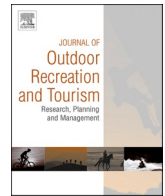


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## Research note: Ski touring on groomed slopes and the COVID-19 pandemic as a potential trigger for motivational changes

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### ABSTRACT

Ski touring on groomed slopes is a relatively new outdoor sport that has steadily been gaining interest. So far, little scientific attention has been given to this outdoor activity. Thus, few questions have been asked about the motivation for practising this sport, and even fewer about whether the current COVID-19 pandemic has had an impact on the frequency of and motivation for ski touring. For this reason, we conducted a large-scale study ( $n = 6802$ ) in the Austrian Alps. Results revealed that the COVID-19 pandemic has not changed the motive structure for ski touring; however, the findings showed that many people have even started to practice this sport. This research note contributes to the existing knowledge by (a) documenting ski tourers' motives using a large sample, (b) giving insights into the effects of the COVID-19 pandemic on this specific outdoor sport, and (c) showing COVID-19-related impacts on practicing ski touring.

#### Management implications:

- No changes in motivational reasons for ski touring due to COVID-19 pandemic.
- Trend towards outdoor sports, especially ski tours on groomed slopes in the alpine region of central Europe. Amplification of the trend due to the pandemic and the associated restrictions.
- As an outdoor sport, ski touring on groomed slopes offers versatile added value for ski tourers, but also huge potential for ropeway operators.
- This soft slope tourism can also show alternatives to temporary ropeway closures in times of the COVID-19 pandemic and could also promote tourism (especially day tourism) in small circles at the regional level.
- The increase in beginners naturally raises the question of whether this group needs special offers or how to deal with beginners on the slopes. On the other hand, this also raises the question of how to deal with the increase in ski slope users in general.

### 1. Introductory literature

Physical activity in alpine environments, especially ski touring on groomed slopes, has been booming in recent years (Ernstbrunner et al., 2020). Though, a fundamental change in the situation has resulted from the outbreak of the COVID-19 pandemic, which had a major impact on global tourism, alpine regions, and therefore also ski destinations. The virus led to a shortened season in 2020 with closures in mid-March, followed by the repeated postponement of planned steps of re-opening. In the subsequent season of 2020/2021, ski lifts in Austria were finally allowed to open over Christmas, but under constantly

changing conditions, while they were kept closed, for example, in neighbouring Italy. The ski touring trend had already been evident before this pandemic (Ernstbrunner et al., 2020). However, against the background of the persisting COVID-19 pandemic, ski touring has gained much more importance, as ski areas remained closed or partly closed. Moreover, tourists frequenting ski resorts throughout the season were missing. The sports industry recorded a fierce drop in sales for classic winter sports (e.g., skiing, tobogganing, ice skating) equipment; in 2020, the decrease was in the high double-digit percentage range compared to the previous year. Interestingly, ski touring equipment sales increased by more than 50% in the same period compared to the

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previous year (FAZ, 2020).

This outdoor recreation activity boom, however, does not contribute to the economic success of ski resorts; on the contrary, ski tourers are beneficiaries of the ski resort infrastructure, especially by ascending and descending groomed slopes without utilising cable cars or paying any monetary compensation (ski tickets etc.) for it (Pröbstl-Haider & Lampl, 2017a). Due to the density of ski resorts—in 2020 there were 208 in Austria—and the expansion of cable cars (Steiger & Scott, 2020) ski tourers find perfect conditions including groomed slopes (also thanks to artificial snow-making infrastructure), which furthermore magnifies the economic scope of this phenomenon. As the popularity of ski touring in the Alps has already strongly increased (Roult et al., 2016), many ski resorts have been facing problems with additional ski tourers occupying parking spaces and directly decreasing turnover through the loss of ticket sales. In addition, the ski touring trend has not remained hidden from tourism, and in some alpine destinations, touristic interests in this kind of outdoor activity have emerged (Pröbstl-Haider & Lampl, 2017a, 2017b). Further problems are that ski tourers might obstruct skiers, destroy freshly groomed slopes during descending after closing time, or disturb snow groomers working with ropes, putting others and themselves at risk (Janssen & Weber, 2012; Österreichischer Alpenverein, 2011). Alpine regions have been trying to get control of this trend in a variety of ways and, above all, to generate economic benefits. Some urban centres (e.g., Innsbruck, Tyrol, Austria) have already responded by offering ski tourers opportunities for evening ski touring in the surrounding ski areas during alternating days of the week with paid parking, which corresponds exactly to the cluster solution addressed by Pröbstl-Haider and Lampl (2017a). By contrast, other ski resorts have closed their slopes to ski tourers to ensure the best possible safety and comfort for their paying clientele comprising alpine skiers.

