

This file has been downloaded from Inland Norway University of Applied Sciences' Open Research Archive, <http://brage.bibsys.no/inn/>

The article has been peer-reviewed, but does not include the publisher's layout, page numbers and proof-corrections

Citation for the published paper:

**[Malasevksa, I., Haugom, E., Lien, G., Hinterhuber, A. & Alnes, P. K. (2022) Managing structural constraints in recreational alpine skiing: a choice modelling approach. *Managing Sport and Leisure.*]**

**[DOI:**

**<https://doi.org/10.1080/23750472.2021.2020679>]**

Research note

**Managing structural constraints in recreational alpine skiing: a choice modelling approach** (accepted for publishing)

Iveta Malasevska

Inland Norway University of Applied Science, Postboks 952, 2604 Lillehammer, Norway, tel.: +47 61 28 84 37, e-mail: [iveta.malasevska@inn.no](mailto:iveta.malasevska@inn.no) (Corresponding author)

Erik Haugom

Inland Norway University of Applied Sciences, Postboks 952, 2604 Lillehammer, Norway, tel.: +47 61 28 83 77, e-mail: [erik.haugom@inn.no](mailto:erik.haugom@inn.no)

Gudbrand Lien

Inland Norway University of Applied Sciences, Postboks 952, 2604 Lillehammer, Norway, tel.: +47 92 48 83 35, e-mail: [gudbrand.lien@inn.no](mailto:gudbrand.lien@inn.no)

Andreas Hinterhuber

Ca' Foscari University of Venice, Dorsoduro 3246, 30123 Venice, Italy, tel.: +41 23 46 975, e-mail: [andreas.hinterhuber@unive.it](mailto:andreas.hinterhuber@unive.it)

Per Kristian Alnes

Inland Norway University of Applied Sciences, Postboks 952, 2604 Lillehammer, Norway,  
e-mail: [per.ernes@inn.no](mailto:per.ernes@inn.no)

**Aknowledgement**

This work was supported by the Regional Research Funds in Norway under grant number 285141.

**Declarations of interest** None

## **Abstract**

The alpine skiing industry faces a decline in the number of new active skiers, dropouts of existing active skiers, as well as a decline in overall participation frequency. Structural leisure constraints can be considered as a form of managerial failure preventing customers to participate in leisure activities. The purpose of this study is to use choice modelling to examine how the marginal willingness-to-pay for various leisure constraining factors differ among skiers and to provide empirical evidence of how pricing could be used as a negotiation instrument to overcome structural leisure constraints. The rationale behind the choice modelling approach is that a respondent makes a choice from a set of hypothetical scenarios of a product or service that includes various combinations of attribute levels. The findings emphasize the skiing preferences and marginal willingness-to-pay vary among less frequent, frequent, and very frequent skiers. Price differentiation can be used as an instrument to limit the influence of constraints and to help individuals to overcome the structural leisure constraints. The study provides valuable implications for practitioners based on an understanding of the impact the price has on individuals' choices.

*Keywords:* leisure constraints, negotiation strategies, willingness-to-pay, pricing, alpine skiing

## **Introduction**

Even though the global visitation figures point out growth in the alpine skiing industry it still faces challenges related to a decline in the number of new skiers from the youth segments, dropouts of existing skiers, as well as decline in overall participation frequency (Hudson & Hudson, 2015; Vanat, 2020). Climate change is seen as a threat to the alpine industry and a cause of declining ski visits (Damm, Greuell, Landgren, &

Prettenthaler, 2017; Duvillard, Ravanel, & Deline, 2015; Spandre et al., 2019). But it is important to note that not necessarily the entire industry is at risk to climate change, but rather just individual ski areas at geographically disadvantaged regions. A part of the ski areas could even benefit of changed business environment and gain market share due to lost competition (Dawson & Scott, 2013). Studying leisure constraints is timely and important as the status symbols for the current and future generations have completely changed. Naish (2008) points out that autonomy, space, balance, time, and leisure are the new status symbols. However, the status symbol can be culturally dependent. While business, overwork and lack of leisure time driven by perception that a busy person possesses desired human capital qualities and is scarce and in demand in the job market is valued as a high status symbol among Americans, the effect is reversed for Europeans (Bellezza, Paharia, & Keinan, 2017). Additionally, Smeets, Whillans, Bekkers, and Norton (2020) emphasize that the affluent and the general population spend the same amount of time on overall leisure, but wealthy engage in more active leisure and have greater job autonomy than the general population. According to Jackson (1991) leisure constraints are “factors that are assumed by researchers and perceived or experienced by individuals to limit the formation of leisure preferences and to inhibit or prohibit participation in leisure activities”. The leisure constraint studies in recreational alpine skiing are mostly based on the three-dimensional classification of leisure constraints (intrapersonal, interpersonal, and structural) (see e.g., Alexandris et al., 2017; Alexandris et al., 2008; Gilbert & Hudson, 2000). Although neither type of constraint is experienced with equal intensity by everyone, structural constraints such as weather, time- and cost-related constraints are ranked among the most widely and intensely experienced obstacles of the achievement of leisure goals (Hinch et al., 2005; Huber et al., 2018; Yamashita & Hallmann, 2020). Lately, structural constraints have been considered as a form of managerial failure preventing customers to participate in leisure activities (Rocha &

Fleury, 2017). In this regard, an improvement in pricing policy (i.e. price differentiation, discounts, refunds) could be used as an instrument to help participants overcome the important constraints especially those related to financial limitations (Yamashita & Hallmann, 2020). Yet, there has not been done empirical verification concerning whether the willingness-to-pay for leisure activities varies among less frequent and very frequent participants.

The purpose of this study is twofold: firstly, to examine how the marginal willingness-to-pay for various structural leisure constraining factors differ among skiers; secondly, to provide empirical evidence of how pricing could be used as negotiation instrument to overcome structural constraints.

### **Data, Variables and Descriptive Statistics**

The data stem from choice-based conjoint (CBC) questionnaire conducted online among skiers in Norway in the time period from February 4 to March 17, 2019. The rationale behind the CBC is that a respondent makes a choice from a set of hypothetical scenarios of a product that includes various combinations of attribute levels. The attributes and attribute levels (table 1) were based on findings from 44 face-to-face semi-structured interviews with existing skiers and review of previous studies (see e.g. Haugom & Malasevska, 2019).

