. 58). However, in SDT, motivation is seen as a property of the living organism.

Therefore it is believed that the environment does not cause motivation in itself but can either nurture or diminish it (Ryan & Deci, 2007, p. 4). In CET, it is argued that interpersonal events and structures, such as feedback, rewards, or communications, can enhance intrinsic motivation because they satisfy the basic need for competence (Ryan & Deci, 2000, p. 58). Further, CET specifies that feelings of competence must be accompanied by *a sense of autonomy* to enhance intrinsic motivation. This means that to experience intrinsic motivation; people must not only perceive that they are competent but also that their behavior is self-determined.

Both autonomy and competence are experiences that are readily affected by the social environment they are in. For example, a sport may be perceived as interesting, but a controlling coach who pressures and orders his athletes can diminish a person's interest or the joy of the engagement (Ryan et al., 2009, p. 110). Important to note is that one of the foundations of CET

is that the effects of events on intrinsic motivation depend on how the individual interprets the events. It is not the external events per se but their psychological meaning to individuals that determines their effects on intrinsic motivation (Ryan & Deci, 2017, p. 159). For example, if the individual thinks that an observer is evaluative of their performance, it may feel controlling, thus undermining autonomy. However, if the same observer is just seen as a curious onlooker who does not care about the performance, they will not be perceived as controlling and thus not undermine autonomy (Enzle & Anderson, 1993).

Ryan & Deci (2017, p. 130) discusses three aspects of external events relevant to initiating and regulating behavior. First, the informational aspect, which conveys information about self-determined competence, facilitates perceived competence and an internal perceived locus of causality (PLOC), supporting intrinsic motivation. Second, the controlling aspect, which pressures people to behave, think, or feel in specific ways, facilitates an external PLOC which diminishes intrinsic motivation. Third, the amotivating aspect, which intends incompetence to obtain outcomes and/or lack of value, will undermine both intrinsic and extrinsic motivation and promote amotivation. The impacts of rewards, feedback, or other external events on intrinsic motivation will depend on the psychological meaning for the individual (Ryan & Deci, 2017, p. 130). For example, if a reward is seen as something that will make a person do an activity, the reward is likely to be controlling and thus undermine intrinsic motivation. On the other hand, a reward by the person who receives it is seen as acknowledging a job well done; it is more likely to be experienced as informational and thus sustain or enhance intrinsic motivation (Ryan & Deci, 2017, p. 130).

From the perspective of SDT, intrinsic motivation is a *growth* function manifested in circumstances in which people can exercise and stretch existing skills or capacity (Ryan & Deci, 2017, p. 152). The most exhilarating feeling comes from exercising and enhancing skills or abilities because it gives a strong feeling of competence. Positive feelings from demonstrating overlearned mastery are not intrinsic satisfactions but typically extrinsic

satisfactions associated with impressing others or receiving rewards. When people are intrinsically motivated, they will tend to seek optimal challenges, and the feeling of competence when volitionally seeking such tasks sustains intrinsic motivation over time (Ryan & Deci, 2017, p. 153). The seeking of optimal challenges is an effect of intrinsic motivation that makes it advantageous to enhance skills over time.

The Role of Feedback

Feedback is important in CET because it gives information regarding perceived competence. When people engage in activities that provide opportunities for mastery, it is expected that positive feedback will typically enhance their intrinsic motivation (Ryan & Deci, 2017, p. 153). Research has indicated that this seems to be because the need for competence is supported when positive feedback is received (Vallerand & Reid, 1984; Vansteenkiste & Deci, 2003).

It is a distinction between spontaneous, *task-inherent* feedback, which is feedback from the task itself, and external sources of feedback, which can come from other people. The task inherent or naturally occurring positive feedback is likely to be experienced as informational rather than controlling. On the other hand, positive feedback mediated through others can be, depending on how it is administered, either informational or controlling (Ryan & Deci, 2017, p. 155). This is important to note in this project - the sports watch can be said to be a type of task-inherent feedback because it is, first and foremost, a tool that measures how an athlete is doing on the task itself. Strava, on the other hand, is a social network where feedback also can come from others.

When it comes to negative feedback, research has, not surprisingly, indicated that negative performance feedback tends to decrease intrinsic motivation relative to both positive feedback and no feedback (Ryan & Deci, 2017, p. 156). People tend to lose intrinsic motivation when their competence is devaluated, either explicitly or implicitly. The necessarily evaluative nature can explain negative feedback's harmful effect on intrinsic motivation (Hu et al., 2016).

Experimental studies have found that negative feedback decreases feelings of competence, while positive feedback satisfies competence and autonomy needs, thereby boosting intrinsic motivation (e.g., Burgers et al., 2015; Mabbe et al., 2018). Despite its often ego-threatening consequences, negative feedback is considered an unavoidable practice when providing performance evaluation (Dahling & Ruppel, 2016). Few studies have investigated negative feedback's effects, maybe because it seems very straightforward (Ryan & Deci, 2017, p. 156). Fong et al. (2019), in their meta-analysis of negative feedback on intrinsic motivation, found that overall intrinsic motivation was significantly lower after receiving negative feedback compared to positive feedback. However, negative feedback was not detrimental compared to neutral or no feedback. There seem to be some complexities concerning the effects of negative feedback on intrinsic motivation. Ryan and Deci (2017, p 156) emphasize that optimally challenging activities facilitate intrinsic motivation, and these types of activities will make people likely to fail some of the time and succeed some of the time. This implies that some negative feedback on an activity that stretches the individual's ability can make the activity more challenging, thus, more intrinsically motivating in some cases. Studies have also found that negative feedback can have a less demotivating effect when the individuals that perceive the feedback know how to improve their abilities (e.g., Hu et al., 2016). Something also in line with CET, which suggests that feedback will depend on its functional significance. Feedback perceived as evaluative and controlling will undermine intrinsic motivation, but if it is perceived efficacy-relevant, it may enhance it (Ryan & Deci, 2017, p. 486).

