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## Rethinking growth orientation: Do ski-resorts' strategies fit the profiles of today's alpine skiers?

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The strategy and marketing of ski resorts in the European Alps are still characterized by growth orientation and the extension of technical snow production to ensure high snow reliability. In contrast, this study hypothesizes that besides a high-performing ski resort, winter ski vacationists have further expectations for activities during their stay varying by their skiing skill level and personal preferences. The present study surveys 1413 Alpine ski tourists to identify their daily routines, activities, and used ski resort services. The findings uncover significant differences in the activity profiles with six clearly distinguishable guest segments. The results highlight the need for custom-tailored product development considering the complete set of winter experiences as well as pricing strategies that specifically target the identified segments. Furthermore, the findings underline that ski resort and destination managers need to include daily changes in snow and weather conditions in their strategies considering climate and demographic change.

climate change, crowding, pricing, skier segmentation, snow quality, winter vacation

## 1 | INTRODUCTION

The international ski market includes about 135 million skiers worldwide, generating about 350 million skier visits in approximately 100 countries—primarily within Europe, North America, and Japan (Vanat, 2022). While skiing continues to grow in Eastern Europe and Southeast Asia, the markets in Europe, North America, and Japan have matured, and participation levels have stabilized or partly declined. Therefore, the annual growth rate of winter overnight stays in the European Alps has slowed down over the last decades. Steiger et al. (2021) report a decline for Austria from 3.1% in the 1980s to 1.5% in the last decade. However, the dependence on winter tourism in the region has hardly changed. In many regions of the Alps, winter tourism is responsible for almost half of annual overnight stays (ASTAT, 2023). Recent trends show an increasing diversity during the winter season (Bausch & Unseld, 2018) which might

address the positive economic effects of tourism market and tourism activity diversification as shown by Solarin et al. (2023). This includes interest in skiing, ski touring (Schlemmer & Schnitzer, 2021), health and wellness treatments, events and concerts (Obradović & Tešin, 2023), city trips, or Christmas market tours (Brida et al., 2017). Therefore, the type and economic role of winter tourism can show considerable regional differences. Nevertheless, in the higher reaches of the Alps and its side valleys, ski vacation is the most important and dominant product (see e.g., Martini et al., 2019 for Italy; Steiger et al., 2021 for Austria). In these regions, the tourism value added in winter is still far above the achievable values in summer, and successful winter ski seasons are needed for ensuring the survival of the tourism industry (Swiss Tourism Federation, 2020; Tirol Werbung, 2022).

In the last 20 years the competition between the Alpine ski destinations increased significantly due to a stagnation or decline of skiers

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in traditional large source markets, such as Germany, the Benelux countries, or Great Britain. The decline of these markets had to be compensated by skiers from growing markets, especially from the eastern European countries (Vanat, 2022). Switzerland even tries to attract guests from Asia (Haller Rupf et al., 2019). Therefore, the understanding of destination choice among the competing Alpine winter destinations is key for future product development. Theories about destination choice in general and its modeling are well represented in tourism research (see e.g., Pandey and Joshi (2021) analyzing more than 600 respective publications). Common to all models and theories is the role of pretravel expectations of tourists in the destination choice process (Sirakaya & Woodside, 2005). With this background, consumers compare and rate alternatives along a list of multiple criteria (Decrop, 2010) which reflect travelers' expectations formed by a process over time, and influenced by their personality and living conditions (Desforges, 2000). Following the logic of markets where supply and demand converge, destination competitiveness depends on the level of fit between the expectations of consumers (here, the travelers)—and the destination attributes (Crouch, 2011). Until today, the strategies of most ski resorts were based on two pillars: growth to reach better profitability for the resorts (Falk & Steiger, 2020) and snow reliability by technical snow production (Scott et al., 2022). However, the overall winter tourism market, including warm destinations as alternatives, has changed (Bausch & Gartner, 2020). This may also influence the expectations of guests and their destination choice.

A sound and updated knowledge of the expectation patterns of travelers with an interest in a specific class of travel products is therefore essential for destination managers. This leads to the question of what is known about the expectations of skiers and snowboarders visiting or intending to visit the Alps during the winter season. While existing research in the field of ski tourism mainly was focusing on the ski resorts, skiing related activities and management issues of the suppliers this article widens the perspective by looking at the demand side: the winter vacationists in alpine destinations offering skiing as main product among many other activities for the guests. Supposing, that today most of the large ski resorts offer a highly comparable core product for skiing with large compound slope systems, snow reliability by artificial snow production and modern high-capacity cable cars, the guests' satisfaction with their overall vacation experience becomes a key factor for competitiveness. As a novelty, this study creates a typology of guests' activity profiles by looking at the entire set of guests' activities, which provides a basis for winter destinations for their future positioning and product development. The study will discuss these results in the context of major external long-term drivers such as demographic or climate change.

## 2 | LITERATURE REVIEW

### 2.1 | Destination choice in winter tourism

Analyzing recent literature about Alpine winter tourism, two main groups of publications appear: first, studies addressing the supply side

and second, studies focusing on the travelers representing the demand side. The recent discussion about the supply side had a strong focus on the impact of climate change on ski resorts. Steiger and Abegg (2018) give an overview of the situation in the eastern Alps and show the possibilities and limitations of artificial snowmaking as an adaptation strategy. For the Aosta valley in the south-western Alps, Joly and Ungureanu (2018) show the need for investments in snowmaking infrastructure and the related effects on the profitability of the ropeway companies. This is confirmed by Berard-Chenu et al. (2022) and contrasted by the argument that the specialization in the ski tourism industry does not only create higher competitiveness but also limitations for alternative adaptation paths. Ballotta et al. (2020) underline the increasing inconsistency of the alpine winter climate with the risk of late or no snowfall as well as an early ending of the season. They propose risk management strategies including hedging against the hazards of climate impact.

Further studies addressing climate change discuss skiing resorts in other European areas, for example, Norway (Scott et al., 2020), Sweden (Demiroglu et al., 2020; Rice et al., 2022), Slovakia (Gajdošíková et al., 2019) or Spain (Sauri & Llurdés, 2020) and highlight similar challenges. The risk of technical snow production as a maladaptation was first discussed by Hopkins (2014), considering a potential lack of acceptance of this technology by the consumers and the local community in Queensland, New Zealand. Scott et al. (2022) shows the place-context specific risks of snowmaking and the likelihood for maladaptation in the US ski market. Steiger, Knowles, et al. (2022) in a review, give a detailed overview of publications discussing the impacts of and reactions to climate change in mountain tourism. The approach found in many of these publications has a strong link to the factors technology progress and technology efficiency, labor input effect and capital input effect, which were shown to stimulate in general tourism growth by Zha et al. (2020).