*Table 1. Conjoint attributes and levels.*

<b>Attributes</b>	<b>Levels</b>	<b>Attributes</b>	<b>Levels</b>
<b>Weather conditions</b>	Sunny	<b>Wind</b>	Calm 0–0.3 m/s
	Cloudy		Light air/ breeze 0.4–3.3 m/s
	Bad visibility		Gentle/ moderate breeze 3.4–7.9 m/s
	Precipitations (rain/snow)		Fresh breeze >8 m/s
<b>Temperature</b>	+5°C	<b>Crowdedness (on slopes)</b>	A little crowded

	-2°C		Somewhat crowded
	-9°C		Crowded
	-16°C		Very crowded
<b>Weekday</b>	Monday–Wednesday	<b>Price</b>	NOK 250 <sup>1</sup>
	Thursday–Friday		NOK 350
	Saturday		NOK 450
	Sunday		NOK 550
<b>Size of the ski resort (total length of slopes)</b>	50km		
	21 km		
	7 km		

We use orthogonal main effect plan to generate hypothetical skiing day alternatives. This plan controls that each level of one attribute occurs with each level of another attribute with proportional frequencies. A total of 48 choice sets were designed using the shifting method that ensures statistical efficiency (Rao, 2014). We used six questionnaires consisting of eight different choice sets each (see Appendix A). Each choice set contained three different scenarios in addition to the no-purchase option. In the questionnaire, respondents were asked to assume that they were deciding to visit a ski resort and choose between different hypothetical skiing day scenarios (see Appendix B).

The target population for this study are people of 18 years or older, who are interested in alpine skiing, and who do not possess a seasonal ski pass. A total of 415 completed survey forms met our sample criteria. The number of evaluated choice sets of this study is 3,320 ( $415 \times 8 = 3,320$ ) that fulfils the minimum requirements to ensure reliable results of the CBC analysis (Orme, 2010). The sample's descriptive statistics are presented in Table 2.

---

<sup>1</sup> NOK 100 ≈ EUR 10.

Table 2. Sample characteristics (n=415).

Variable		Percentage
Gender	Male	45.5
	Female	54.5
Average age (years)	36.0 (median = 34.0, SD =12.3)	
Family status	Single	26.0
	Single with children	5.1
	Couple	26.8
	Couple with children	41.7
	Other	0.4
Net income	Below NOK 100 000	9.9
	NOK 100 000–NOK 300 000	9.2
	NOK 300 000–NOK 600 000	19.8
	NOK 600 001–NOK 900 000	21.0
	NOK 900 001–NOK 1 200 000	18.3
	More than NOK 1 200 000	14.2
	Prefer not to answer	7.6
Current occupation	Working full time	68.2
	Working part time	6.0
	Student	10.1
	Student working part time	9.9
	Unemployed	0.5
	Prefer not to answer	5.3
Nationality	Norwegian	95.7
	Other	4.3
Average number of skiing days in a typical winter season	5.9 (median = 5.0, SD =10.3)	

Note: NOK 100 ≈ EUR 10.

We estimate part-worth utilities for a skiing day's attribute levels using conditional logit model that assumes that individual choices between skiing day alternatives are utilities of the relevant features of skiing day alternatives (McFadden, 1973). The respondent's utility is divided into a representative component and a random component. The representative component of utility for the no-purchase option is normalized to 0. The representative component for the various skiing days is assumed to be as follows:

$$\begin{aligned}
V_j = & ASC + \beta_{Cloudy}Cloudy_j + \beta_{Badvisibility}Badvisibility_j + \\
& \beta_{Precipitation}Precipitation_j + \\
& \beta_{Lightmoderatebreeze}Lightmoderatebreeze_j + \\
& \beta_{Freshbreeze}Freshbreeze_j + \beta_{Temperature-2}Temperature - 2_j + \quad (1) \\
& \beta_{Temperature-9}Temperature - 9_j + \beta_{Temperature-16}Temperature - \\
& 16_j + \beta_{Crowded}Crowded_j + \beta_{Weekend}Weekend_j + \beta_{KM}KM_j + \\
& \beta_{Price}Price_j
\end{aligned}$$

where  $V_j$  denotes the representative component of utility for skiing day  $j$ .  $ASC$  is the alternative specific constant. We nested the attribute levels of individual days in two groups: (1) midweek days (Monday–Friday) and (2) weekend days (Saturday–Sunday), because the alternative levels “Monday–Wednesday” and “Thursday–Friday” as well as “Saturday” and “Sunday” were in close proximity on a preference scale and could cause overestimation of these attribute levels (Paczkowski, 2018). The same has been done with the alternative levels related to crowdedness and wind. The attribute levels “a little crowded” and “somewhat crowded” have been nested in a group “uncrowded” and the attribute levels “crowded” and “very crowded” have been nested in a group “crowded”. The attribute levels “light air/ breeze” and “gentle/ moderate breeze” have been nested in a group “light/ moderate breeze”.



The price and km of the ski slopes attributes were included in the model as continuous variables.

Finally, the marginal willingness-to-pay for each non-monetary variable is estimated by the function  $\beta_{nm}/\beta_m$ ; where  $\beta_{nm}$  is the estimated coefficient of the non-monetary variable, and  $\beta_m$  is the estimated coefficient of a monetary variable.

## Results

We have divided respondents into three groups according to their skiing frequency: (1) respondents who visit a ski resort 0–2 days, (2) 3–5 days, and (3) more than 5 times in a typical winter season. In all three groups, the coefficient of the variable *Price* is significantly negative, indicating the respondents' preference for a cheaper ski passes (see table 3).

Table 3. Estimation results using a conditional logit model.

