# Towards Understanding Digital Sharing Practices in Outdoor Sports

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## Abstract
Online social networks have made the sharing of personal experiences with others – mostly in form of photos and comments – a common activity. At the same time, an ever increasing number of dedicated sport tracking apps on our smartphones allow us to record statistical and biometric parameters from our workouts and, subsequently, share them with family, friends, and other followers. However, it is unclear if the available set of tracking parameters (such as an average speed, or calories burnt during a sports activity) is expressive enough when it comes to sharing in different sports. In our ongoing meta-study across three outdoor mountain sports, we have investigated whether those tracking apps meet the actual sharing requirements of amateur skiers, climbers, and trail runners. Ultimately, we aim to identify both universal and sport-specific needs for sharing. In this paper, we discuss our initial insights.

## Author Keywords
Information sharing; skiing; climbing; trail running; qualitative analysis.

## ACM Classification Keywords
H.5.m [Information interfaces and presentation (e.g., HCI)]: Miscellaneous

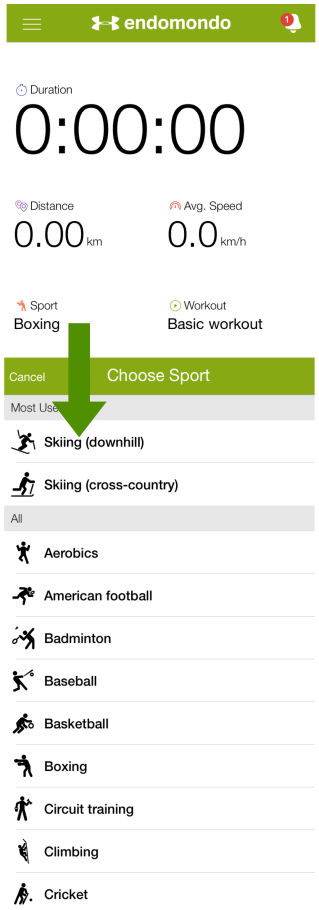


**Figure 1:** The variety of sport disciplines supported by a modern tracking app. Original image source: Endomondo.

## Introduction

Today, large volumes of user-generated and user-mediated content populate social network. With the amount of technology that we use in our everyday life to access those social networking services, sharing our personal information has become a truly ubiquitous phenomenon. At the same time, we increasingly use smartphones and wearable devices as sensing instruments to record personal habits, monitor health, or keep track of our physical activities [8]. Parts of that record can be (and often are) shared using social network with a simple press of a button (e.g. "Post on Facebook"). While current sports applications support a multitude of disciplines (see Figure 1), tracking features are usually limited to a simple set of parameters (e.g. average speed or calories burnt). Our work is motivated by the fact that such apps usually do not accommodate the tracking of finer details within specific sports, e.g., tracking hazards in back country skiing, or marking climbing routes. As a result, sharing through such apps in “unusual” sports activities may not be expressive enough. We thus aim to chart the similarities and differences between sharing needs and practices in different sports.

In order to do so, we have begun a meta-analysis of three prior studies – each conducted by a subset of us and each investigating information sharing in one specific mountain sport: skiing, climbing, and trail running. Two of these are traditional mountain sports – skiing and rock climbing. The third discipline – trail running – is a widely popular and easily accessible outdoor activity often involving mountainous terrain. These sports activities differ among several dimensions (e.g. presence of sport partners, risk implications, technology usage), yet all three see outdoor enthusiasts widely practice digital sharing before, during, and after the activity. Across all three studies, we recruited and interviewed a total of 38 amateur sportsmen who were actively involved in one of the three outdoor disciplines. Our initial findings show that the characteristics of these three sports can inform the design of technologies for sharing by taking into account the particular context of a given sport.

## Related Work

The sharing of physiological data (e.g., workouts) has seen an increased interest within the domain of HCI for sports. Ojala [13] discussed motivations for tracking and sharing details of training routines and physical exercises in online sports communities. Prior work showed that social sharing contributes to the overall user experience, enjoyment of workouts [1, 12], and can be a powerful motivator for health activities [11, 16]. Curmi et al. [3] discovered that sharing real-time physiological data (e.g. heart rate) can create a bidirectional social connection between sportsmen and their supporters. Others have looked at privacy concerns [6], associated risks [15] and preferences [14] regarding the tracking (and potential sharing) of personal health data.

Knaving et al. [7] proposed design guidelines to inform future motivation technology for running. Another example was provided by Kajastile et al. [5] who collected requirements for information sharing and planning in climbing. Fedosov et al. [4] co-designed some prototypes with back-country skiers. However, no past research has explored common features and peculiarities of different sports in order to inform the design of technology for sharing. This work is the first (to our knowledge) that attempt to fill this gap. Using our preliminary results, we discuss design dimensions that future technologies may address to support sharing practices across different outdoor sports.