SDT suggests that whether the delivery of feedback is done publicly or not has an important influence on how feedback will affect intrinsic motivation. Public delivery of feedback is expected to decrease intrinsic motivation because there may be greater external pressure. This, in turn, can lower the internal PLOC because others are aware of the performance (Deci & Ryan, 1985).

Organismic integration theory (OIT)

In the lens of SDT, extrinsic motivation is a complex category of motivation (Ryan et al., 2009, p. 111). To address the determinants and consequences of extrinsic motivation, SDT differentiates between various types of regulations in extrinsic motivation. These are described in another mini-theory within SDT called *Organismic integration theory* (OIT; Deci & Ryan 2000). In this theory, it is argued that extrinsic motivations vary in their relative autonomy, with some forms of extrinsic motivation having a high degree of autonomy and some forms that are motivated by forces experienced as external to the self (Ryan & Deci, 2007). Extrinsic motivation is, therefore, in OIT, seen as a continuum of different motivational regulations. People can enact many values and practices for controlled reasons, and they are often prompted by others, such as families, peers, or cultural institutions. Fears of shame or guilt or being disapproved by others can pressure them. These motives are internal to the person but nonetheless controlling (Ryan & Deci, 2017, p. 181).

Internalization

Central to OIT is the process of internalization, which describes people's natural tendency to transform controlled motivations into more autonomous ones (Ryan, 1995). People will naturally tend to internalize the values and regulations of their social groups (Deci & Ryan, 2000, p. 238). Internalization is a process whereby people take external values, beliefs, or behavioral regulations and integrate them as their own (Ryan & Deci, 2017, p. 180). It is important to note that the view in SDT is that this process is active, which means that people do not just take in values and practices, but work to integrate what is internalized (Ryan & Deci, 2017, p. 182). People actively acquire social practices and do not just comply with them.

Like intrinsic motivation, internalization represents a natural growth process of active learning and self-extension (Ryan & Deci, 2017, p. 20). Therefore, effective internalization is highly relevant for satisfying the *need for competence* (Ryan & Deci, 2017, p. 183).

Internalization of social information also allows people to experience a sense of connectedness

to others – such as families, peer groups, organizations, or society in general (Ryan & Deci, 2017, p. 183). In this way, the need for relatedness will also play a central role in the internalization process. When individuals internalize practices and values from their families, peers, or organizations, they experience a sense of belonging and participation. People are more likely to internalize practices and values to groups they feel attached to or want to feel attached to than groups they don't care about (Ryan & Deci, 2017, p. 183).

The idea that a regulation can be more or less fully integrated with one's sense of self underscores that the internalization process will make people experience their actions as more autonomous and thus also experience higher satisfaction with the *need for autonomy*. By internalizing a regulation, the PLOC will shift from external to internal (Ryan & Deci, 2017, p. 183). Different forms of internalization will differentially satisfy the need for autonomy, which in turn will explain the maintenance, transfer, and stability of these regulatory structures. In sum, internalization is an important process through which people can fulfill their basic psychological needs.

The different types of extrinsic regulation in motivation

In OIT, there are four different types of extrinsic regulation. The least autonomous form of extrinsic motivation in OIT is labeled *external regulation*. When an individual is motivated through external regulation, they perceive to do the behavior because of an external contingency, like to obtain an external reward, comply with social pressure, and/or avoid punishment. External regulation can be effective in controlling behavior when rewards and punishments are powerful. Still, the problem with this regulation can be its lack of maintenance because if the rewards or punishments are not in place, the behavior is typically not sustained (Ryan & Deci, 2017, p. 184). This type of regulation has an external PLOC; the three other types of external regulation all have internal PLOC but to varying degrees. Another issue about external regulation discussed by Ryan and Deci (2017, p. 185) is that since the behaviors are

experienced as purely instrumental, it often leads them to accomplish them in the least effortful way and don't care about the quality.

The second type of motivation is introjected regulation. This is a more internal regulation than external regulation. However, it is still quite controlling because one performs such actions with the feeling of pressure to avoid guilt or anxiety or to attain pride (Ryan & Deci, 2000, p. 62). To a significant degree, behavior is in this kind of regulation freed from external contingencies, but it is still experienced as a demanding or controlling force. The significant difference is that it is acting on internal forces, acting in a sense that one "should" or "must" do something (Ryan & Deci, 2017, p. 185). It is an intrapersonal form of regulation that leads to the advantage that it is more likely to be maintained than extrinsic regulation since it does not rely on external contingencies. This type of regulation is often based on how individuals project that others are approving or disapproving of them based on their behavior. Others may or may not be judging, but when acting through this regulation, they will perceive they are judging. In our current study, this type of regulation is essential because the concept of sharing training data can make them feel others are judging their exercises. Plant and Ryan (1985) argued that if people are aware of themselves as if they saw themselves through the eyes of another, it can result in that they will have an evaluative position toward themselves. Rather than simply being engaged in the task, a person is concerned about how his or her performance might appear to others. This is often a projection; people may or may not be judging another person's performance. In introjected regulation, people have partially internalized values and regulations but do not fully accept them as their own (Ryan & Deci, 2017, p. 486). They are being controlled by internal forces that are not unlike being controlled by external forces, except that the process is, to a great extent, within them. Ryan (1982) found that when self-esteem was connected to proving themselves worthy, they lost intrinsic motivation for the activity. This indicates that this type of motivation can be detrimental to the need for autonomy.

The third type of external regulation is called identified regulation. The person has here identified with the personal importance of the behavior and therefore accepts its regulation as his or her own and sees it as something important to oneself. The experience of greater autonomy, therefore, characterizes this kind of regulation. When people act out of identified regulation, they are not simply complying with an external or introjected demand but instead acting because of a belief in the personal importance of the behavior (Ryan & Deci, 2017, p. 187). Compared to introjection, identification involves a more significant experience of volition, which has advantages in terms of its stability, persistence, and energy demands (Ryan & Deci, 2017, p. 188).