Skiing day attributes	Less frequent skiers (0–2 skiing days)	Frequent skiers (3–5 skiing days)	Very frequent skiers (more than 5 skiing days)
ASC	2.480***	2.299***	1.793***
<i>Weather conditions (reference level—sunny)</i>			
Cloudy	–0.446***	–0.300**	–0.135
Bad visibility	–0.735***	–0.546***	–0.419***
Precipitations (rain/snow)	–0.945***	–0.512***	–0.413***
<i>Wind (reference level—windless)</i>			
Light/ moderate breeze 0.4–7.9 m/s	–0.312***	–0.396***	–0.173**
Fresh breeze > 8 m/s	–0.357***	–0.450***	–0.323***
<i>Temperature (reference level +5°C)</i>			
–2°C	0.190	0.276**	0.566***
–9°C	–0.103	–0.048	0.323***
–16°C	–0.191	–0.351***	0.009

<b>Skiing day attributes</b>	<b>Less frequent skiers (0–2 skiing days)</b>	<b>Frequent skiers (3–5 skiing days)</b>	<b>Very frequent skiers (more than 5 skiing days)</b>
<i>Crowdedness on ski slopes (reference level—uncrowded)</i>			
Crowded	–0.888***	–0.666***	–0.996***
<i>Weekday (reference level— midweek)</i>			
Weekend	0.235***	0.306***	0.228***
KM of ski slopes	0.011***	0.012***	0.025***
Price for a one-day ski pass	–0.005***	–0.004***	–0.005***
N	3840 (number of events 960)	3968 (number of events 992)	5472 (number of events 1368)
R <sup>2</sup>	.124	.115	.149
Adjusted R <sup>2</sup>	.115	.106	.142
Log likelihood at start	–1331	–1375	–1896
Log likelihood at convergence	–1165	–1217	–1615

Notes: \*\*\* Significant at the 1% level. \*\* Significant at the 5% level. \* Significant at the 10% level.

The results in table 4 show that all skiers prefer sunny weather on a skiing day compared with cloudy, foggy weather or day with precipitations. However, the less frequent and frequent skiers are more sensitive to so-called bad weather conditions than very frequent skiers. All skiers prefer windless skiing days. The most desirable temperature for alpine skiing seems to be an air temperature of around  $-2^{\circ}\text{C}$  for all skiers. However, the marginal willingness-to-pay for skiing under various air temperatures varies among skiers. An average very frequent skier would be willing to pay up to approximately NOK 116 extra to ski on a day with an air temperature of  $-2^{\circ}\text{C}$  compared with skiing on a day with an air temperature of  $+5^{\circ}\text{C}$ , holding all other characteristics fixed. In turn, an average less frequent and frequent skier would be willing to pay, on average, only NOK 42 and NOK 64 extra, respectively, for skiing on a day with an air temperature of  $-2^{\circ}\text{C}$ , compared with skiing on day with an air temperature of  $+5^{\circ}\text{C}$ . None of the skiers prefer crowded ski slopes. All skiers prefer skiing during the weekend. However, the highest marginal willingness-to-pay for skiing in the

weekend is found for the frequent skiers. The results also show that very frequent skiers are willing to pay approximately NOK 5 for each additional km of ski slopes, while less frequent and frequent skiers are willing to pay only approximately NOK 2 and NOK 3, respectively. These results indicate that the very frequent skiers prefer larger ski areas while the size of a ski area is less important for frequent or less frequent skiers.

Table 4. Marginal willingness-to-pay for skiing day's attributes.

<b>Skiing day attributes</b>	<b>Less frequent skiers (0–2 skiing days)</b>	<b>Frequent skiers (3–5 skiing days)</b>	<b>Very frequent skiers (more than 5 skiing days)</b>
<i>Weather conditions (reference level—sunny)</i>			
Cloudy	NOK –97.77 [–151.51; –49.27]	NOK –68.94 [–121.90; –19.02]	NOK –27.71 [–69.38; 12.16]
Bad visibility	NOK –161.20 [–221.69; –108.05]	NOK –125.61 [–189.06; –71.92]	NOK –85.93 [–131.06; –44.93]
Precipitations (rain/snow)	NOK –207.24 [–272.99; –150.21]	NOK –117.74 [–178.38; –63.67]	NOK –84.72 [–128.51; –43.24]
<i>Wind (reference level—windless)</i>			
Light/ moderate breeze 0.4– 7.9m/s	NOK –68.35 [–116.37; –22.64]	NOK –91.14 [–139.92; –47.13]	NOK –35.42 [–71.29; 0.32]
Fresh breeze > 8 m/s	NOK –77.21 [–133.68; –27.97]	NOK –103.60 [–161.76; –50.60]	NOK –66.14 [–110.27; –24.11]
<i>Temperature (reference level +5°C)</i>			
–2°C	NOK 41.61 [–12.17; 96.82]	NOK 63.58 [13.45; 116.75]	NOK 115.97 [73.55; 160.16]
–9°C	NOK –22.55 [–76.94; 30.29]	NOK –11.12 [–66.95; 43.01]	NOK 66.30 [21.62; 111.05]
–16°C	NOK –42.00 [–98.15; 12.97]	NOK –80.77 [–141.48; –26.01]	NOK 1.80 [–42.71; 46.63]
<i>Crowdedness on ski slopes (reference level—uncrowded)</i>			
Crowded	NOK –194.87 [–247.09; –151.52]	NOK –153.30 [–198.91; –113.10]	NOK –204.28 [–245.80; –168.82]
<i>Weekday (reference level— midweek)</i>			

<b>Skiing day attributes</b>	<b>Less frequent skiers (0–2 skiing days)</b>	<b>Frequent skiers (3–5 skiing days)</b>	<b>Very frequent skiers (more than 5 skiing days)</b>
Weekend	NOK 51.52 [13.35; 92.03]	NOK 70.39 [30.49; 114.34]	NOK 46.67 [16.27; 77.12]
KM of ski slopes	NOK 2.35 [1.37; 3.48]	NOK 2.76 [1.75; 3.89]	NOK 5.04 [4.16; 6.08]

Note: 95% confidence interval in square brackets.

## **Conclusion and Implications**

An important conclusion of this study is that skiing preferences and marginal willingness-to-pay for structural leisure constraining factors vary among less frequent, frequent, and very frequent skiers. The less frequent skiers are most sensitive to weather conditions and less willing to pay for undesirable weather conditions while the very frequent skiers have the highest willingness to pay for the additional length of the ski slopes.