Climate change is also a major issue in publications discussing the demand side of Alpine winter tourism during the last few years. There, the reaction of winter mountain tourists to climate change is broadly analyzed. With Prettenthaler et al. (2022) modeling the tourists' responses to a lack of snow reliability for 71 European regions and showed the potential impact in terms of losing or winning overnight stays in three scenarios. Steiger, Posch, et al. (2022) demonstrate how demand for Austrian ski resorts will change due to the effects of climate change on snow conditions, which are the most important destination attributes for ski tourists. A further aspect of climate change on the demand side was analyzed by Chen et al. (2020). They showed the concern of skiers about climate change and its proximate effect on mitigation behavior in daily life. Based on a survey at two German winter destinations, Witting et al. (2021) add as a result that the reactions not only depend on snow reliability but also on the individual sociodemographic profile and lifestyle of the guests. This supports the results of a qualitative study by Bausch and Unseld (2018) and a quantitative follow-up study by Bausch and Gartner (2020) who showed that the market of alpine winter tourism can be segmented into a set of guest groups, for some of which alpine skiing plays a minor role or no role at all.

## 2.2 | Factors influencing guests' satisfaction

Within the block of publications analyzing nonclimate change related aspects of the demand side for Alpine winter destinations, a subset of it focuses on destination perception and preferences. Factors influencing guests' satisfaction are analyzed by Hallmann et al. (2014), He and Luo (2020), Matzler et al. (2021), and Miragaia and Martins (2015). Hallmann et al. (2014) take a more holistic perspective and reveal, that general destination features, such as accessibility, infrastructure, accommodation, or possibilities for winter-related activities are dominant. Matzler et al. (2021) confirm the general role of ski peripherals and link them to Value-for-Money. They identify dissatisfaction with the attribute Value-for-Money as a trigger for temporal changes of the ski resort. Bichler and Pikkemaat (2021) investigate urban winter destinations and show their potential for skier groups. They identify a specific activity and interest profile of some guest groups, which cannot be covered by rural destinations. Fredman and Chekalina (2019) highlight an increasing influence of work patterns, lifestyle, value change, and the available income on winter tourism in Sweden. They also perceive an activity diversification and decrease in destination loyalty for the Swedish ski resorts.

## 2.3 | Influence of pricing strategies

The group of publications dealing with pricing strategies of ski resorts and particularly ski passes link the perspectives of demand and supply (Alnes et al., 2021; Malasevska, 2018; Malasevska & Haugom, 2018). Weather conditions have been identified as an important potential factor for ski pass pricing by Malasevska et al. (2017) and Haugom and Malasevska (2019). They propose weather-dependent pricing to readjust the Value-for-Money. Beyazit and Koc (2010) proposed pricing strategies for accommodation in Turkish ski resorts introducing the snow level as a factor. The presented model calculates accommodation prices starting from a low level during periods of low density up to prices for high snow density and therefore guaranteed premium conditions for visitors. Steiger et al. (2020) made a similar recommendation to use dynamic pricing to compensate for lower snow quality. However, a recent publication by Pröbstl-Haider and Flaig (2019), analyzing different pricing concepts in Europe and North America, presents different findings. The authors conclude that pricing in winter ski tourism should consider the external competition, include a year-round perspective, and develop a pricing system in close cooperation within the tourism destination. The authors ask for a shift toward lifestyle and experience orientation, focusing more on consumer loyalty and capacity utilization as the main indicators of a healthy business.

## 2.4 | Understanding the demand side

Demand-oriented studies address the segmentation of ski tourists to create a more detailed picture of the structure of the skier market.

Alexandris et al. (2009) investigate the motivations of skiers in a Greek ski resort, Konu et al. (2011) cluster Finnish ski resort guests according to destination choice attributes. However, these approaches did not examine the behavior of tourists within the destination nor differentiate between skier profiles, which was shown to have a significant influence on preferences (Jacobsen et al., 2008).

Three studies from the USA and Canada analyzed the potential reactions of skiers to a lack of snow or later season opening (Dawson et al., 2013; Dawson & Scott, 2013; Rutty et al., 2017). They showed that more engaged skiers have a higher willingness to take longer rides to more distant ski resorts and therefore show geographical flexibility as well as shifting the period of their skiing activities. While lower-engaged skiers with a higher probability, will decline the offer. Two demand-side focused studies show that satisfaction is negatively affected by perceived crowding, which varies for different skier socio-demographic groups (Zehrer & Raich, 2016) and those with different skill levels (Pikkemaat et al., 2020). Based on a choice experiment Pröbstl-Haider and Mostegl (2019) studied the preferences and intended behavior for a ski resort in South Tyrol by potential winter tourists from Italy, Germany, and Austria. Regarding the main motivations, preferences, and destination choices the authors found significant differences among the tourists from the three countries. These cultural differences are important for tailored marketing strategies. Abegg et al. (2019) perceived an increasing amount of so-called "alternative" outdoor activities in Alpine winter tourism for the case of Tyrol. They state that it will be paramount and serviceable for the destinations to consider whether their guests are looking for quietness, health improvement, or physical achievement.

On a basis of 35 destination attributes, Evren and Kozak (2018) analyzed their importance level in general and the ranking of five Turkish ski resorts. They showed the relative position of each resort in relation to the attributes. The study revealed the partial divergence between the perspective of the demand side and the positioning by the resorts' management.

## 2.5 | Main research questions

This review revealed a general tendency of focusing on very specific aspects of the skiing tourism sector. Many of them were case study-based and gave useful insights into specific regional differences or could help to show the need for more general research. One research gap we detected is skiers' general vacation profiles and related activities during winter ski holidays in an Alpine destination.

We hypothesize that a closer look at all components of a winter ski vacation, the skiing on the one side and other nonskiing related activities in the destination on the other is needed to understand the overall guest profiles for a winter vacation and achieve a comprehensive understanding of the demand. For the skiing side skiers' skill levels, used skiing-related services and the linked preferences of ski-pass type selection, skiing activities under different weather conditions, and start and length of a skiing day will give a clearer picture of this group of tourists. The nonskiing related activities as

**TABLE 1** Structure of final sample after completeness and consistency check.

Cases by country		Region			
Italy	684	Northern Italy	62.7%	Other Italy	37.3%
Germany	729	Southern Germany	64.9%	Other Germany	35.1%
Gender		Children under 14 years in household			
Male	50.0%	Yes	37.4%		
Female	50.0%	No	62.6%		
Age group		Monthly net household income			
18–29	22.9%	Below 2000 Euro	16.1%		
30–44	27.1%	2001–4000 Euro	47.1%		
45–59	26.5%	4001–6000 Euro	25.1%		
60+	23.4%	6001 and more Euro	11.7%		

the second element are linked to each winter destinations further attractions and services. Based on the expectation and activity profiles of the identified segments, we finally discuss options of alternative product development and pricing strategies for Alpine destination managers and ski resort marketing managers considering the impacts of climate change.