Although ski touring on groomed slopes has experienced a boom in recent decades, few scientific studies on the topic exist to date (Roult et al., 2016). Current literature has addressed issues such as the health-relevant effects of the ascent (Arbesser et al., 2008; Helmenstein et al., 2007) as well as the risk of injury during skiing (Ruedl et al., 2015). Of particular interest, however, is the motivational structure of people who practise ski touring and the impact of the COVID-19 pandemic on this structure. As Haberfellner et al. (2012) showed, ski touring on groomed slopes often serves as preparation for off-piste tours or, for more experienced people, as a training opportunity. In their survey, nearly half of ski tourers were either beginners or experts in ski touring. As prime motives they mentioned physical activity in natural surroundings and recreation, as well the health-related benefits of the sport. Social motives appeared to be only of marginal importance (Haberfellner et al., 2012). Similar motivational backgrounds have been found in other contributions (Pröbstl, 2012; Pröbstl-Haider & Lampl, 2017a, 2017b). However, we must keep in mind that ski touring presented almost the only opportunity to enjoy ‘skiing’ throughout most of the winter season 2020/21. Taking into account these specific circumstances, this research note aims to gain understanding of whether the motivational background for practising ski touring on groomed slopes changed due to the COVID-19 pandemic and how these changes may be explained.

## 2. Material & methods

The present study utilized a cross-sectional approach to survey ski tourers in the Austrian Alps via an online questionnaire, which was distributed through relevant forums, the Austrian Alpine Association, the Austrian Ski Federation, social media channels of ski resorts, and different Facebook groups on ski-touring. We focused on ski tourers who practised ski touring on groomed slopes and questioned them about their behaviour, namely whether they had done more ski tours (MST) or fewer ski tours (FST) due to the COVID-19 pandemic. Accordingly, they were assigned to the groups MST and FST and considered as a whole population. The survey took place from 1 January to January 31, 2021.

In total, 2051 persons with 44.2% female respondents, a mean age of 38.5 ( $\pm 12.9$ ) years, and an average ski touring experience of 8.0 ( $\pm 8.5$ ) years were surveyed. For further analyses, 1143 participants were assigned to the group MST [female: 45.4%; mean age: 36.0 ( $\pm 12.6$ ) years; min. age: 18 years; max. age: 77 years; ski touring experience: 6.5 ( $\pm 7.3$ ) years] and 928 to FST [female: 43.1%; mean age: 40.9 ( $\pm 13.6$ ) years; min. age: 18 years; max. age: 80 years; ski touring experience: 9.7 ( $\pm 9.5$ ) years].