The fourth and most autonomous form of extrinsic motivation is called integrated regulation. This is a type of motivation where identified regulation has been fully assimilated into the self. This can occur when an individual sees new regulations in congruence with one's other values, basic psychological needs, and other identification (Ryan & Deci, 2017, p. 188). This type of regulation has the advantage of being the most autonomous and stable form of extrinsic motivation. The more fully integrated a value or goal is within a person, the more the person will be effective in self-regulating one's behavior (Ryan & Deci, 2017, p. 189). Behavioral regulations have been found to predict various outcomes within sports and exercise settings (Standage & Ryan, 2020, p. 42). For example, studies have shown a positive relationship between more autonomous motivation and exercise (Standage et al., 2008). It is also found that autonomous forms of motivation predict performance, both measured objectively and subjectively (Gillet et al., 2009, 2010)

Method

The following sections contribute to a more in-depth explanation of ontological and epistemological position, data collection and analysis, and data quality.

Ontological and epistemological position

The current study examined how self-tracking in training with modern sports watches and sharing training data on the social media app Strava influence athletes. We investigated this qualitatively, with semi-structured interviews, and utilized a Reflexive Thematic Analysis (Braun & Clarke, 2022). Our ontological position in conducting this study was relativism. In relativism, one sees reality as a product of human action and interaction, and it does not subscribe to the notion that a singular reality exists independent of human practices (Braun & Clarke, 2022, p. 173-174). In relativism, we cannot assume anything beyond, behind, or beneath that which we are seeking to understand. In this manner, relativism can be understood as an anti-foundationalist ontology because the idea of an ultimate foundation for and of truth is rejected. This is unlike realism (both simple and critical), where an assumed singular reality provides a foundation for the knowledge produced (Braun & Clarke, 2022, p. 174). We used an approach of social constructionism. The core of social constructionism is that the social world is constructed and that individuals seek an understanding of the world in which they live and work (Creswell & Poth, 2016, p. 24). Since these meanings are varied and multiple, the researcher looks for complexities in views. In social constructionism, it is common to work inductively to generate patterns or theories. The concept that the participants construct meaning in social constructionism has implications for practice. Meaning is often forged in discussions with other people; therefore, more open-ended questions are preferred (Creswell & Poth, 2016). It is essential in this view that researchers interpret what they find, which is shaped by the researcher's own experiences and background.

Study population

The sample in this study is thoroughly explained in the article's methodological section, page 10, and therefore no further explanation is given here.

Data Collection

Because we wanted to explore how modern sport-tracking technologies influence athletes through a social-constructionist approach, we chose a method that would enable us to investigate participants' experiences and thoughts on a deeper level, making a qualitative method suitable for this project (Pietewicz & Smith, 2014). Further, we conducted semi-structured interviews with open-ended questions.

Interviews are valuable sources when we want to create knowledge about experience and meaning and are an effective way for people to describe their experiences in rich and detailed patterns (Smith & Sparkes, 2016, p. 108). Interviews also provide complex and detailed insight into people's decisions, values, motivations, perceptions, beliefs, feelings, and emotions

As Smith and Sparkes (2016, p. 108) emphasize, we need rationales for doing interviews as a method that goes beyond simply claiming that an interview helps understand experience and meaning. Interviews also provide rich knowledge and allow us to provide detailed and complex insight into people's values, decisions, motivations, beliefs, perceptions, feelings, and emotions (Smith & Sparkes, 2016, p. 108). Our accounts, stories, descriptions, reports, etc. that we tell in an interview are never indeed formed inside a person but somewhat shaped by discursive resources made available to us by the society and culture we inhabit. Because of this, interview talk can reveal the sociocultural dynamics of human lives. They can illuminate how societies and cultures shape personal experience, meaning, decisions, values, motivations, etc. Interviews can also generate insights into the context in which people live. Another reason for using interviewing is that it can capture people's voices and provide an opportunity to put these in dialogue with other representatives witnessed in different interviews. Interviews can also offer insights into temporal dimensions of life, like past events, present actions, and imagined futures (Smith & Sparkes, 2016, p. 109).

“The purpose of the interview in qualitative inquiry is to create a conversation that invites the participant(s) to tell stories, accounts, reports, and descriptions about their perspectives,

insights, experiences, feelings, emotions, and behaviors about the research question(s)” (Smith & Sparkes, 2016, p. 103). Therefore, an interview is not a neutral tool and can not be objective. Interviews will always be shaped by numerous social factors, including the participant and the researcher’s motivations, memories, emotions, history, age, gender, class, race, etc. Also, the changing verbal and nonverbal interactions between them and the context of the interview itself, like where it is held and at which time, will influence the interview (Randall & Phoenix, 2009).

The first author conducted the interviews during the fall of 2021. Six interviews were done face-to-face, while two were done via video calls and one audio call. Holt (2010) discusses the advantages and disadvantages of telephone interviews. She discusses that, in practical terms, the advantage is that a telephone interview gives more control to the participants than a face-to-face interview. For example, if something came up at the time of the call, there was no embarrassment or difficulty in rearranging the appointment, which there may have been when meeting face-to-face (Holt, 2010, p. 116). In this project, we did not have to rearrange appointments. However, it was still an advantage not needing to meet up somewhere when doing digital interviews because it was less time-consuming and easier to schedule. It also made it possible to interview athletes who lived in different cities without spending time traveling.

We highly prioritized finding a time for the interviews where the participants had enough time since how long the discussion would take significantly depended on how much the interviewees would elaborate on each topic. Not having enough time for the interview could make us lose vital information. Therefore, when asking potential participants, we gave them a spacious estimate of how long the interview would take.