## The Meta Study

We adopted a meta-analysis approach combining the insights from our three independent studies across multiple

countries in order to provide a more unified account of current sharing behaviour of outdoor sport enthusiasts. Our data includes accounts from downhill skiers (20 participants), trail runners (13 participants) and rock climbers (15 participants), all gathered through interviews. We chose amateur sportsmen because past work has shown that professionals have a distinct set of needs [9]. All three sports are usually practised outdoors, typically in mountain regions, and characterized by a strong relation between athlete and nature. However, they not only differ in the level of risk-taking attitude and overall safety concerns, but are also performed in different social settings: in groups, pairs, and as individuals. The goal of our exploration was to gain insights on four core questions that allow us to create a comprehensive account of the sharing practices in these three sports: *"What do sportspeople share"?*, *"Who do they share it with"?*, *"How do they share"?* and *"Why do they share"?*.

We began our meta-analysis by looking at the verbatim transcriptions of all interviews performed in all three studies. All transcripts were coded by four independent coders (the material was partly assigned on the base of the native language of the coder). Later, we translated the segments of text relevant to our research questions into English. During the analysis, we first adopted a temporal research lens [2] in order to structure the data and to enable aggregated themes to emerge. In this way, we identified the most relevant data shared before, during, and after the activity in each sport (see Table 1). We then repeatedly iterated our analysis between the empirical categories emerging from the data and the recurrent reading of relevant literature [10].

## Initial Results

We report our preliminary findings in the form of four design dimensions to support sharing practices of outdoor sports.

| Discipline | Before | During | After |
|---|---|---|---|
| Skiing | Level and type of snow, weather conditions, open tracks and lifts | Location (meeting points, tracks) Contextual data (hazards, working time of the lift) | Pictures and videos |
| Climbing | Weather, Cliff details (exposure, grades of difficulty, quality of the rock) | Commands for managing the rope, personal conditions, weather, notes about the climb | Pictures, story of the experience |
| Trail running | Weather, training plans | Live GPS, heart rate | Track, pace, distance |

**Table 1:** A summary of data types shared in skiing, climbing and trail running with regard to time.

*Content Selection*

The type of sport practised significantly influenced the type of information shared. Outdoor enthusiasts would vary the amount and type of shared data based on how intense the activity is, or whether they deemed it "exceptional" in some aspects. In the case of running, participants were reluctant to share individual workouts as improvement is gradual and they were afraid to spam their connections. Skiers instead would generously share captured pictures and videos from their trips, despite the extra effort required to edit and assemble content generated by a group (e.g. cutting best video footage) [4]. Climbers usually did not share trainings or regular trips, but just exceptional personal achievements.

*Audience Selection*

Our initial meta-analysis indicates that the social context in which a sport is performed strongly affected the audience

selection of a sharing activity. Individual sportsmen, e.g. runners, were likely to share their data publicly, while those participating in more group-oriented sports, e.g., skiers and climbers, were more likely to share within the groups that the activity took place in. Nevertheless, all participants were generally conscious about whom they shared the information with. Climbers preferred direct communication with trusted climbers, e.g., within closed Facebook groups or face-to-face. Skiers were interested in sharing information about possible on- and off-piste hazards with everyone, in order to contribute to overall safety.

*Privacy*

Many participants in the three underlying studies expressed privacy concerns. Location data (e.g. GPS tracks) were of particular importance for runners, as they realised that a lot of information about their daily activities could be derived from their running tracks. For skiers on the other hand, sharing location information to the rest of the group was important – not only from a safety point of view, but also for organizational purposes (e.g., to decide where to meet for après-ski). In climbing, information about location was limited to cliques (groups of advanced climbers with a well-developed personal relationship), in order to preserve the wilderness and exclusivity of such places. While many of our participants did reflect on the topic extensively, it seems that their privacy concerns carries beyond sport tracking apps towards broader discourse on personal privacy.

*Motivation to Share*

Among the reasons why amateur sportsmen gather and share data, we found *companionship and the need of finding a training partner* to be an important motivating factor, as sharing data with sport partners was seen as helping to sustain their motivation for training. Other motivations were: *promotion of activities or location*, e.g., a runner remarked that she explicitly shared maps of runs to communicate that a particular location worked as the ideal destination for many activities; *social appreciation and connectedness*, i.e., some participants expressed the wish to communicate the achievement of an important training goal to their friends and family; *safety*, i.e., participants in all three disciplines would share information with others, even unknown people, if they encountered some danger during the activity – for example, weather conditions are of particular importance as they may affect outdoor activities significantly.

## Discussion and Future Work

In this paper, we presented preliminary insights from a meta-analysis that coded interviews from three individual studies spanning three different mountain sports: skiing, trail-running, and climbing. Given the moderately small sample size and the qualitative nature of our study we do not aim to generalize our findings to the whole population of outdoor enthusiasts. However, from the rich data we collected, we found that current sport tracking applications rarely support the complex dimensions of sharing sought by our participants, and that they offer only limited opportunities in terms of choosing audiences and content. This suggests that future technology could improve support for sharing in sports by taking more nuanced sharing needs into account. With this initial analysis we seek feedback from the community, in particular on how the presented factors affect sharing practices in outdoor mountain sport. We are currently continuing our meta-analysis and investigate how our initial dimensions can be translated into guidelines that will influence the design of future sharing services for outdoor sports.

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