## 3. Measurements

Sociodemographic data included information about gender, age, level of education, income, occupation, origin, level of physical activity (survey and categorisation according to the Eurobarometer study on sports and physical activity, Eurobarometer, 2018) as well as specific information about the motivational backgrounds of ski touring on groomed slopes. We applied the motive structure utilized by Haberfellner et al. (2012), Pröbstl (2012) as well as Pröbstl-Haider and Lampl (2017a; 2017b). Due to the specific focus on the COVID-19 situation, we added two additional motives: ‘avoiding expensive lift tickets’ and ‘avoiding cable cars in times of the COVID-19 pandemic’. On top of that, we included open questions asking the respondents why they had been doing more, less, or the same extent of ski touring compared to the previous winter. This allowed the participants to give feedback on why and how the COVID-19 pandemic had influenced their ski touring behaviour. Terms with similar meanings (e.g., ‘closed ski lifts’ and ‘closed ski areas’) were merged, and, under the aspect of induction, condensed to a respective maximum of five and ten categories. We used word clouds to represent the importance of a category by its size. In the quantitative questionnaire, respondents were asked to rate the different motives on a 5-point Likert scale ranging from 1 (‘does not correspond at all’) to 5 (‘corresponds exactly’). For the descriptive analysis, we computed proportional frequencies and arithmetic means (MV) with standard deviation (SD). Group differences within the 14 motives as well as ski touring experience and frequency were tested inductively by applying MANOVA. The level of significance was set at  $p < 0.05$ . Effect sizes were expressed as partial eta squared ( $\eta^2$ ) and interpreted according to Cohen’s (1988) guidelines ( $\eta^2 = 0.01$  shows a small,  $\eta^2 = 0.06$  a medium, and  $\eta^2 = 0.14$  a large effect). Statistical analysis was performed with SPSS v. 24.0 (IBM Statistics, IL, United States).

## 4. Results

The analysis revealed descriptive differences in the sociodemographic patterns and the level of physical activity of the groups: Compared to FST, the MST group showed a lower mean age, less ski touring experience, a higher general level of education, a lower percentage of retirees, and a higher level of physical activity (see Table 1 and methods section).

The results of the inductive testing of motivational differences between the FST and MST group are shown in Table 2. The groups significantly differed in nearly all motives; however, effect sizes were close to zero with only two small effect sizes, namely for ‘testing new trends’ as well as ‘avoiding cable cars in times of the COVID-19 pandemic’. The corresponding sociographic characteristics suggested that many respondents had changed their ski touring habits or ventured into ski touring due to pandemic circumstances; however, motivational backgrounds hardly differ.

The analysis of the open questions (see Fig. 1) revealed why the participants had practised ski touring more or less frequently. Among the prime reasons for less ski touring were the protective COVID-19 measures ( $n = 290$ ) and avoiding the accumulation of crowds ( $n = 128$ ) at lift stations, parking areas or popular, highly frequented ski tour routes. Lockdown situations, curfews, and the family environment (home schooling etc.) ( $n = 22$ ) as well as the resulting lack of time ( $n = 47$ ) also contributed to less ski touring. Moreover, trying to avoid any