Even though there are some advantages to digital interviews, we considered interviewing face-to-face more advantageous. Therefore, the athletes who lived close to the first author were interviewed face-to-face. The athletes living in other places in the country were interviewed

digitally (two with video calls and one with only an audio call) due to practicality. The audio call was conducted via telephone, and the video calls were conducted via the video meeting service Zoom and followed the guidelines outlined by the Norwegian School of Sport Sciences for using Zoom when collecting research data (Appendix)

The interviews were audio-recorded with an Olympus Digital Voice Recorder (VN-541PC). Audio recording is necessary to ensure you get everything said in the interview to get the most accurate data set for the analysis (Kvale et al., 2015, pp. 205–206). Audio recording allows you to focus on the topic and the dynamics of the interview without worrying that you will forget critical information. In addition, you get to listen to the interview several times, making you more familiar with the interview data.

The way the interviews are done may affect the interviews. For example, if the interviews are done face-to-face or digitally can make a difference. One prominent aspect of doing digital interviews is the absence of body language. As Holt (2010, p. 117-118) discusses, there are times when an interviewer is deliberately reticent, but if there are no visual cues to compensate for the reticence, this can be a tricky line to thread. This is less of an issue with video calls. Video allows the participant and interviewer to hear and see each other. Still, they do not occupy the same physical space, leading to missed opportunities to observe the participant's physical space and react to body language and emotional cues (Cater, 2011).

The interviews lasted from 42-70 minutes. To begin each interview, the interviewer summarized essential details in the consent form and, for example, highlighted participants' anonymity and their right to withdraw from the project at any time. In addition, he informed the participants that if we had information about them from elsewhere, we would not add it as data in the current study. Only what they consented to, which was the interview and data from Strava, would be used as data material.

The interview followed a semi-structured approach, meaning a pre-planned interview guide was used to ask participants open-ended questions about the current study topic. The first

author conducted three pilot interviews to ensure that the interview guide worked. The pilot interviews were done with two male participants and one female. Two of the pilots were conducted via zoom and one face-to-face. After the pilot interviews, the participants were asked to comment on the different questions, the location, and how the interviewer was perceived, as well as if they had any topics or questions they suggested adding. Consequently, a few questions were added to the interview guide, whereas none were removed. The subjects of the interviews remained the same. Thus, there were no significant alterations. Also, when conducting the interviews that were going to be used as data material, participants were asked if they had something to add. If something was added, it was noted and became a part of the interview guide in the following interview.

Data analysis

The analysis utilized in this project is *Reflexive Thematic Analysis* (RTA) as described by Braun and Clarke (e.g., Braun et al., 2016; Braun & Clarke, 2006, 2022; Clarke & Braun, 2017). The choice of RTA was based on its theoretically flexible interpretative approach that facilitates the identification and analysis of patterns or themes in the data set (Braun & Clarke 2012). Braun and Clarke first outlined their approach to TA in 2006 but have since specified more details.

Generally, the analysis consists of six phases (Braun and Clarke, 2006, p. 87):

1. Familiarize yourself with data – Transcribing, reading, re-reading data, and noting ideas.
2. Generating initial codes – systematically code interesting features in the data
3. Searching for themes – sort the codes into potential themes, gathering all data relevant to each of the potential themes.
 - Themes are broader `patterns of meaning, underpinned by a central organizing concept – a shared core idea` (Clarke & Braun, 2017, p. 297)
4. Reviewing the themes – Checking if the themes work in relation to the generated codes and the entire data set, generating a thematic “map.”

5. Defining and naming themes – refine specifics of each theme and the overall story the analysis tells. Generate names and clear definitions for each theme.
6. Producing the report – Final analysis and producing a scholarly report. Relating back to the research question and literature.

Although, Braun and Clarke (2019) specify that these are not to be looked at as rigid steps and that you can find yourself at several of the steps simultaneously. RTA values a subjective, situated, aware, and questioning researcher and captures approaches fully embedded within the values of a qualitative paradigm (Braun & Clarke, 2022, p. 5). RTA is a flexible approach, but it is important to note that it is not atheoretical (Braun & Clarke, 2022, p. 157). As a researcher, you will always make theoretical assumptions about reality, knowledge, and language, whether we acknowledge it or not (Malterud, 2016). The theory is what gives RTA its analytic power and analytic validity (Braun & Clarke, 2022, p. 157).

One of the advantages of qualitative research is that it is not necessary to have all the data collected before starting the analysis (Braun & Clarke, 2013, p. 204). There often is no clear separation. In this project, the analysis started before all interviews were conducted.

The first stage of TA is to “Familiarize yourself with data,” which involves “Transcribing, reading, and re-reading the data and noting initial ideas” (Braun & Clarke, 2006b, p. 205). This started after the first interview where conducted. The second phase in Braun and Clarke’s (2006) approach is “Generating initial codes – systematically code interesting features in the data” (p. 87), and we also started to do this early in the process.

The familiarization process is not a passive process of just understanding the words. Still, it is an active process where you read the words “actively, analytically, and critically, starting to understand what the data mean” (Braun & Clarke, 2013, p. 205). Because of that, this process is time-consuming and will never actually end. The first author worked with the analysis in MAXQDA, where he first paraphrased interview segments before making codes. He

did the paraphrasing part in November/December 2021, and there was also some initial coding. During January and February, he conducted more of the coding.

In RTA, coding is seen as the smallest unit of the analysis. Coding forms the block building from which you go further to develop themes. A code is an analytically interesting idea, concept, or meaning associated with data segments. Codes capture specific and particular substances within the dataset, which is of relevance to the research question (Braun & Clarke, 2022, p. 52)

At the end of January, the interviewees were followed up and asked if they had something else to add to the earlier interviews. Here they also could read through the transcript. From this process, one of the interviewees clarified how she used her heart rate monitor actively in some periods and less active in others, but this was not something that had implications for the analysis.