Structural leisure constraints tend to be external to the leisure participant and are more likely to be in the control of the leisure and recreation managers. One way to help individuals to overcome the leisure constraints is to limit the influence of constraints by providing a ski pass at different prices. For less frequent and frequent skiers, the ski pass price could seem too high, but at the same time they are less willing to pay for additional length of ski slopes. Therefore the ski resort could provide limited ski pass at a reduced price for this group of skiers. The ski pass would then be cheaper, but valid only on a limited amount of ski lifts or only on particular days of the week, while a regular ski pass would allow for full access to ski lifts on all weekdays. Future research should investigate further the role of price differentiation for a consumer's self-segmentation and as a motivation criterion for participation in leisure activities.

Although this study is set in the context of the alpine skiing industry, we believe that the research results may be applicable also to other service industries.

Our data were collected before Covid-19 pandemic. The pandemic has likely changed individuals' preferences with increased regard to health threats as a travel constraint and especially avoiding crowded mass tourism destinations (Kock et al., 2020; Zenker & Kock, 2020). Further studies are needed to estimate how the marginal willingness-to-pay for structural leisure constraining factors has changed during and after pandemic.

Additionally, the current study has only examined the skiers in Norway. Future research could examine other recreational and leisure activities.

## References

- Alexandris, K., Du, J., Funk, D., & Theodorakis, N. D. (2017). Leisure constraints and the psychological continuum model: A study among recreational mountain skiers. *Leisure studies*, 36(5), 670–683. doi:<https://doi.org/10.1080/02614367.2016.1263871>
- Alexandris, K., Kouthouris, C., Funk, D., & Chatzianni, E. (2008). Examining the relationships between leisure constraints, involvement and attitudinal loyalty among Greek recreational skiers. *European Sport Management Quarterly*, 8(3), 247–264. doi:<https://doi.org/10.1080/16184740802224175>
- Bellezza, S., Paharia, N., & Keinan, A. (2017). Conspicuous consumption of time: When busyness and lack of leisure time become a status symbol. *Journal of Consumer Research*, 44(1), 118-138.
- Damm, A., Greuell, W., Landgren, O., & Prettenthaler, F. (2017). Impacts of + 2 C global warming on winter tourism demand in Europe. *Climate Services*, 7, 31-46.
- Dawson, J., & Scott, D. (2013). Managing for climate change in the alpine ski sector. *Tourism management*, 35, 244-254.
- Duvillard, P.-A., Ravanel, L., & Deline, P. (2015). Risk assessment of infrastructure destabilisation due to global warming in the high French Alps. *Journal of Alpine Research/ Revue de géographie alpine*(103-2).
- Gilbert, D., & Hudson, S. (2000). Tourism demand constraints: A skiing participation. *Annals of Tourism research*, 27(4), 906–925. doi:[https://doi.org/10.1016/S0160-7383\(99\)00110-3](https://doi.org/10.1016/S0160-7383(99)00110-3)
- Haugom, E., & Malasevska, I. (2019). The relative importance of ski resort- and weather-related characteristics when going alpine skiing. *Cogent Social Sciences*, 5(1), 1681246. doi:<https://doi.org/10.1080/23311886.2019.1681246>

- Hinch, T., Jackson, E. L., Hudson, S., & Walker, G. (2005). Leisure constraint theory and sport tourism. *Sport in Society*, 8(2), 142–163.  
doi:<https://doi.org/10.1080/17430430500087435>
- Huber, D., Milne, S., & Hyde, K. F. (2018). Constraints and facilitators for senior tourism. *Tourism Management Perspectives*, 27, 55–67.  
doi:<https://doi.org/10.1016/j.tmp.2018.04.003>
- Hudson, L., & Hudson, S. (2015). Global ski industry trends. Retrieved from <http://blog.anderstatt-swissalps.ch/en/2015/10/01/global-ski-industry-trends-by-louise-and-simon-hudson/>
- Jackson, E. L. (1991). Leisure constraints/constrained leisure: Special issue introduction. *Journal of Leisure Research*, 23(4), 279–285.  
doi:<https://doi.org/10.1080/00222216.1991.11969860>
- Kock, F., Nørfelt, A., Josiassen, A., Assaf, A. G., & Tsionas, M. G. (2020). Understanding the COVID-19 tourist psyche: The evolutionary tourism paradigm. *Annals of Tourism research*, 85, 103053. doi:<https://doi.org/10.1016/j.annals.2020.103053>
- McFadden, D. (1973). Conditional logit analysis of qualitative choice behavior. In P. Zarembka (Ed.), *Frontiers of Econometrics* (pp. 105-142). New York, NY: Academic Press.
- Naish, J. (2008). *Enough: Breaking free from the world of more*. London, UK: Hodder & Stoughton.
- Orme, B. K. (2010). *Getting Started with Conjoint Analysis: Strategies for Product Design and Pricing Research* (2nd ed.). Madison, Wis: Research Publishers, LLC.
- Paczkowski, W. R. (2018). *Pricing Analytics: Models and Advanced Quantitative Techniques for Product Pricing*. London: Routledge.
- Rao, V. R. (2014). *Applied Conjoint Analysis*. New York: Springer.