### 3 | METHODOLOGY

This study is based on a survey with 1413 participants in the largest northern Alpine market (Germany  $n = 729$ ) and the largest southern Alpine market (Italy  $n = 684$ ). After a soft-launch with 83 participants by which the functionality and comprehensibility of the questionnaire was tested the main field phase took place between 5th and 14th of December 2022 as part of a larger study examining the attitudes and intentions of skiers for having a winter ski holiday trip in the winter season 2022/2023. The study participants were recruited using online panels in Germany and Italy from NORSTAT, a professional provider (see [www.norstatpanel.com](http://www.norstatpanel.com)). Participants were selected using quota-sampling, considering gender, age groups, duration of last ski vacation, and regional distribution by country to obtain a well-balanced sample. Furthermore, participants needed to have had at least one ski vacation in the Alps within the past 4 years. After a check for data completeness and consistency using descriptive statistics, 1413 cases could be kept for further analysis. Table 1 shows the structure of the final dataset. SPSS 28 was used for all steps of data analysis.

For the scope of this article, we group the activities Alpine skiing and snowboarding on groomed slopes in ski resorts under the term “skiing” and use “skiers” as term for people practicing these sports in the analysis part.

This study addresses the following aspects:

1. Personal skier profile and expectations for activities and services when having a ski vacation,
2. Details about the last ski vacation including activities and used services,

Intentions for going on ski vacation in the season 2022/2023 and planned use of services and activities during vacation. The questionnaire was designed by using former studies with three main sections: individual skier profile, use of skiing related services, and general activity profile during a winter vacation.

In the first section, we gathered data describing the personal skier profile. We asked the participants three blocks of questions. First, they had to rate their skill in analogy to the slope marking system: blue for beginner, red for advanced, and black for expert. As weather conditions have a significant impact on the number of sold tickets (Shih et al., 2009) a second question was introduced asking under which weather conditions the participants went skiing (every day in all weathers, on days with good weather/good visibility, on selected days with nice weather, but I sometimes also take a break on such days). Furthermore, knowing about personal priorities of starting and ending the ski day from dynamic pricing models (Malasevska et al., 2020) a third question about the beginning and the end of a ski day was added as well as the preferred type of ski-pass (multiday ski pass, day tickets, depending on the weather, either day or half-day tickets (morning or afternoon), half-day tickets (morning or afternoon)).

To which extend winter holiday guests make use of typical services provided by ski resorts is a further important aspect to characterize winter vacation guests and was addressed in the second section of the questionnaire. We asked for the importance (“not important at all” to “very important”) and the level of usage during the last skiing vacation (“never” to “every day”) of the most common services typically provided by large ski resorts. We used the most frequently reported services of ski resorts in the 2022 report of Vanat (2022). Participants could report if they used services ski/snowboard equipment rental, locker rental and ski/snowboard school. To families with children, the additional options for kids ski/snowboard school and kindergarten were offered.

The third section of the questionnaire was addressing the general activities of winter vacation guests besides skiing in the ski resort. Bausch and Gartner (2020) showed, that a winter vacation at an Alpine destination does not only attract guests who visit it primarily for skiing. They identified a broad set of additional winter activities relevant during a stay, for example, winter hiking, using a sledge or

**TABLE 2** Skiing skill level by gender, age group, and country (in % per column).

Skill level	Gender		Age-group				Country	
	Male	Female	18–29	30–44	45–59	60+	DE	IT
Beginner	25.9	36.1	34.6	32.1	30.4	26.9	17.8	45.0
Advanced	63.4	56.7	56.8	55.9	63.5	64.0	66.7	52.9
Excellent	10.7	7.2	8.6	12.0	6.1	9.1	15.5	2.0
Sig. chi-square	<0.001		0.030				<0.001	

just enjoying a shopping tour in the mountain village center. As such, we used the most popular activities for winter guests as identified in this study (Bausch & Gartner, 2020). Additionally, socio-demographic data of participants (see Table 1) were collected.

As a first step of analysis, we took a closer look at potential differences between the groups of study participants having different skiing skill levels. To identify significant differences in importance between activities and used services, one-way ANOVA was applied. Considering the destination choice process as described initially, a segmentation based on only one variable, for example, the skill level variable must be seen critically. To find groups with similar ski vacation preferences, the skiers' individual activities, skiing profiles, and service expectations should be considered. Therefore, a segmentation was derived using factor (PCA) and varimax rotation. Frequent or daily activities and frequently or daily used services from Table 4 were used as activities input variables. In describing the skiing profiles, the weather-dependent skiing behavior, preferred ski pass type, starting time of skiing under good weather conditions, and the duration of the ski day were used. Subsequently, a cluster analysis was done based on the derived factor scores of the PCA solutions. As cluster analysis algorithms heuristics, hierarchical (complete linkage, centroid and Ward based on squared Euclidian distance) as well as exchange (*k*-means) algorithms were applied. Comparing the different results and finally using the elbow-criterion for hierarchical clustering, a six-cluster solution was identified to deliver very homogenous results concerning the size and centroids of the clusters. These clusters were then described with the original input variables used for factor analysis and additionally a few descriptive socio-demographic variables.

## 4 | RESULTS

### 4.1 | Influence of the skill level on behavior and demand

As the focus of the study was to create a better understanding of expectations, related activities, and used services of skiers, a first look was taken at the differences in the skill level of the skiers. We found significant differences ( $\alpha = 0.05$ ) by gender, age group, and country (see Table 2). Women and Italians show a higher proportion of beginners while more German participants self-assess to be excellent skiers. The share of beginners decreases steadily for the higher age groups. A potential explanation could be that the youngest age group has a

higher share of early-stage beginners, while in the age group 60+ a part of the people with lower skill levels might have stopped skiing or advanced their skills over the years and are therefore not part of the sample. In total, 60% chose the skiing level “advanced.” The proportion of skiers who see themselves as “excellent” is relatively low at 9%.