**Table 1**  
Comparison of FST and MST in terms of selected sociodemographic variables and level of physical activity.

		General (n = 2071)	FST members (n = 928)	MST members (n = 1143)	
		%	%	%	
Level of education	No schooling completed	0.0%	0.0%	0.0%	
	Minimum compulsory schooling	2.2%	1.7%	1.5%	
	Apprenticeship diploma	19.8%	18.8%	15.4%	
	General qualification for university entrance	26.2%	24.7%	30.4%	
	Higher education degree	46.1%	48.7%	49.6%	
	Others	5.2%	6.0%	4.6%	
Occupation	Pupil	0.5%	0.3%	0.3%	
	Apprentice	0.4%	0.4%	0.2%	
	College student	11.3%	8.8%	19.5%	
	Salaried employee	62.1%	62.1%	56.7%	
	Civil servant	7.0%	7.8%	6.3%	
	Self-employed	10.2%	9.4%	10.2%	
	Unemployed/looking for work	1.1%	0.9%	1.7%	
	Retiree	4.7%	7.5%	3.4%	
	Others	2.6%	2.8%	1.8%	
Income	Very difficult to cope	0.7%	1.0%	0.4%	
	Difficult to cope	4.4%	5.1%	4.3%	
	Managing to live	40.4%	41.0%	39.8%	
Frequency of physical activity	Living comfortably	54.6%	53.0%	55.4%	
	5 times a week or more	18.7%	15.8%	20.6%	
	3–4 times a week	44.0%	40.1%	47.4%	
	1–2 times a week	29.8%	33.7%	25.9%	
	1–3 times a month	7.2%	10.1%	6.0%	
Skill level ascent	Less than once a month	0.3%	0.2%	0.1%	
	Never	0.0%	0.0%	0.0%	
	Beginner (ski touring only on easy, well-prepared slopes; without kick turns)	2.0%	8.8%	7.7%	
	Intermediate (ski touring on medium slopes; in moderate conditions; difficulties with kick turns)	17.3%	33.2%	35.1%	
	Advanced (ski touring on advanced slopes; in advanced conditions; no difficulties with kick turns)	61.0%	42.3%	41.9%	
	Expert (mastering demanding kick turns, steep, icy sections without problems)	19.6%	15.6%	15.3%	
	Skill level descent	Beginner (skiing on easy, well-groomed slopes)	6.6%	2.9%	1.7%
		Intermediate (skiing on intermediate slopes in good conditions; difficulties on poorly groomed slopes)	28.9%	21.2%	17.5%
		Advanced (mastering any slope in all conditions)	44.1%	63.0%	57.6%
		Expert (ski instructor, racer ...)	20.4%	13.0%	24.9%

FST = fewer ski tours; MST = more ski tours.

**Table 2**  
Differences in motivation between MST and FST group members.

Motives	Group	MV±SD	p	η <sup>2</sup>
Party in mountain huts	General	2.0 ± 1.2	0.235	0.001
	MST	2.1 ± 1.2		
	FST	2.0 ± 1.2		
Workout after work	General	3.7 ± 1.2	<0.001*	0.007
	MST	3.8 ± 1.2		
	FST	3.5 ± 1.3		
Being outdoors	General	4.4 ± 0.9	0.002*	0.005
	MST	4.5 ± 0.8		
Meeting other people	General	2.3 ± 1.1	0.666	0.000
	MST	2.4 ± 1.1		
	FST	2.4 ± 1.1		
Being out with friends	General	3.9 ± 1.1	<0.001*	0.007
	MST	4.0 ± 1.1		
	FST	3.8 ± 1.2		
Testing new trends	General	2.9 ± 1.4	<0.001*	0.02
	MST	3.2 ± 1.4		
	FST	2.9 ± 1.3		
Recreation	General	4.2 ± 1.0	0.072	0.003
	MST	4.3 ± 0.9		
	FST	4.2 ± 0.9		
Experience of landscape and nature	General	4.3 ± 1.0	0.071	0.002
	MST	4.4 ± 0.9		
	FST	4.4 ± 1.0		
Health benefits	General	4.6 ± 0.7	0.019*	0.003
	MST	4.7 ± 0.6		
	FST	4.6 ± 0.7		
Physical activity	General	4.8 ± 0.6	0.012*	0.003
	MST	4.8 ± 0.5		
	FST	4.8 ± 0.6		
Being active in the mountains	General	4.6 ± 0.7	<0.001*	0.005
	MST	4.7 ± 0.6		
	FST	4.6 ± 0.7		
Training for backcountry ski touring	General	3.7 ± 1.2	0.083	0.001
	MST	3.8 ± 1.1		
	FST	3.8 ± 1.2		
Avoiding expensive lift tickets	General	2.4 ± 1.4	0.335	0.000

(continued on next page)

Table 2 (continued)