- Rocha, C. M., & Fleury, F. A. (2017). Attendance of Brazilian soccer games: The role of constraints and team identification. *European Sport Management Quarterly*, 17(4), 485–505. doi:<https://doi.org/10.1080/16184742.2017.1306871>
- Smeets, P., Whillans, A., Bekkers, R., & Norton, M. I. (2020). Time use and happiness of millionaires: Evidence from The Netherlands. *Social Psychological and Personality Science*, 11(3), 295-307.
- Spandre, P., François, H., Verfaillie, D., Lafaysse, M., Déqué, M., Eckert, N., . . . Morin, S. (2019). Climate controls on snow reliability in French Alps ski resorts. *Scientific reports*, 9(1), 1-9.
- Vanat, L. (2020). *International Report on Snow & Mountain Tourism. Overview of the key industry figures for ski resorts (Report No. 12)*. Retrieved from <https://www.vanat.ch/RM-world-report-2020.pdf>
- Yamashita, R., & Hallmann, K. (2020). Interdependencies of structural constraints, attachment and behavioural intentions of sport spectators. *Managing Sport and Leisure*, 1–14. doi:<https://doi.org/10.1080/23750472.2020.1765845>
- Zenker, S., & Kock, F. (2020). The coronavirus pandemic—A critical discussion of a tourism research agenda. *Tourism Management*, 81, 104164. doi:<https://doi.org/10.1016/j.tourman.2020.104164>



## Appendix A

### *Choice Sets Included in Each Questionnaire*

Choice set	Weather conditions	Wind	Temperature	Crowdedness (on slopes)	Weekday	Size of the ski resort	Price (NOK)
<b>QUESTIONNAIRE 1</b>							
1	Cloudy	Gentle/moderate breeze 3.4 - 7.9 m/s	-16°C	Very crowded	Saturday	21 km (Skeikampen)	250
	Bad visibility	Fresh breeze > 8 m/s	+5°C	A little crowded	Sunday	7 km (Sjusjøen)	350
	Precipitation (rain/snow)	Calm 0 - 0.3 m/s	-2°C	Somewhat crowded	Monday - Wednesday	50 km (Hafjell)	450
2	Sunny	Light air/light breeze 0.4 - 3.3 m/s	-16°C	Somewhat crowded	Monday - Wednesday	50 km (Hafjell)	450
	Cloudy	Gentle/moderate breeze 3.4 - 7.9 m/s	+5°C	Crowded	Thursday - Friday	21 km (Skeikampen)	550
	Bad visibility	Fresh breeze > 8 m/s	-2°C	Very crowded	Saturday	7 km (Sjusjøen)	250
3	Precipitation (rain/snow)	Light air/light breeze 0.4 - 3.3 m/s	-9°C	Crowded	Monday - Wednesday	7 km (Sjusjøen)	550
	Sunny	Gentle/moderate breeze 3.4 - 7.9 m/s	-16°C	Very crowded	Thursday - Friday	50 km (Hafjell)	250
	Cloudy	Fresh breeze > 8 m/s	+5°C	A little crowded	Saturday	21 km (Skeikampen)	350
4	Cloudy	Calm 0 - 0.3 m/s	-9°C	Somewhat crowded	Sunday	50 km (Hafjell)	250
	Bad visibility	Light air/light breeze 0.4 - 3.3 m/s	-16°C	Crowded	Monday - Wednesday	21 km (Skeikampen)	350
	Precipitation (rain/snow)	Gentle/moderate breeze 3.4 - 7.9 m/s	+5°C	Very crowded	Thursday - Friday	7 km (Sjusjøen)	450
5	Sunny	Gentle/moderate breeze 3.4 - 7.9 m/s	-2°C	A little crowded	Thursday - Friday	7 km (Sjusjøen)	550
	Cloudy	Fresh breeze > 8 m/s	-9°C	Somewhat crowded	Saturday	50 km (Hafjell)	250
	Bad visibility	Calm 0 - 0.3 m/s	-16°C	Crowded	Sunday	21 km (Skeikampen)	350
6	Cloudy	Light air/light breeze 0.4 - 3.3 m/s	-2°C	Crowded	Saturday	7 km (Sjusjøen)	450

Choice set	Weather conditions	Wind	Temperature	Crowdedness (on slopes)	Weekday	Size of the ski resort	Price (NOK)
	Bad visibility	Gentle/moderate breeze 3.4 - 7.9 m/s	-9°C	Very crowded	Sunday	50 km (Hafjell)	550
	Precipitation (rain/snow)	Fresh breeze > 8 m/s	-16°C	A little crowded	Monday - Wednesday	21 km (Skeikampen)	250
7	Precipitation (rain/snow)	Calm 0 - 0.3 m/s	-2°C	Somewhat crowded	Monday - Wednesday	21 km (Skeikampen)	450
	Sunny	Light air/light breeze 0.4 - 3.3 m/s	-9°C	Crowded	Thursday - Friday	7 km (Sjusjøen)	550
	Cloudy	Gentle/moderate breeze 3.4 - 7.9 m/s	-16°C	Very crowded	Saturday	50 km (Hafjell)	250
8	Bad visibility	Light air/light breeze 0.4 - 3.3 m/s	+5°C	A little crowded	Thursday - Friday	21 km (Skeikampen)	550
	Precipitation (rain/snow)	Gentle/moderate breeze 3.4 - 7.9 m/s	-2°C	Somewhat crowded	Saturday	7 km (Sjusjøen)	250
	Sunny	Fresh breeze > 8 m/s	-9°C	Crowded	Sunday	50 km (Hafjell)	350
<b>QUESTIONNAIRE 2</b>							
1	Bad visibility	Gentle/moderate breeze 3.4 - 7.9 m/s	-9°C	A little crowded	Monday - Wednesday	21 km (Skeikampen)	250
	Precipitation (rain/snow)	Fresh breeze > 8 m/s	-16°C	Somewhat crowded	Thursday - Friday	7 km (Sjusjøen)	350
	Sunny	Calm 0 - 0.3 m/s	+5°C	Crowded	Saturday	50 km (Hafjell)	450
2	Sunny	Calm 0 - 0.3 m/s	+5°C	Crowded	Saturday	21 km (Skeikampen)	450
	Cloudy	Light air/light breeze 0.4 - 3.3 m/s	-2°C	Very crowded	Sunday	7 km (Sjusjøen)	550
	Bad visibility	Gentle/moderate breeze 3.4 - 7.9 m/s	-9°C	A little crowded	Monday - Wednesday	50 km (Hafjell)	250
3	Bad visibility	Fresh breeze > 8 m/s	-2°C	Crowded	Monday - Wednesday	50 km (Hafjell)	550
	Precipitation (rain/snow)	Calm 0 - 0.3 m/s	-9°C	Very crowded	Thursday - Friday	21 km (Skeikampen)	250
	Sunny	Light air/light breeze 0.4 - 3.3 m/s	-16°C	A little crowded	Saturday	7 km (Sjusjøen)	350
4	Precipitation (rain/snow)	Light air/light breeze 0.4 - 3.3 m/s	-9°C	Very crowded	Saturday	7 km (Sjusjøen)	250