Looking at the preferred weather conditions for skiing (see Table 3) we see a strong link between skill level and preferences. Many beginners and advanced skiers tend to skip days with bad weather and limited visibility. Only in the group of excellent skiers that most ski under all kinds of weather conditions. A further comparison of gender and age groups did not show any significant differences: excellent skiers behave widely in a homogenous way. Furthermore, the preference for ski passes is also correlated with skill level. For excellent skiers, multiday ski passes are clearly the first choice (81.1%), while more than half of beginners select single- or half-day tickets.

The results show some significant differences among the three-skill level groups using one-way ANOVA. The rental services and ski schools are of higher importance for beginners than for other skill levels. Less than half of the excellent skiers rented equipment during their last stay, while three of four beginners used this service. Ski schools are used more frequently by beginners (46.1% frequently or every day) and excellent skiers (39.4%) than by advanced skiers (27.4%). This is in line with anecdotal observations from traditional ski resorts, such as Arlberg (AT), Davos-Klosters (CH), or Ischgl-Samnaun (AT/CH), where excellent skiers frequently join a guided group of guests at the same skill level for the socializing effect and to have joint experiences with some sportive competition. This socializing aspect also becomes visible in the activity profiles: excellent skiers more frequently joined apres-ski and nightlife (55.9% frequently or every day). No significant differences could be found for food and beverages in restaurants in the ski area.

Of the further activities, beginners mostly give high ratings, especially for moderately active or relaxing activities, such as hiking, thermal spa visits or shopping in town. In contrast, activities with a more sportive profile like snowshoeing, cross-country skiing or sledging are of higher importance for excellent skiers. In many cases, the group of advanced skiers makes less use of these activities than the other two groups. Most of the ratings in Table 4 related to services and activities and the importance of their availability and their concrete use during the last stay show values above 40%, many even above 60%. This presupposes that for most guests, Alpine ski winter vacations are a combination of activities around the core activity: skiing.



**TABLE 3** Skiing skill level (columns), weather conditions (% per row), and preferred ski pass type (% per row).

		Beginner	Advanced	Excellent	Sig. Chi-square
	Share of skill-level in sample (in% column)	31.0	60.0	9.0	-
I am skiing...	Every day in all weathers	23.5	47.9	76.4	<0.001
	On days with good weather/good visibility	61.4	42.3	16.5	
	On selected days with nice weather, but I sometimes also take a break on such days	15.1	9.8	7.1	
My preferred ski pass type...	Multi-day ski pass (from first to last day of skiing)	42.5	61.6	81.1	<0.001
	Day tickets	24.9	18.3	9.4	
	Depending on the weather, either day tickets or half-day tickets (morning or afternoon)	25.6	16.7	7.9	
	Half-day tickets (morning or afternoon)	7.1	3.4	1.6	

Taking a closer look at children-related services, only those participants who stated that the service of ski/snowboard school for kids or a ski kindergarten is of interest to them were analyzed. First, the high share of people who indicate a general relevance of these services is astonishing (see Table 5). Especially in the group of beginners and advanced skiers, many like to have these services available. But only about 50% rate these services as important or very important for them. Thus, it should be seen as an option and not as a prerequisite for a satisfying stay. When looking at the number of skiers who used these services during their last ski vacation, the excellent skiers stand out: within the group that rated the service as relevant, 80% and more used it. This suggests that excellent skiers not only want professional skiing education for their children but also want to use a part of the day to ski themselves.

This very individual and multioptional setting of a perfect skiing day needs time management, which allows the combination of several activities. The participants were asked: “on a day with good weather for skiing, when do you usually start and when do you finish your ski day?” Table 6 shows the split of starting and ending times by skill level of the skiers. A clear pattern becomes visible: beginners rarely start at the earliest possible time and rarely ski as long as possible. With increasing skills, the share of longer skiing days grows. Excellent skiers love to start early, and many keep skiing for as long as the lifts run.

We analyzed the preferred time window during a good weather ski day by skill level (see Figure 1). Nearly half (45.0%) of the beginners either ski from 9:30 or 10:30 until 2 or 3 o'clock. A 30.4% already finish their ski day around 1 o'clock or earlier. The same period (between 9:30–10:30 and 2–3 o'clock) is favored by many of the advanced skiers (42.4%). However, only a few (12.4%) are finishing their ski day already around noon (1 o'clock or earlier). More than half (53.5%) of the excellent skiers either use the maximum available time (40.9%) or ski as long as possible when starting around 9:30 (12.6%). The overall picture for all skiers shows that even on a day with good weather a large share of skiers stop skiing around noon or early afternoon. This underpins the importance of additional options for activities in the afternoon. Moreover, it explains the high number of beginners hiking frequently or daily during their ski vacation.

## 4.2 | Segmentation

First, using principal component and varimax rotation analysis, four independent main factors as the basis for individual vacation settings could be found. A Kaiser–Meyer–Olink measure of sampling adequacy of 0.869 was clearly above the 0.8 threshold indicating good data quality. Furthermore, Bartlett's Test of sphericity with a significance below 0.001 confirmed that the sample and the selected variables could be used for factor analysis. Frequent or daily activities and frequently or daily used services from Table 4 were used as input variables. To describe the skiing profiles, the weather-dependent skiing behavior, preferred ski pass type, starting time of skiing under good weather conditions, and the duration of the ski day were used. For most variables the communalities were above 0.50 and went up to 0.71. For three of them, these ranged between 0.47 and 0.49. Table 7 shows the factor loadings of the rotated component matrix and the four factors found using the criterion of cutting the number of factors at the level of an eigenvalue of 1.0. The interpretation of the identified factors is consistently possible. The first factor loads high on further physical outdoor activities and visiting a thermal spa. The second is generated by all variables characterizing the skiers' profiles. The third merges the skiing-related services typically offered by ski resorts. The last factor loads high on the further activities, which also have a socializing component, as these frequently are group activities.

The four factors which are orthogonal and have an identical score weight for each factor, were subsequently used for cluster analysis. As cluster analysis algorithms heuristics, hierarchical (complete linkage, centroid, and Ward based on squared Euclidian distance) and exchange (*k*-means) algorithms were applied. Comparing the different results and finally using the elbow-criterion for hierarchical clustering, a six-cluster solution was identified to deliver very homogenous results concerning the size and centroids of the clusters. These clusters were then described with the original input variables used for factor analysis and additionally a few descriptive socio-demographic variables. Table 8 shows the structure of the segments compared.