Motives	Group	MV±SD	p	η <sup>2</sup>
Avoiding cable cars in times of the COVID-19 pandemic	MST	2.5 ± 1.4	0.017*	0.003
	FST	2.5 ± 1.4		
	General	2.5 ± 1.4		
	MST	2.6 ± 1.5		
	FST	2.7 ± 1.5		
	General	3.1 ± 0.9		
Frequency of ski tours (times a week)	MST	3.3 ± 1.0	<0.001*	0.051
	FST	2.8 ± 0.9		
	General	8.0 ± 8.5		
	MST	6.5 ± 7.3		
	FST	9.7 ± 9.5		
	General	8.0 ± 8.5		
Ski touring experience (years)	MST	6.5 ± 7.3	<0.001*	0.039
	FST	9.7 ± 9.5		
	General	8.0 ± 8.5		
	MST	6.5 ± 7.3		
	FST	9.7 ± 9.5		
	General	8.0 ± 8.5		

FST = fewer ski tours; MST = more ski tours; \* = p < 0.05; MST: n = 1143; FST: n = 928.

possible additional burden on the health system (n = 44) due to ‘unnecessary’ injuries occurring during sports seemed to be a decisive reason for refraining from ski touring. Finally, the snow conditions (n = 28)—too much or too little snow, depending on the location—were a decisive reason for doing fewer ski tours in the pandemic year. Another interesting argument, which is most likely linked to the aforementioned reasons, is the interest in alternative sports (n = 14) such as walking: Taking into account the reasons for avoiding ski touring, other sports became individually appealing in the context of the COVID-19 pandemic. Subjective health (n = 15) in the sense of self-protection was also an important motive for refraining from ski touring on groomed slopes. Instead of ski touring on slopes, some went to the backcountry (n = 58). Likewise, some respondents did only backcountry ski touring in order to be physically active while keeping a safe distance from others.

While some people did fewer ski tours on groomed slopes due to the COVID-19 measures, others did more for the same reason (n = 173). However, the main factor for increasing ski touring activities was the desire to gain new sporting experiences (n = 221). With self-protection (n = 151) by avoiding cable cars and pending crowds of people as another key intention, ski touring as a new outdoor sport where there is no need to worry about the distance to other people was especially attractive. For others, the acquired extra time (n = 160) due to the lockdown regulations in each country were an important reason for increasingly practising ski touring on groomed slopes. Accordingly,

people also used this time bonus for physical activity. Reacting to the increasing demand, some ski resorts offered an extra service and groomed separate slopes for ski tourers; probably, this led to an even stronger increase in ski touring, as respondents found favourable snow (n = 121) conditions.

5. Discussion

The motivational backgrounds of the individual groups (MST & FST) showed significant differences, but only with medium effect sizes. However, the differences are limited to the ski touring experience and the weekly number of ski tours. Taking a closer look at the mean values (Table 2), we see that the individual groups stated relatively similar motives with only minimal differences; though, the motive ‘testing new trends’ showed a significant difference with a small effect size, especially when looking at the mean value of the MST group. In general, the data do not reveal any major differences to previous motive studies (Haberfellner et al., 2012; Pröbstl, 2012; Pröbstl-Haider & Lampl, 2017a, 2017b). Although the COVID-19 pandemic did not seem to have an impact on ski tourers’ motivational background, we assume that the increase in ‘new’ ski tourers can be explained or has at least been accelerated by the COVID-19 pandemic and its restrictions. This is substantiated by the sociodemographic findings, which show that MST group members are younger in age and have less experience in ski touring. Furthermore, qualitative results provided answers to the question as to why the respondents did more or fewer ski tours: Above all, the time factor (due to COVID-19 restrictions and lockdowns, followed by short-time work, etc.) and the closure of ski facilities prompted respondents to increasingly engage in ski touring.