Choice set	Weather conditions	Wind	Temperature	Crowdedness (on slopes)	Weekday	Size of the ski resort	Price (NOK)
	Sunny	Gentle/moderate breeze 3.4 - 7.9 m/s	-16°C	A little crowded	Sunday	50 km (Hafjell)	350
	Cloudy	Fresh breeze > 8 m/s	+5°C	Somewhat crowded	Monday - Wednesday	21 km (Skeikampen)	450
5	Bad visibility	Light air/light breeze 0.4 - 3.3 m/s	+5°C	Very crowded	Monday - Wednesday	21 km (Skeikampen)	350
	Precipitation (rain/snow)	Gentle/moderate breeze 3.4 - 7.9 m/s	-2°C	A little crowded	Thursday - Friday	7 km (Sjusjøen)	450
	Sunny	Fresh breeze > 8 m/s	-9°C	Somewhat crowded	Saturday	50 km (Hafjell)	550
6	Cloudy	Light air/light breeze 0.4 - 3.3 m/s	-2°C	Very crowded	Sunday	21 km (Skeikampen)	550
	Bad visibility	Gentle/moderate breeze 3.4 - 7.9 m/s	-9°C	A little crowded	Monday - Wednesday	7 km (Sjusjøen)	250
	Precipitation (rain/snow)	Fresh breeze > 8 m/s	-16°C	Somewhat crowded	Thursday - Friday	50 km (Hafjell)	350
7	Precipitation (rain/snow)	Fresh breeze > 8 m/s	-16°C	Somewhat crowded	Thursday - Friday	21 km (Skeikampen)	350
	Sunny	Calm 0 - 0.3 m/s	+5°C	Crowded	Saturday	7 km (Sjusjøen)	450
	Cloudy	Light air/light breeze 0.4 - 3.3 m/s	-2°C	Very crowded	Sunday	50 km (Hafjell)	550
8	Bad visibility	Gentle/moderate breeze 3.4 - 7.9 m/s	-9°C	Somewhat crowded	Thursday - Friday	7 km (Sjusjøen)	350
	Precipitation (rain/snow)	Fresh breeze > 8 m/s	-16°C	Crowded	Saturday	50 km (Hafjell)	450
	Sunny	Calm 0 - 0.3 m/s	+5°C	Very crowded	Sunday	21 km (Skeikampen)	550
<b>QUESTIONNAIRE 3</b>							
1	Precipitation (rain/snow)	Gentle/moderate breeze 3.4 - 7.9 m/s	+5°C	Somewhat crowded	Saturday	50 km (Hafjell)	550
	Sunny	Fresh breeze > 8 m/s	-2°C	Crowded	Sunday	21 km (Skeikampen)	250
	Cloudy	Calm 0 - 0.3 m/s	-9°C	Very crowded	Monday - Wednesday	7 km (Sjusjøen)	350
2	Precipitation (rain/snow)	Calm 0-0.3 m/s	-2°C	Crowded	Thursday - Friday	21 km (Skeikampen)	250

Choice set	Weather conditions	Wind	Temperature	Crowdedness (on slopes)	Weekday	Size of the ski resort	Price (NOK)
	Sunny	Light air/light breeze 0.4–3.3 m/s	-9°C	Very crowded	Saturday	7 km (Sjusjøen)	350
	Cloudy	Gentle/moderate breeze 3.4–7.9 m/s	-16°C	A little crowded	Sunday	50 km (Hafjell)	450
3	Cloudy	Gentle/moderate breeze 3.4–7.9 m/s	-16°C	A little crowded	Sunday	21 km (Skeikampen)	450
	Bad visibility	Fresh breeze > 8 m/s	+5°C	Somewhat crowded	Monday - Wednesday	7 km (Sjusjøen)	550
	Precipitation (rain/snow)	Calm 0–0.3 m/s	-2°C	Crowded	Thursday - Friday	50 km (Hafjell)	250
4	Bad visibility	Calm 0–0.3 m/s	-16°C	Very crowded	Thursday - Friday	7 km (Sjusjøen)	450
	Precipitation (rain/snow)	Light air/light breeze 0.4–3.3 m/s	+5°C	A little crowded	Saturday	50 km (Hafjell)	550
	Sunny	Gentle/moderate breeze 3.4–7.9 m/s	-2°C	Somewhat crowded	Sunday	21 km (Skeikampen)	250
5	Precipitation (rain/snow)	Fresh breeze > 8 m/s	-16°C	Very crowded	Sunday	50 km (Hafjell)	550
	Sunny	Calm 0–0.3 m/s	+5°C	A little crowded	Monday - Wednesday	21 km (Skeikampen)	250
	Cloudy	Light air/light breeze 0.4–3.3 m/s	-2°C	Somewhat crowded	Thursday - Friday	7 km (Sjusjøen)	350
6	Cloudy	Calm 0–0.3 m/s	-9°C	A little crowded	Thursday - Friday	50 km (Hafjell)	550
	Bad visibility	Light air/light breeze 0.4–3.3 m/s	-16°C	Somewhat crowded	Saturday	21 km (Skeikampen)	250
	Precipitation (rain/snow)	Gentle/moderate breeze 3.4–7.9 m/s	+5°C	Crowded	Sunday	7 km (Sjusjøen)	350
7	Bad visibility	Fresh breeze > 8 m/s	-2°C	A little crowded	Sunday	50 km (Hafjell)	450
	Precipitation (rain/snow)	Calm 0–0.3 m/s	-9°C	Somewhat crowded	Monday - Wednesday	21 km (Skeikampen)	550
	Sunny	Light air/light breeze 0.4–3.3 m/s	-16°C	Crowded	Thursday - Friday	7 km (Sjusjøen)	250