The process of sending transcripts to participants is an extensively used method in qualitative research, known as member checking (Smith & McGannon, 2018). In member checking, validation is often done by returning the data and results and asking them to provide input on whether the data are accurate and results accurately reflect their experiences (Smith & McGannon, 2018). This process is seen as quality control and a benchmark of rigor in qualitative research, but it is questionable if it does develop rigor. As Denzin (2017, p. 12) states, there are no guarantees for methodological certainty, and all inquiry reflects the standpoint of the inquirer. In member checking, the researcher and the participants are the member checkers; none can step outside their own experiences. Hence, member checking will not be objective. There is also no reason to make qualitative research objective. As Braun and Clarke (2013, p. 285) note, the assumptions in member checking need to be considered. Member checking assumes that participants are the ultimate authority on their own experiences. Still, understanding and representing participants' experiences requires interpretative activity, which is always informed by our assumptions, values, and commitments. Also, as researchers,

we view participants' experiences from a different angle than themselves; we identify and interpret aspects of their experiences that they may not be fully aware of. We often ask further questions than they do to move beyond common-sense understandings (Braun & Clarke, 2013, p. 285). Because of this, we chose not to ask the participants for their opinions about whether the interview transcript was accurate. The process of sending transcripts was mainly to ask if they had anything to add.

In early February, the initial codes were generated, and the first author started to generate potential themes across the data more actively, go back to the interviews first coded, and look for more codes or make changes in the initial regulations. The interaction with the data from here on and through the next three months consisted of generating and reviewing themes, going back and reviewing codes, developing some new codes, and seeing those new codes in relation to the themes created. The themes would also change when the writing process started. The last four steps of TA were therefore worked on simultaneously, with searching for themes, reviewing the themes, defining and naming the themes, and writing. As Braun and Clarke (2022, p. 118) specify, writing is an integral part of the analysis because your analysis takes shape in writing. It is not until you start writing about your analysis and presenting the themes that you are able to see whether your analysis makes sense. In contrast with much statistical and quantitative research, where the reporting often happens after the analysis has been completed.

Data Coding

The coding in this project was done with an inductive orientation, which means that the dataset is the starting point for engaging with meaning. At a 'pure 'level, it is induced by the idea that qualitative research can 'give voice 'to the participants to tell their stories straightforwardly- (Braun & Clarke, 2022, p. 56).

The initial coding was conducted by noting data segments of interest and giving them a code label. Although, after grouping the codes generated at first, a new round of coding was conducted, which was more deductive because the first author had then identified three broad candidate themes: (1) motivational factors, (2) stressful factors, and (3) avoiding stressful

factors. The new round of coding consisted of a more deductive process where the first author identified codes that could fit into these themes. After reviewing these themes, we started to think more about which theoretical framework the themes would fit. Hence, we found that the motivational factors would fit into the framework of SDT (Deci & Ryan, 2000).

In addition to inductive coding, the data were primarily coded semantically. Semantic codes capture explicitly expressed meanings and stay close to what the participants say.

Data quality

Subjectivity and reflexivity are two important subjects in this study's ontological and epistemological assumptions. Subjectivity is essential for a good RTA, and reflexive research treats knowledge as situated and shaped by the practices and processes of producing knowledge (Braun & Clarke, 2022, p. 12).

Berger (2015) defined reflexivity like this:

It means turning the researcher's lens back onto oneself to recognize and take responsibility for one's own situatedness within the research and the effect it may have on the setting and people being studied, questions being asked, data being collected, and its interpretation. As such, the idea of reflexivity challenges the view of knowledge production as independent of the researcher producing it and of knowledge as objective (Berger, 2015, p. 220).

This stance may influence the research in three ways. First, they can affect access to the `field` because participants may be more willing to share their experiences with a researcher perceived to be sympathetic to their situation, and the researcher may be more knowledgeable about helpful resources. Second, they may shape the relationship between the researcher and the participant, affecting the information participants are willing to share. Third, the researcher's background and worldview affect how one constructs the world, uses language, and chooses the lens for filtering the information gathered and how to make meaning of it. (Berger, 2015, p. 220).

All of this will shape the findings and conclusions in the study, which is, therefore, essential to consider. In this research, the author is himself an athlete who interviews other athletes. His interest in the subject emerged from his own experiences with self-tracking with a sports watch. This puts him in what Berger (2015) refers to as an “insider’s position.” An insider position can have advantages like an easier entrée; a head start in knowing the topic, and an understanding of participants’ nuanced reactions (Berger, 2015).

The first author’s point of view when conducting this study is a critical lens on which consequences self-tracking might bring. His interest in the topic started when noticing himself getting upset when he performed poorly in relation to his standards – like running slower than he thought or with a higher heart rate. He has tried training with and without tracking with his watch, which makes him have his own experiences with the differences between tracking and not.

Trustworthiness is another subject relevant to data quality. Randall and Phoenix (2009) discuss the truth problem in qualitative research. In interview studies, they emphasize that the person being interviewed can never tell us the whole truth. “For memory is by definition a factionalizing faculty” (Randall & Phoenix, 2009, p. 130), and one will never remember everything in precise detail. It is also possible that interviewees lie in the example, glossing over vital information. But even if they try to be honest, they will be constrained by the degree of self-insight they have acquired to date and their ability to match words and phrases to their inner thoughts and feelings (Randall & Phoenix, 2009, p. 130-131).

A lot of factors can influence the answers in an interview. For example, the psychological state the participant is in when they are interviewed and the experiences that are easiest to remember can influence the answers. For example, the athletes interviewed could be in good or bad shape. For example, one of the athletes highlighted that he had an excellent period, with lots of good results, right before the interview. It is not unlikely that he could have answered the questions differently if he had been through a challenging period. There were also

a couple of athletes that were, or had recently been, injured when they were interviewed, which may have made them aware of more of the negative aspects of self-tracking.

Smith and Sparkes (2016, p. 108) emphasize that while interviews help generate knowledge about the experience, two caveats must be stressed. The first is that an interview does not provide a transparent window into the interiority of experience or unmediated access to a private realm of meaning. This is because conversations *constitute* experience rather than simply reflecting or reproducing the experiences. Also, people draw on discourses from society and culture to build and understand conversations. This means that interview material capture shared cultural understanding and enactments of the social world. Therefore, conservation needs to be treated as socially created, and experience and meaning as inherently shaped by our sociocultural landscape.