**TABLE 4** Skiing skill level (columns), importance and use of services/activities (% importance important and very important/% during stay frequently or daily).

Importance	Beginner	Advanced	Excellent	Sig. ANOVA
Importance of availability of services (important and very important %)				
Ski/snowboard equipment rental	78.8	63.6	60.6	<0.001
Ski/snowboard locker rental	62.6	49.1	56.7	<0.001
Ski/snowboard school	59.6	45.6	44.1	<0.001
Stop in ski area in huts for food and drink	78.1	82.1	82.7	0.196
Importance of availability of activities (important and very important %)				
Winter hiking	67.8	59.1	52.0	<0.001
Snowshoeing	47.7	42.3	44.9	0.182
Cross-country skiing	45.9	42.9	48.8	0.342
Sledging	44.5	40.7	51.2	0.057
Visit of thermal spa	60.5	52.9	52.8	0.03
Après-ski and nightlife	46.6	46.6	53.5	0.325
Shopping in town	58.0	51.3	48.0	0.036
Use during last ski vacation	Beginner	Advanced	Excellent	Sig. ANOVA
Services used during last stay (frequently or every day %)				
Ski/snowboard equipment rental	74.0	52.8	48.0	<0.001
Ski/snowboard locker rental	51.1	37.9	49.6	<0.001
Ski/snowboard school	46.1	27.4	39.4	<0.001
Stop in ski area in huts for food and drink	80.4	85.0	85.0	0.092
Activities shared during last stay (frequently or every day %)				
Winter hiking	53.2	44.7	47.2	0.015
Snowshoeing	32.9	25.7	37.8	0.002
Cross-country skiing	35.2	34.1	43.3	0.127
Sledging	36.3	30.5	40.9	0.018
Visit of thermal spa	44.1	37.9	46.5	0.036
Après-ski and nightlife	39.5	48.3	55.9	<0.001
Shopping in town	58.4	51.1	49.6	0.029

The segments can be characterized as follows:

- S1 Relaxing fair-weather skiers (15.3%): about two-thirds are beginners, the other third are advanced skiers, and many use rental equipment. They exclusively ski on days with good weather, but even not on all these days. On average, they ski only 4 h a day and therefore prefer a single- and half-day tickets. Relaxing in thermal spas or hiking are important additional activities. They love stops on mountain huts during or shopping and après ski after skiing. The share of Italian skiers in this group is above average (seven of ten).
- S2 Active fair-weather skiers (14.4%): the majority have advanced skills; the others are beginners and most only ski in case of good weather for 4.6 h. Therefore, single- and half-day tickets are preferred. Besides skiing, the group loves other physical activities such as hiking (more than half), cross-country skiing (two of five) and snowshoeing (more than a quarter). Services offered by the resorts are only partially used. Social activities are of low importance.
- S3 Service-oriented skiers (15.9%): most are beginners, all others advanced skiers, half/half ski every day or in case of good weather

respectively. Nearly all rent equipment, most book a locker as well, and half book a ski school. The focus is on skiing including stops in a mountain hut, but with a moderate daily skiing duration of 5 h. However, multiday ski passes are preferred. Besides skiing other activities are of lower interest. Between one third and a quarter engage additionally in hiking, sledging, or shopping. This segment has the highest share of women.

- S4 Enthusiastic skiers (19.5%): most are advanced or even excellent skiers. Every day they ski for an average of 6.5 h, regardless of weather conditions. Therefore, nearly all buy multiday ski passes. Most use their own equipment and rarely book skiing-related services. Further activities are not of interest except a stop at a mountain hut during the ski day. Most have higher household incomes at their disposal, only a few have children, and an above-average share comes from Germany.
- S5 Fun seekers (14.9%): love to stop on mountain huts, après-ski, nightlife, and shopping. Almost all are advanced skiers, more than a third ski every day while more than half decide depending on weather conditions. Therefore, the preferred ski pass type splits into half multiday and the other, single- or half-day

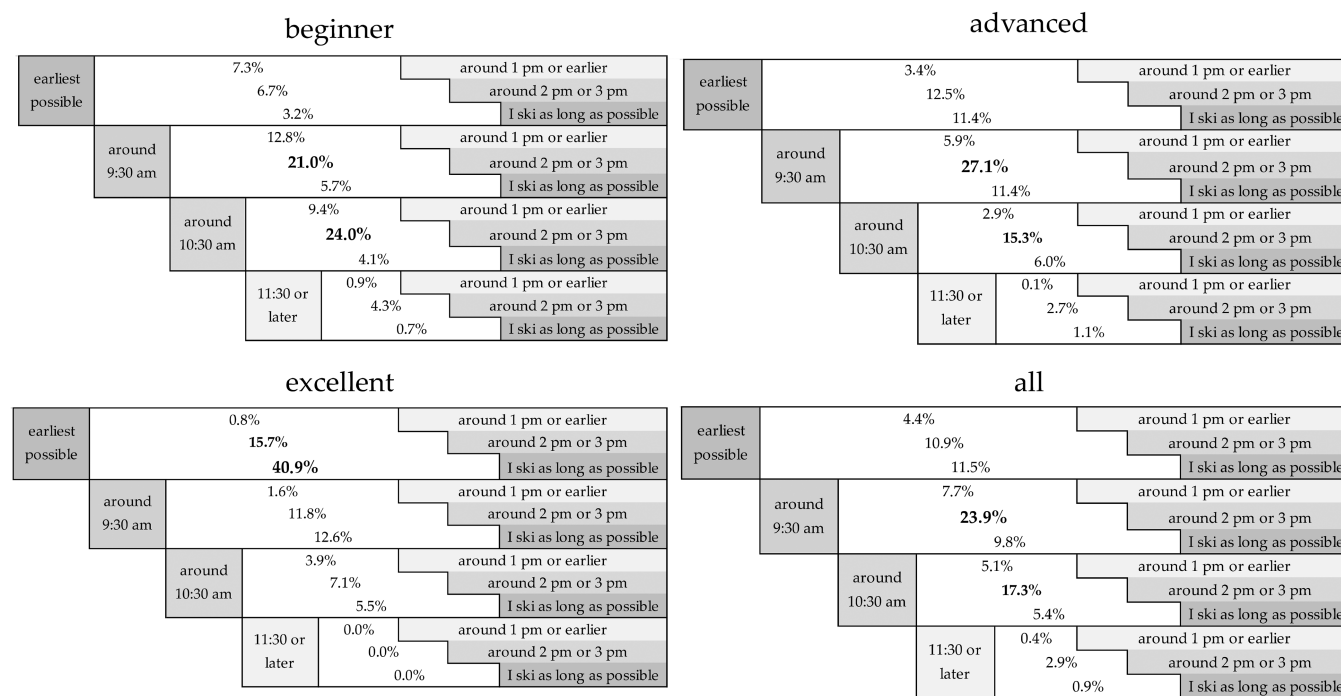


	Beginner	Advanced	Excellent	Sig.
Service in general relevant for me in %				
Ski/snowboard school for kids	80.9	76.1	59.0	<0.001
Ski kindergarten	74.3	69.8	55.1	<0.001
Service important or very important within group of skiers to whom the service has a relevance				
Ski/snowboard school for kids	47.7	46.2	44.9	<0.001
Ski kindergarten	36.4	31.5	40.2	<0.001
Service frequently or daily used by skiers to whom services are in general relevant in %				
Ski/snowboard school for kids	44.8	57.0	84.0	<0.001
Ski kindergarten	32.4	39.9	80.0	<0.001