Choice set	Weather conditions	Wind	Temperature	Crowdedness (on slopes)	Weekday	Size of the ski resort	Price (NOK)
8	Cloudy	Gentle/moderate breeze 3.4–7.9 m/s	-16°C	Crowded	Monday - Wednesday	7 km (Sjusjøen)	550
	Bad visibility	Fresh breeze > 8 m/s	+5°C	Very crowded	Thursday - Friday	50 km (Hafjell)	250
	Precipitation (rain/snow)	Calm 0–0.3 m/s	-2°C	A little crowded	Saturday	21 km (Skeikampen)	350
<b>QUESTIONNAIRE 4</b>							
1	Precipitation (rain/snow)	Calm 0–0.3 m/s	-2°C	A little crowded	Saturday	7 km (Sjusjøen)	350
	Sunny	Light air/light breeze 0.4–3.3 m/s	-9°C	Somewhat crowded	Sunday	50 km (Hafjell)	450
	Cloudy	Gentle/moderate breeze 3.4–7.9 m/s	-16°C	Crowded	Monday - Wednesday	21 km (Skeikampen)	550
2	Sunny	Calm 0–0.3 m/s	+5°C	Very crowded	Sunday	7 km (Sjusjøen)	550
	Cloudy	Light air/light breeze 0.4–3.3 m/s	-2°C	A little crowded	Monday - Wednesday	50 km (Hafjell)	250
	Bad visibility	Gentle/moderate breeze 3.4–7.9 m/s	-9°C	Somewhat crowded	Thursday - Friday	21 km (Skeikampen)	350
3	Bad visibility	Gentle/moderate breeze 3.4–7.9 m/s	-9°C	Crowded	Saturday	50 km (Hafjell)	450
	Precipitation (rain/snow)	Fresh breeze > 8 m/s	-16°C	Very crowded	Sunday	21 km (Skeikampen)	550
	Sunny	Calm 0–0.3 m/s	+5°C	A little crowded	Monday - Wednesday	7 km (Sjusjøen)	250
4	Sunny	Gentle/moderate breeze 3.4–7.9 m/s	-2°C	Somewhat crowded	Sunday	7 km (Sjusjøen)	250
	Cloudy	Fresh breeze > 8 m/s	-9°C	Crowded	Monday - Wednesday	50 km (Hafjell)	350
	Bad visibility	Calm 0–0.3 m/s	-16°C	Very crowded	Thursday - Friday	21 km (Skeikampen)	450
5	Bad visibility	Light air/light breeze 0.4–3.3 m/s	+5°C	Somewhat crowded	Sunday	7 km (Sjusjøen)	250
	Precipitation (rain/snow)	Gentle/moderate breeze 3.4–7.9 m/s	-2°C	Crowded	Monday - Wednesday	50 km (Hafjell)	350

Choice set	Weather conditions	Wind	Temperature	Crowdedness (on slopes)	Weekday	Size of the ski resort	Price (NOK)
	Sunny	Fresh breeze > 8 m/s	-9°C	Very crowded	Thursday - Friday	21 km (Skeikampen)	450
6	Precipitation (rain/snow)	Fresh breeze > 8 m/s	-16°C	A little crowded	Monday - Wednesday	7 km (Sjusjøen)	250
	Sunny	Calm 0–0.3 m/s	+5°C	Somewhat crowded	Thursday - Friday	50 km (Hafjell)	350
	Cloudy	Light air/light breeze 0.4–3.3 m/s	-2°C	Crowded	Saturday	21 km (Skeikampen)	450
7	Cloudy	Fresh breeze > 8 m/s	+5°C	A little crowded	Saturday	7 km (Sjusjøen)	350
	Bad visibility	Calm 0–0.3 m/s	-2°C	Somewhat crowded	Sunday	50 km (Hafjell)	450
	Precipitation (rain/snow)	Light air/light breeze 0.4–3.3 m/s	-9°C	Crowded	Monday - Wednesday	21 km (Skeikampen)	550
8	Sunny	Fresh breeze > 8 m/s	-9°C	Crowded	Sunday	21 km (Skeikampen)	350
	Cloudy	Calm 0–0.3 m/s	-16°C	Very crowded	Monday - Wednesday	7 km (Sjusjøen)	450
	Bad visibility	Light air/light breeze 0.4–3.3 m/s	+5°C	A little crowded	Thursday - Friday	50 km (Hafjell)	550
<b>QUESTIONNAIRE 5</b>							
1	Bad visibility	Calm 0–0.3 m/s	-16°C	Crowded	Sunday	7 km (Sjusjøen)	350
	Precipitation (rain/snow)	Light air/light breeze 0.4–3.3 m/s	+5°C	Very crowded	Monday - Wednesday	50 km (Hafjell)	450
	Sunny	Gentle/moderate breeze 3.4–7.9 m/s	-2°C	A little crowded	Thursday - Friday	21 km (Skeikampen)	550
2	Sunny	Gentle/moderate breeze 3.4–7.9 m/s	-2°C	Very crowded	Monday - Wednesday	21 km (Skeikampen)	350
	Cloudy	Fresh breeze > 8 m/s	-9°C	A little crowded	Thursday - Friday	7 km (Sjusjøen)	450
	Bad visibility	Calm 0–0.3 m/s	-16°C	Somewhat crowded	Saturday	50 km (Hafjell)	550
3	Sunny	Calm 0–0.3 m/s	+5°C	A little crowded	Monday - Wednesday	50 km (Hafjell)	250
	Cloudy	Light air/light breeze 0.4–3.3 m/s	-2°C	Somewhat crowded	Thursday - Friday	21 km (Skeikampen)	350