The second reason emphasized is that an interview is not a privileged or distinctive means of understanding experience or how people make sense of experiences happening to them (Smith & Sparkes, 2016).

Ethical Considerations

Ethical approval was obtained from *Norwegian Centre for Research Data (NSD)*.

In social sciences, understanding and interpretation is a part of the process. Hence, perspectives from different backgrounds and theoretical standpoints may give variations of the same material (Den nasjonale forskningsetiske komité for samfunnsvitenskap og humaniora (NESH), 2018). For this reason, it is essential to consider and explain how my values and viewpoints might affect my interpretations. In this project, I investigate athletes competing in the same sport as myself. This makes me have some experiences that are likely similar to the participants' experiences. And this will affect me when I interact with the data.

It is essential to consider unintentional and unwanted consequences. This study aims to interview athletes about their own experiences, and there will be no intervention. Because of this, not much is likely to hurt the athletes. On the other hand, you might think that the athletes

can begin to think about aspects they have not considered earlier after getting interviewed about this subject.

Privacy is another essential ethical aspect to consider. NESH (2018) emphasizes that the researcher must be especially careful when the individual assists in gathering information, for example, by being available for observation or interviewing or when the individual can be identified. Many of the athletes interviewed in this project are significant athletes in the Norwegian middle- and long-distance running milieu and are likely to be recognized if we don't anonymize the person well enough. E.g., is performance level interesting to report, but reporting their personal bests combined with their age would have made the athlete easy to recognize. Knowing the athletes' exact performance level, how they train, and what they are doing besides the sport could have strengthened the quality of the research. Still, we saw it as more important to ensure anonymity.

The project participants should be given enough information about the project, who will have access to the information they provide, the eventual consequences of participating, and how the information will be used (NESH, 2018). Because of this, an information letter was given to the participants, and they had to consent before we started the interview. For the consent to be valid, it has to be voluntary, informed, specific, documentable, and easy to withdraw from at any time (NESH, 2018). To ensure that the participants understood the information, a summary of the consent letter was read to them before starting each interview. Here the interviewer also emphasized that they could withdraw from the project at any time without giving a specific reason. They also got informed that information we "accidentally" knew about them could not be used as information in the project. This was especially important to emphasize in the cases when the interviewer interviewed people he knew personally. The fact that the researcher knows some of the participants raises some additional concerns that we must be aware of. Interviewing people one personally knows is known as "acquaintance interviews" (Garton & Copland, 2010) and is acceptable in qualitative research. Important to note that you

enter into a dual relationship with the person (e.g., a participant and a friend) and that this raises some additional ethical concerns and some inflexible ‘do’s and don’ts’ (Braun & Clarke, 2013, p. 87):

- Don’t use your pre-existing relationship to pressure the person to become a participant or disclose information in the interview. Therefore, it is essential to emphasize that participating is voluntary and that they can withdraw at any time.
- If a friend discloses something in the interview that is new to the interviewer, this information should be seen as confidential to the interview (unless the friend raises it again later)
- Only the audio-recorded information counts as data, not the things you happen to know from other settings.
- If you have a hierarchical relationship with the person you are interviewing, you have to be very sensitive to how your position could be experienced as potentially coercive, even if you don’t think so. This study could have been if I were a coach or had another role in the management of some of the athletes I was going to interview. Here I am an athlete that will interview fellow athletes, which will, therefore, most likely not be an issue. There may be a perceived hierarchical relationship between athletes on higher vs. lower performance levels and between younger and older athletes. Given the inclusion criteria, the participants will be at approximately the same performance level as myself or higher, making this not likely an issue. However, before recruiting athletes significantly younger than me, especially in my training environment, I will have to consider if this person may perceive a hierarchical relationship between us.

NESH (2018) also point out that you should consider third parties that may be given information. Interview studies often include information about more people than the persons focused on. This could happen if the athletes interviewed also provided examples of how other

athletes use their sports trackers. It is, therefore, essential to consider the privacy of this third person and to also treat this information with confidentiality and anonymize the person.

Scientific honesty is also important. The researcher should always seek the truth.

Fabricating data or forging the data material should not happen. Plagiarism should not occur, and it is important to reference correctly.

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Appendix 1: Informed consent

Vil du delta i forskningsprosjektet

”Hvordan påvirkes idrettsutøvere av å bruke sportsklokker og apper til å monitorere trening?»

Dette er et spørsmål til deg om å delta i et forskningsprosjekt hvor formålet er å undersøke hvordan idrettsutøvere bruker sportsklokker og treningsapper (f.eks. Strava), og hvordan dette påvirker trening og restituasjon. I dette skrevet gir vi deg informasjon om målene for prosjektet og hva deltakelse vil innebære for deg.

Formål

Dette er et forskningsprosjekt som skal undersøke hvor mye satsende idrettsutøvere innen mellom- og langdistanseløp bruker teknologi som sportsklokker og apper i forbindelse med treningen. I hvilken grad blir man påvirket av hele tiden å ha tilgang til de treningsdataene man får med bruken av teknologien? For eksempel: Blir man mer opptatt av hvor mye mengde man løper? Blir man mer opptatt av farten? Påvirker det restitusjonsfasen, ved at man kobler mindre ut? Påvirker det motivasjonen på noen måte, positivt eller negativt?

I dette forskningsprosjektet ønsker vi å finne svar på:

- Hvordan påvirkes utøvere av å bruke sportsklokker og apper i treningen sin?

Hvem er ansvarlig for forskningsprosjektet?

Dette er et forskningsprosjekt til masterstudent Iver Matias Linge Glomnes. Gro Jordalen (Institutt for idrett og samfunnsvitenskap, Norges idrettshøgskole (NIH)) er veileder og prosjektansvarlig. NIH er behandlingsansvarlig institusjon.

Hvorfor får du spørsmål om å delta?