**TABLE 5** Skiing skill level (columns), importance, and use of children-related services.

**TABLE 6** Start and end of ski day if good weather conditions by skill level.

Start of ski day	Beginner	Advanced	Excellent	End of ski day	Beginner	Advanced	Excellent
Earliest possible	17.1	27.4	57.5	Before 12 o'clock	9.4	3.7	0.8
Around 9:30	39.5	44.5	26.0	Around 1 o'clock	21.0	8.7	5.5
Around 10:30	37.4	24.3	16.5	Around 2 o'clock	22.6	19.6	6.3
Around 11:30	3.9	3.3	0.0	Around 3 o'clock	33.3	38.1	28.3
From 12:30	2.1	0.6	0.0	I ski as long as possible	13.7	30.0	59.1



**FIGURE 1** Distribution of start and end time preferences of ski days by skill level.

passes. Half of the group hikes or visits a thermal spa, while the ski-related services are hardly used at all. Persons without children, at an age above 44, and from Germany are slightly overrepresented.

S6 Family skiers (20.1%): all kinds of physical and social activities are used frequently or daily to create a multifaceted winter vacation. All offered services are used here. Half of them go skiing

every day while the other half decide according to the weather. The skill level is an average mix with a slightly higher share of excellent skiers. The preferred ski pass type is multiday, for an average of 5 h skiing per day. The group is younger and family-oriented: two-thirds in the group are between 18 and 44 years old, and two-thirds in the group have children under the age of 14.

**TABLE 7** Results of factor analysis (PCA—varimax rotation—only factor loadings with value above 0.33).

Variables used in PCA	Factors of rotated component matrix			
	1	2	3	4
Eigenvalue	4.12	2.06	1.11	1.06
Description	Activities	Skiing profile	Services	Socializing
Snowshoeing	0.76			
Hiking	0.71			
Cross country	0.67			
Sledge	0.65			
Thermal spa	0.64			
Usually skiing by weather		0.75		
Ski pass preferred		0.74		
Duration of skiing day in hours		0.70		
Skill level of skiing/snowboarding		0.55		
Equipment rental			0.76	
Locker rental			0.58	
Ski school			0.57	
Stop in mountain huts				0.79
Apres-ski and nightlife				0.59
Shopping				0.53

Even though segmentations should never be seen as an absolute, the results underline that the market of skiers must be considered and treated in a highly differentiated way.

## 5 | DISCUSSION

The findings of this study are based on a segmentation of the full-day activities profile of winter ski vacationists and show the importance of the holistic view of the destination—its attractions, and the provided services. The following discussion will address four main aspects: the ski resorts' development strategies, the role of climate change, target-group oriented pricing, and the role of guests' activity options complementary to skiing.

### 5.1 | Growth-oriented versus target group-oriented strategies

The management of many Alpine ski resorts responded to the new competitive situation by merging with adjacent resorts to larger areas, which brings along two major advantages. On the one hand, their strategy could claim the argument of a larger area with more slopes, higher located areas, and an increased variety of skiing options for guests in the new composite area. On the other hand, they could use scaling effects to reach higher profitability (Falk & Steiger, 2020; Moreno-Gené et al., 2018). Currently, marketing managers are trying to outshine other alpine ski areas focusing mainly on the size of their ski resort. Superlatives in promotion were supposed to attract new guests or bring back visitors lost to competitors in the past. This raises

the question of whether these superlatives can attract more skiers from the identified segments. Maybe the enthusiasts will appreciate these large skiing areas with slopes of a total length above 200 km, and very long valley runs. But for the other five segments, the different types of additional activities and specific services seem to be important during the destination choice process. Even more, to the groups of relaxing or active fair-weather skiers, promotion with extremes might be demotivating (Karl et al., 2015), since they judge their skiing skills as not sufficient for such ambitious resorts.

The segmentation described in this article is supported by other papers analyzing skier segments. A representative survey on destination choice for Tyrolean Ski resorts including German and Austrian guests confirmed the findings of the paper at hand of Pröbstl-Haider and Mostegl (2016).

### 5.2 | Influence of climate change and weather conditions

The literature review revealed that recent research in many cases addressed the impact of climate change and the ski resorts' adaptation to it. Most publications discuss scenarios for frequent and long-lasting snow scarcity by a lack of natural snow from a holistic perspective. In addition, the literature focuses on artificial snowmaking as the main adaptation strategy. These supply-side-oriented studies are complemented by a few studies analyzing the reactions of winter sport guests to snow scarcity (Bausch & Unseld, 2018; Steiger, Knowles, et al., 2022).

However, this discussion overlooks the significant impact by actual weather conditions on the experience. Climate researchers,