Recent studies have shown an increase in physical activity among previously less active people due to the COVID-19 pandemic (Schnitzer et al., 2020). This phenomenon could also be a reason for the increase in ski touring beginners, especially in alpine regions such as Tyrol. All in all, one could assume that the COVID-19 pandemic has not changed the general motive structure for ski touring, but raised interest in this sport, attracting many beginners. Of course, this growth also poses some problems for ropeway operators. Up to now, parking in ski resorts has usually been free for skiers, since they bought a lift ticket anyway and thus contributed to the economic success. By contrast, ski tourers intend to ascend on the slopes themselves and therefore do not need a lift ticket. Furthermore, cable car operators take great effort to keep the slopes in good condition for holidaymakers or local guests; ski tourers also enjoy these slopes. Consequently, potential conflicts between cable car operators, skiers, and ski tourers emerge. Thus, the main task for the future might be finding ways of dealing with the increased interest in ski touring that satisfy all stakeholders, especially ski tourers on the one and cable car companies as enterprises that pursue economic interests on the other side.

This study also has some limitations, above all the geographically

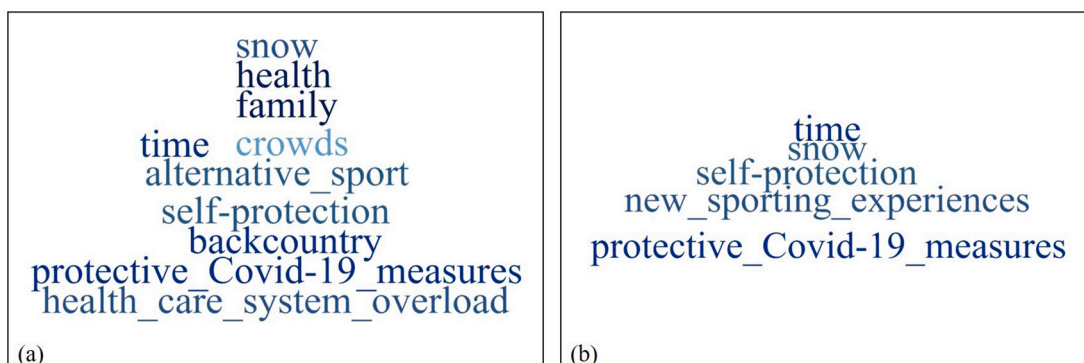


Fig. 1. Reasons for (a) practising ski touring less and (b) more ski touring due to the COVID-19 pandemic.

limited approach: It allows deductions only for alpine regions. Moreover, the respective local restrictions have to be considered. Since Tyrol was a centre of momentum in the European spread of COVID-19, strict restrictions were imposed and implemented in a timely manner (lock-down); however, the restrictions did not apply to other alpine regions in the same manner, resulting in argumentation difficulties at the regional level.

Nevertheless, due to the high number of people surveyed the study provides a very precise overview of the current motive structure in relation to ski touring and can be regarded as the most comprehensive and up-to-date study of motives for ski touring. Managerial implications go hand in hand with the research outlook: Future studies could provide a closer look at the conflict potential emanating from ski touring on groomed slopes and suggest possible countermeasures such as guidance systems, utilisation fees for ski tourers, or parking fees (Pröbstl-Haider & Lampl, 2017a, 2017b). In addition, scientific research should also shed light on possible future scenarios that include the clientele and developments in the ropeway industry in order to derive information relevant to practice. Of course, the willingness to pay for ski touring tickets or other measures for ski touring on groomed slopes could also be the subject of future research interests. A geographical approach, focused on the place of residence of ski tourers, could provide conclusive information on visitor flows; furthermore, tourism-related interests (for destination management organisations) could be derived. The authors, therefore, encourage researchers to continue examining the specific motivational structures of sport in tourism contexts (Kirkup & Sutherland, 2017). Finally, the present data set allows further processing for a much more detailed evaluation, which takes into account possible influencing factors as well as possible conflict potentials and willingness to pay of this specific group.

#### CRedit authorship contribution statement

**Philipp Schlemmer:** Conceptualization, Methodology, Validation, Formal analysis, Writing – original draft, Writing – review & editing, Project administration. **Martin Schnitzer:** Conceptualization, Methodology, Validation, Investigation, Writing – original draft, Writing – review & editing, Project administration.

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