Vi ønsker å rekruttere mellom- og langdistanseløpere som konkurrer på nasjonalt nivå eller høyere i Norge. Du som utøver kan gi oss verdifull informasjon som kan ha stor betydning for andre utøvere, trenere, støtteapparat, samt et internasjonalt vitenskapelig miljø.

Hva innebærer det for deg å delta?

Det innebærer å delta i et intervju hvor du forteller om din bruk av sportsklokker og apper i forbindelse med trening og konkurranse. Hvor lang tid det tar avhenger av hvor utfyllende du svarer på spørsmålene, men sannsynligvis ca. 60 minutter. Intervjuet vil tas opp med lydopptaker, og informasjonen du gir blir behandlet konfidensielt. Datamateriale i dette prosjektet er informasjon du gir i dette intervjuet, samt eventuelt informasjon om treningsøktene dine fra apper som Strava eller lignende, dersom du deler treningsinformasjon i slike forum og samtykker til at vi kan bruke informasjonen. Dette for å eventuelt skaffe et tydeligere bilde av din bruk av appen(e). Hovedfokuset vil likevel være intervjuet.

Det er frivillig å delta

Det er frivillig å delta i prosjektet. Hvis du velger å delta, kan du når som helst trekke samtykket tilbake uten å oppgi noen grunn. Alle dine personopplysninger vil da bli slettet. Det vil ikke ha noen negative konsekvenser for deg hvis du ikke vil delta eller senere velger å trekke deg.

Ditt personvern – hvordan vi oppbevarer og bruker dine opplysninger

Vi vil bare bruke opplysningene om deg til formålene vi har beskrevet i dette informasjonsskrivet. Vi behandler opplysningene konfidensielt og i samsvar med personvernregelverket. Det er kun forskningsgruppen ved Norges idrettshøgskole som vil få tilgang til innsamlede data. Data vil bli lagret i henhold til NIHs retningslinjer for sikker oppbevaring av forskningsdata frem til prosjektets slutt.

Hva skjer med opplysningene dine når vi avslutter forskningsprosjektet?

Opplysningene dine slettes når prosjektet avsluttes, etter planen 30. juni 2023.

Dine rettigheter

Så lenge du kan identifiseres i datamaterialet, har du rett til:

- innsyn i hvilke personopplysninger som er registrert om deg, og å få utlevert en kopi av opplysningene,
- å få rettet personopplysninger om deg,
- å få slettet personopplysninger om deg, og
- å sende klage til Datatilsynet om behandlingen av dine personopplysninger.

Hva gir oss rett til å behandle personopplysninger om deg?

Vi behandler opplysninger om deg basert på ditt samtykke.

På oppdrag fra *Norges idrettshøgskole* har NSD – Norsk senter for forskningsdata AS vurdert at behandlingen av personopplysninger i dette prosjektet er i samsvar med personvernregelverket.

Hvor kan jeg finne ut mer?

Hvis du har spørsmål til studien, eller ønsker å benytte deg av dine rettigheter, ta kontakt med:

- Norges Idrettshøgskole ved masterstudent Iver Matias Linge Glomnes, tlf.: 98018667, eller epost: imglomnes@nih.no
- Norges Idrettshøgskole ved prosjektansvarlig Gro Jordalen, tlf.: 23262351, eller epost: groj@nih.no
- Personvernombud ved NIH, epost: personvernombud@nih.no

Hvis du har spørsmål knyttet til NSD sin vurdering av prosjektet, kan du ta kontakt med:

- NSD – Norsk senter for forskningsdata AS på epost (personverntjenester@nsd.no) eller på telefon: 55 58 21 17.

Med vennlig hilsen

Prosjektansvarlig
Gro Jordalen (Ph.D.)

Masterstudent
Iver Matias Linge Glomnes

Samtykkeerklæring

Jeg har mottatt og forstått informasjon om prosjektet *Hvordan påvirkes idrettsutøvere av å bruke sportsklokker og apper til å monitorere trening*, og har fått anledning til å stille spørsmål. Jeg samtykker til:

- å delta i intervju
- at data fra Strava eller lignende apper kan benyttes

Jeg samtykker til at mine opplysninger behandles frem til prosjektet er avsluttet

(Signert av prosjektdeltaker, dato)

Appendix 2: Interview guide

Intervjuguide

Starte med litt info. Gå gjennom infoen som blir gitt i informasjonsskrivet.

- Formålet med studien er å undersøke korleis utøvarar brukar og blir påverka av å monitorere trening med moderne sportsklokker og treningsappar.
- Eg (Iver Matias Linge Glomnes) er masterstudent og skal bruke data som blir samla inn her i mi masteroppgåve, som evt. også kan bli ein vitenskapeleg publikasjon. Gro Jordalen er vegleiar og ansvarleg for prosjektet.
- Deltakaren vil bli anonymisert. Opplysningar som kan identifisere vil ikkje bli tatt med.
- Vi kjem ikkje til å bruke informasjon om deg som vi evt. har frå før, berre det som blir samla inn her (spesielt viktig når eg intervjuar bekjente)
- Om du vil trekke deg, kan du når som helst kontakte oss for å gjere det. Du treng ikkje å gi ein grunn.

Kan du fortelje litt om deg sjølv som utøvar og om livet elles?

- F.eks. Ambisjonsnivå. Prestasjonsnivå. Kor lang erfaring med idretten
- Studier/jobb
- Stipend/sponsorar/annan støtte?
- Miljøet ein er i – både treningsmiljø og miljø utanfor idretten.

Korleis går det med idretten for tida?

- Framgang/stagnasjon.
- Skadar/sjukdom/overtrening?
- Føler seg motivert?

Kan du fortelje litt om eiga trening og treningsfilosofi?

- Trenarstyrt eller utøvarstyrt? Ca mengde, hyppigheit av harde og halvharde økter, intensitetsstyring osv.

Brukar du ei GPS-klokke? Evt. korleis?