**TABLE 8** Description of the six segments found by cluster analysis.

Factors/variables			Segments Share in %	S1 15.3	S2 14.4	S3 15.9	S4 19.5	S5 14.9	S6 20.1
F1 physical activities frequently/daily in %	Activity snowshoeing			11.6	28.9	14.3	3.3	17.1	87.7
	Activity hiking			41.7	53.4	29.9	12.0	47.6	96.1
	Activity cross country			18.5	32.4	21.4	12.7	28.1	88.0
	Activity sledge			22.2	24.0	25.0	6.2	29.1	84.2
	Activity thermal spa			36.1	28.4	19.6	11.6	51.9	88.7
F2 skiing profile	Usually skiing by weather in %	Every day in all weathers		1.9	29.4	44.6	81.5	37.1	49.3
		On days with good weather/good visibility		63.4	54.4	52.2	17.5	53.3	43.7
		On selected days with nice weather, but I sometimes also take a break on such days		34.7	16.2	3.1	1.1	9.5	7.0
	Ski pass preferred in %	Multi-day ski pass (from first to last day of skiing)		19.4	33.8	72.8	89.1	54.3	62.7
		Day tickets		19.4	30.9	15.2	9.8	24.8	20.4
		Depending on the weather, either day or half-day tickets (morning or afternoon)		44.0	29.4	10.7	1.1	19.0	14.8
		Half-day tickets (morning or afternoon)		17.1	5.9	1.3	0.0	1.9	2.1
	Duration of skiing day with good weather in hours			4.1	4.6	5.1	6.5	5.6	5.0
		Skill level skiing/ snowboard-ing in %	Beginner	63.4	32.4	60.7	3.6	7.6	25.7
			Advanced	36.6	59.8	38.8	79.6	83.3	58.5
F3 services frequently/ daily used in %		Excellent		0.0	7.8	0.4	16.7	9.0	15.8
	Service equipment rental			73.2	44.1	94.6	26.2	11.9	97.2
	Service locker rental			29.6	28.9	70.5	14.6	15.2	89.8
F4 social activities frequently/daily in %	Service ski school			25.5	22.6	54.0	5.1	5.7	83.1
	Activity stop in mountain huts			95.4	6.4	93.3	97.1	99.1	97.9
	Activity apres-ski and nightlife			46.8	17.7	19.2	27.6	79.1	81.7
Socio demography descriptive (NOT used for clustering) per variable and segment in %	Activity shopping			68.1	27.0	38.0	17.1	75.2	91.6
	Country	Germany		31.0	51.0	42.9	70.9	61.9	48.2
		Italy		69.0	49.0	57.1	29.1	38.1	51.8
	Gender	Male		49.5	50.0	41.5	54.2	52.4	51.4
		Female		50.5	50.0	58.5	45.8	47.6	48.6
	Age group	18–29		20.4	24.0	25.9	20.7	17.6	27.8
		30–44		23.1	23.5	27.2	22.5	21.9	40.8
		45–59		28.7	20.6	28.1	29.5	28.6	23.6
		60+		27.8	31.9	18.8	27.3	31.9	7.7
	Children in household	No		69.9	63.7	60.7	81.1	72.4	32.4
		Yes		30.1	36.3	39.3	18.9	27.6	67.6
	Monthly net income	Below 2000 Euro		19.0	17.6	21.9	12.4	12.9	14.1
		2001 Euro up to 4000 Euro		58.8	51.5	47.3	38.2	48.1	42.6
		4001 up to 6000 Euro		16.2	23.5	21.9	32.4	28.1	26.4
		6001 Euro or more		6.0	7.4	8.9	17.1	11.0	16.9

such as Olefs et al. (2021) highlight that climate warming is not only characterized by snow scarcity but also an increasing likelihood of rainfall in winter. While rainfall does not necessarily have an influence on the local snow cover it leads to unacceptable conditions for many ski tourists.

Thus, the scientific debate about climate change and skiing is mainly unilateral: it frequently discusses just two opposite situations in a binary manner, namely “snow” or “lack of snow” or introduces

the number of days of a winter season with sufficient snow coverage into agent-based adaptation or simulation models (Balbi et al., 2013; Pons et al., 2014; Soboll & Schmude, 2011). A binary way of thinking can also be found in the public debate about skiing, which is developed into an annually repeating ritual in early winter. Especially winters with little snow in December and early January. The media reports extensively on the associated problems of winter sports resorts. The reaction of ski resorts to this media-driven discussion

intensifies their promise of a snow guarantee. But this assumes that this promise per se is enough to attract visitors. Travelers' destination choice starts with a set of available or considered destinations. The majority of winter guests expect snow (Bausch & Unseld, 2018). Therefore, a snow guarantee is very likely to trigger the consideration of a destination by skiers. It is clear as well that there is not only one option for travelers to be considered as most Alpine destinations promise snow under all weather conditions. Therefore, the fulfillment of specific further expectations each traveler links to a winter vacation trip plays a central role in the competition for guests. Steiger, Posch, et al. (2022) introduced into a choice experiment for Austria besides snow availability for skiing a second parameter, the winter atmosphere by snow-covered mountains and showed a significant influence of this parameter on demand. Therefore, future success in the market needs more than snow-covered slopes.

Supposing that in future, many ski resorts can produce sufficient volumes of artificial snow for their peak season (Steiger, Knowles, et al., 2022), the question of potential further impacts of climate change needs to be discussed. One aspect already discussed had been the potentially later start of the season and the subsequent reactions of skiers as well as the ski resort management (Dawson et al., 2013; Scott et al., 2022; Steiger, Knowles, et al., 2022). This study first looks at daily profiles of skiers' activities and used services as a basis for climate change-related consideration. We observed a strong influence of the weather on the skiers' activities, especially for beginners and advanced skiers. One effect which already occurs frequently today is the variability of snow quality. Even in deep winter, we find alternating cold and warm periods. During very warm periods the snow consistency changes to muddy and heavy slush already at noon. On the slopes, snow mounds require a higher level of physical effort and skiing capacities. This effect can be observed even stronger on sun-exposed valley runs. Moreover, if the temperature falls below zero degrees Celsius at night, the freshly groomed slopes turn icy and hard for the first hours of the next morning. These conditions are not suitable, or at least not enjoyable for most beginners and even advanced skiers with limited physical fitness. Not only snow reliability but even more the quality of snow, therefore, becomes a crucial criterion for destination choice (Sun et al., 2022). Snow quality as an important factor was also discussed in the recent publications of Steiger et al. (2020) and Steiger, Posch, et al. (2022). However, these publications have their focus on seasonal differences or use fixed states of snow quality in a choice model. The aspect of intra-day variability of snow quality is neglected up to now.

The changing or scarce snow conditions may lead to additional problems. A lack of snow quality may lead to crowding experiences since the most suitable areas are highly visited, for example, in higher altitudes or on better-groomed slopes. Perceived crowding is especially relevant for elderly skiers, first-time skiers, beginners and women (Zehrer & Raich, 2016). Crowding influences their sense of well-being negatively (Mirehie & Gibson, 2020) and hinders participation in ski sports. Perception of crowding is significantly influenced by the respective skill level and the behavior of other skiers

(Pikkemaat et al., 2020). Demographic change with an increase in elderly skiers will escalate this problem. Crowding experiences lead to coping behavior which in turn is likely to affect the overall satisfaction with the holiday (Zehrer & Raich, 2016). As Dawson et al. (2013) showed, less engaged skiers are highly sensitive to the need to travel longer distances for skiing. This allows the hypothesis that they are more sensitive in general, concerning ideal respectively uncomfortable skiing conditions. Several ski resorts try to address this problem and are already providing special tickets for ski enthusiasts. They open the slopes in the early morning hours, to reduce possible crowding experiences and enhance the fun for this specific target group.