- Kor ofte? Kva funksjonar?
- Kvifor dei vel å bruke det eller la vere å bruke det.
- Om dei alltid brukar den, eller av og til lar vere.
- Brukar dei klokka til å styre treninga?
- Nokre klokker har funksjonar som seier kor lang restitusjonstid ein har, eller gir beskjed om at «no er det på tide å trene». Bryr dei seg om desse funksjonane?

Om du gløymer klokka, eller av ein eller annan grunn ikkje har moglegheit til å bruke den, korleis føles det?

- Stressande å springe «i blinde», eller litt befriande?

Legg du ut øktene dine på Strava eller liknande?

- På alle økter, eller av og til? Legg til beskrivelse av økta? Deler mykje eller lite frå øktene? Viktig at det ser bra ut?
- Alltid gjort/begynt nyleg/gjort tidlegare?
- Reflektere over motiv for å legge ut, eller ikkje legge ut.
- Korleis blir strava eller liknande brukt til å analysere eiga trening? – farta på ein runde/eit «segment», volum etc.?

Er du opptatt av å følge med på treningsvolum?

- Spesifikt mål om kor mange km etc.? I så fall, forsterkar klokka kor oppteken du blir av å følgje med?
- Blir klokke/app brukt til å følgje med, eller brukar du andre verktøy som treningsdagbok etc.
- Opplever dei det kontrollerande på nokon måte? For eksempel at ein må gjennomføre treninga for å ikkje «øydeleggje» statistikken.

Bryr du deg om farta på øktene dine?

- På alle økter, eller berre på nokre økter?
- Auke eller redusere tempoet på økter for at snittfarta skal bli høgare/lågare? Føler seg bunden til å ligge i ei spesifikk fart?
- Unngår kupert eller ulendt terreng for å unngå treige km?
- Evt.: betyr det noko om økta skal leggast ut på strava el., eller ikkje.

Når du kjem heim frå trening: brukar du tid på å undersøkje statistikken frå økta di?

- Mykje tid? Prioriterer før mat/drikke og dusj?
- Kva statistikkar?

Brukar du Strava eller liknande til å undersøkje andre si trening? - Evt.: trur du dette påverkar deg på nokon måte?

- Stressmoment, ekstra motivasjon, eller ingen/liten påverknad?
- Om dei tenkjer meir på trening mellom øktene?
- Om det fører til meir trening, og om dei meiner det er positivt eller negativt.
- Opplevast det som kontrollerande på nokon måte?

Generelt, korleis trur du bruk av sportsklokke eller appar med treningsdata påverkar deg?

- For eksempel om det kontrollerer treninga i stor grad.
- Om det endrar motivasjonen på nokon måte.
- Om det er eit stressande moment, eller om det verkar motsett ved at ein føler ein har betre kontroll.
- Også på andre måtar enn det som er nemnt?

Påverkar det deg ulikt i ulike periodar?

- Kan tenkast at det er motiverande når det går bra, demotiverande når det går dårleg.
- Kanskje forskjellig i ein treningsperiode og ein konkurranseperiode?
- Påverkar kor stressa ein er i andre delar av livet dette?

Legg du merke til korleis fokus på idrett og trening påverkar deg mentalt?

- Korleis påverkast du av det å bruke klokke, og analysere treninga, mentalt?
- Kan du føle deg mentalt sliten?
 - Korleis vil du beskrive det?

Kva gjer du når du føler deg mentalt sliten?

- Likar du å vere aleine, eller saman med andre?
- Likar du å vere i aktivitet, eller treng du også å vere fysisk roleg når du skal slappe/kople av mentalt?
- Er det andre aktivitetar som hjelper deg å koble av?
- Med tanke på pulsklokke/utstyr, analyse, Strava, osv. Treng du å ta pause frå dette?

Korleis påverkar fokus på idrett og trening søvnen din?

- Brukar du pulsklokke for å følgje med på søvn? Er søvn noko du kartlegg og analyserer?
- Kva betyr søvn med tanke på (fysisk og mental) restitusjon for deg?
 - Kor viktig er søvn for at du skal føle deg restituert?
- Kan det gå ut over søvnen din at det er mykje som skjer med tanke på trening/konkurransar? Evt. trur du det å analysere treninga forsterkar dette?

Påverkar fokus på idrett og trening, og det å monitorere og analysere trening, humøret ditt?

- Blir du glad, føler deg energisk, og at du er i balanse, eller kan det verke motsatt, at du blir trist og lei, føler deg sliten og tappa for krefter?

Appendix 3: Usage of Zoom for gathering of research data at Norwegian School of Sport sciences

Rutine for bruk av Zoom til innsamling av forskningsdata ved NIH

1. Virkeområde for denne rutinen

Denne rutinen gjelder for all bruk av Zoom som omfatter eller behandler persondata klassifisert som oransje eller røde etter instruksen «Om eierskap og klassifisering av data ved NIH - hvordan vurdere hvilken klasse du skal bruke». Rutinen gjelder for all bruk av Zoom i forskningsprosjekter ved NIH.

Merk: det er ikke tillatt å benytte Zoom utenfor NIH (<https://nih.zoom.us>) til innsamling av forskningsdata.

2. Forutsetninger

2.1 Tekniske forutsetninger

- Man skal kun bruke NIH sin variant av Zoom, som bruker NIH-bruker ID og Feideinnlogging (SSO), på adressen <https://nih.zoom.us/>
- Den parten som er ansvarlig for samtalen og eventuelt opptak skal kun benytte NIH-eid og -driftet utstyr.
- Utstyret skal være godkjent for behandling av oransje og røde data etter NIHs retningslinjer for lagring.

2.2 Andre forutsetninger

- Den som er ansvarlig for samtalen skal ha satt seg inn i, og følge, hele denne rutinen.
- Eventuelle unntak av hele eller deler av denne rutinen skal være godkjent av [avdelingsleder IT ved NIH](#).
- Skal det gjøres opptak skal det innhentes godkjenning fra kan bare lagres på utstyr eid-, satt opp- og driftet av NIH.