### 5.3 | Pricing strategies

In the literature review, we found some publications discussing pricing strategies for ski passes, for example, discussing the aspect of discounting in case of bad weather. New proposals based on hedonic pricing (Malasevska, 2018) or for dynamic pricing, revenue optimal pricing, or weather dependent pricing (Holmgren & McCracken, 2014; Malasevska et al., 2017) were made. These publications suppose that lower prices for days with unpleasant weather could be a differentiation approach to stimulate demand. According to our findings, it must be considered highly doubtful, that weather-dependent pricing strategies will influence the number of sold day or half-day tickets. These outcomes are confirmed by Pröbstl-Haider and Flaig (2019). The suggestions in favor of weather dependent pricing treat the skiers as a homogeneous segment in tourism and in most cases, do not consider the important aspect of "Value for Money" as discussed by Matzler et al. (2021). In this context the dynamization of providing digital solutions was observable after the COVID-19 pandemic and might be a first step to resolve digital skill constraints at supply side (Parsons et al., 2023).

### 5.4 | The relevance of additional activities besides skiing

A more general result of this study is linked to the strategic product development of winter vacation destinations. The results reveal that besides skiing other activities are of increasing importance. Hiking is frequently practiced by four of the six segments. Other activities such as using the spa facilities or tours with horse sledges are an essential part of the stay for many guests. Therefore, the marketing and description of winter ski destinations should include nonskiing-related destination attributes (Ferrand & Vecchiattini, 2002). According to our results, it is more important to improve the infrastructure and services for other activities than to enlarge the ski resort. This requires an integrated holistic approach by destination management for skiing areas (Nordin et al., 2019), which should be developed in cooperation with the respective cable car industry (Bramwell, 2011).

## 6 | CONCLUSIONS

### 6.1 | Theoretical contributions

This research takes a holistic perspective on winter ski vacationists. While former research was focused primarily on the ski resorts and the skiers' satisfaction, we argue that the activities and related experiences besides skiing play a key role in remaining competitive in a market with many competitors offering closely comparable services in combination with snow guarantee. We show that the demand side market of skiers consists of a variety of segments, of which the segment of enthusiastic winter ski vacationists who are focused mainly on skiing covers less than 20%.

Leading Alpine ski destinations mostly present themselves with a strong focus on the quality of the core product: the skiing facilities. The landing pages of the websites show pictures of perfectly groomed slopes in a deep snowy winter landscape. The recent scientific debate partially followed this approach by analyzing the positive effect of ski resort size on profitability and especially discussing the aspect of snow reliability. Many scholars have contributed to this discussion with studies on climate change impact and adaptation strategies. The article at hand contributes to understanding the demand side. Our literature review revealed that only a few studies have analyzed the demand side of the skier market going beyond the skiers' activities besides skiing and snowboarding. In their simulation of future winter tourist arrivals, Balbi et al. (2013) proposed a more differentiated demand structure but did not provide an analysis for it. However, in contrast to other publications, this study utilizes day activity and service profiles to reveal in detail that the winter tourists in ski resorts consist of highly diverse target groups.

### 6.2 | Practical implications

Destination management should consider the presented segmentation of guests and the related development of multioptional winter vacation products. In this context, the marketing and pricing concept could be adapted accordingly. Furthermore, the size of the ski resort is—according to this publication—only one factor among several others.

The presented results show, that in general the product “ski vacation” must be understood as a package of activities individually and situationally combined by the guests. Depending on the personal skiing profile as well as the weather conditions, visiting a thermal spa, socializing activities or additional activities such as hiking, become part of the stay in a ski resort. Managers should be aware that offering additional activities and related services is crucial, especially for groups of guests with limited technical skills, lower physical abilities, or a higher subjective need for safety. In this context, the role of snow quality and crowding will play an important role in the future because of two long-term drivers: demographic change will increase the share of elder skiers being more sensitive to crowding, while climate change

will decrease snow quality in lower areas and increase the pressure to move up to higher regions causing even more crowded situations.

The results show that the observed differences in the behavior of each segment over the course of a ski day should be applied to develop innovative and new pricing systems. Product development should consider that beginners ski fewer hours per day and make fewer runs within this period, excellent skiers tend to take advantage of the whole day and the whole ski resort. Managers working on new offers, marketing and pricing concepts should factor in these differences. Therefore, we suggest an alternative, tailored pricing systems reflecting the daily kilometers based on the individual profile of the skiers and app-based e-commerce platforms.

In the long run, Alpine winter holiday destination managers will have to broaden the product diversity, as the market potential for multioptional guests is high but needs segment-specific strategies and marketing. Therefore, ski resort managers need to widen their current focus on the ski business to a destination experience perspective and take responsibility across the system boundaries of their resorts.

## 7 | LIMITATIONS OF RESULTS AND NEED FOR FURTHER RESEARCH

The analysis is based on data collected in two main skier source markets: Germany and Italy. We saw skier profile differences between these two countries and therefore other significant differences might be found when adding further important source market countries. To show the heterogeneity of the skier market, we used factor and cluster analysis for segmentation where we excluded the children-related services, such as ski school and ski kindergarten, as they were not relevant for many study participants without children. Therefore, the segmentation shows an overall picture that would need further specification for the family target group. Moreover, we cannot ignore the possible impact of the COVID-19 pandemic on activities and services in the year of the last ski vacation, as not only ski holidays in 2022 were covered in the survey.

The present research is a starting point to understand winter vacation in skiing destinations as a product going far beyond the services offered by the ski resort itself. As this is, to our knowledge, the first study to look at winter ski tourism from a holistic demand side perspective, there are open research questions concerning the interaction between ski resort and destination and related governance processes. Frequently the ski resort companies have a very powerful position in the local governance system and tend to focus on their own business. Therefore, governance approaches are needed to balance the role of the stakeholders more along the winter vacation guests' interests. A further field of research are the major drivers demographic change and climate change and their impact on the change of the winter vacation guests' activity profiles and related need for services. Especially in the field of climate change, we currently see a lack of research taking a closer look at the demand side consequences.

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## CONFLICT OF INTEREST STATEMENT

The authors declare no conflict of interest.

## DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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