Choice set	Weather conditions	Wind	Temperature	Crowdedness (on slopes)	Weekday	Size of the ski resort	Price (NOK)
	Bad visibility	Gentle/moderate breeze 3.4–7.9 m/s	-9°C	Crowded	Saturday	7 km (Sjusjøen)	450
4	Sunny	Light air/light breeze 0.4–3.3 m/s	-16°C	Crowded	Thursday - Friday	50 km (Hafjell)	250
	Cloudy	Gentle/moderate breeze 3.4–7.9 m/s	+5°C	Very crowded	Saturday	21 km (Skeikampen)	350
	Bad visibility	Fresh breeze > 8 m/s	-2°C	A little crowded	Sunday	7 km (Sjusjøen)	450
5	Cloudy	Light air/light breeze 0.4–3.3 m/s	-2°C	Somewhat crowded	Thursday - Friday	50 km (Hafjell)	350
	Bad visibility	Gentle/moderate breeze 3.4–7.9 m/s	-9°C	Crowded	Saturday	21 km (Skeikampen)	450
	Precipitation (rain/snow)	Fresh breeze > 8 m/s	-16°C	Very crowded	Sunday	7 km (Sjusjøen)	550
6	Cloudy	Fresh breeze > 8 m/s	+5°C	Crowded	Thursday - Friday	21 km (Skeikampen)	250
	Bad visibility	Calm 0–0.3 m/s	-2°C	Very crowded	Saturday	7 km (Sjusjøen)	350
	Precipitation (rain/snow)	Light air/light breeze 0.4–3.3 m/s	-9°C	A little crowded	Sunday	50 km (Hafjell)	450
7	Bad visibility	Calm 0–0.3 m/s	-16°C	Somewhat crowded	Saturday	21 km (Skeikampen)	550
	Precipitation (rain/snow)	Light air/light breeze 0.4–3.3 m/s	+5°C	Crowded	Sunday	7 km (Sjusjøen)	250
	Sunny	Gentle/moderate breeze 3.4–7.9 m/s	-2°C	Very crowded	Monday - Wednesday	50 km (Hafjell)	350
8	Sunny	Fresh breeze > 8 m/s	-9°C	Very crowded	Thursday - Friday	7 km (Sjusjøen)	450
	Cloudy	Calm 0–0.3 m/s	-16°C	A little crowded	Saturday	50 km (Hafjell)	550
	Bad visibility	Light air/light breeze 0.4–3.3 m/s	+5°C	Somewhat crowded	Sunday	21 km (Skeikampen)	250
<b>QUESTIONNAIRE 6</b>							
1	Cloudy	Fresh breeze > 8 m/s	+5°C	Somewhat crowded	Monday - Wednesday	7 km (Sjusjøen)	450

Choice set	Weather conditions	Wind	Temperature	Crowdedness (on slopes)	Weekday	Size of the ski resort	Price (NOK)
	Bad visibility	Calm 0–0.3 m/s	-2°C	Crowded	Thursday - Friday	50 km (Hafjell)	550
	Precipitation (rain/snow)	Light air/light breeze 0.4–3.3 m/s	-9°C	Very crowded	Saturday	21 km (Skeikampen)	250
2	Sunny	Light air/light breeze 0.4–3.3 m/s	-16°C	A little crowded	Saturday	50 km (Hafjell)	350
	Cloudy	Gentle/moderate breeze 3.4–7.9 m/s	+5°C	Somewhat crowded	Sunday	21 km (Skeikampen)	450
	Bad visibility	Fresh breeze > 8 m/s	-2°C	Crowded	Monday - Wednesday	7 km (Sjusjøen)	550
3	Precipitation (rain/snow)	Gentle/moderate breeze 3.4–7.9 m/s	+5°C	Very crowded	Thursday - Friday	50 km (Hafjell)	450
	Sunny	Fresh breeze > 8 m/s	-2°C	A little crowded	Saturday	21 km (Skeikampen)	550
	Cloudy	Calm 0–0.3 m/s	-9°C	Somewhat crowded	Sunday	7 km (Sjusjøen)	250
4	Sunny	Fresh breeze > 8 m/s	-9°C	Somewhat crowded	Saturday	21 km (Skeikampen)	550
	Cloudy	Calm 0–0.3 m/s	-16°C	Crowded	Sunday	7 km (Sjusjøen)	250
	Bad visibility	Light air/light breeze 0.4–3.3 m/s	+5°C	Very crowded	Monday - Wednesday	50 km (Hafjell)	350
5	Precipitation (rain/snow)	Gentle/moderate breeze 3.4–7.9 m/s	+5°C	Crowded	Sunday	50 km (Hafjell)	350
	Sunny	Fresh breeze > 8 m/s	-2°C	Very crowded	Monday - Wednesday	21 km (Skeikampen)	450
	Cloudy	Calm 0–0.3 m/s	-9°C	A little crowded	Thursday - Friday	7 km (Sjusjøen)	550
6	Cloudy	Calm 0–0.3 m/s	-9°C	Very crowded	Monday - Wednesday	50 km (Hafjell)	350
	Bad visibility	Light air/light breeze 0.4–3.3 m/s	-16°C	A little crowded	Thursday - Friday	21 km (Skeikampen)	450
	Precipitation (rain/snow)	Gentle/moderate breeze 3.4–7.9 m/s	+5°C	Somewhat crowded	Saturday	7 km (Sjusjøen)	550



Choice set	Weather conditions	Wind	Temperature	Crowdedness (on slopes)	Weekday	Size of the ski resort	Price (NOK)
7	Precipitation (rain/snow)	Light air/light breeze 0.4–3.3 m/s	-9°C	A little crowded	Sunday	21 km (Skeikampen)	450
	Sunny	Gentle/moderate breeze 3.4–7.9 m/s	-16°C	Somewhat crowded	Monday - Wednesday	7 km (Sjusjøen)	550
	Cloudy	Fresh breeze > 8 m/s	+5°C	Crowded	Thursday - Friday	50 km (Hafjell)	250
8	Bad visibility	Fresh breeze > 8 m/s	-2°C	Very crowded	Saturday	50 km (Hafjell)	250
	Precipitation (rain/snow)	Calm 0–0.3 m/s	-9°C	A little crowded	Sunday	21 km (Skeikampen)	350
	Sunny	Light air/light breeze 0.4–3.3 m/s	-16°C	Somewhat crowded	Monday - Wednesday	7 km (Sjusjøen)	450

*Note:* Orthogonal design was created using the DoE.Base package in R statistical software.

## Appendix B

### An Example of One CBC Question (Text in Norwegian)

Question: Below are various ski day scenarios. The scenarios are based on different weather conditions, day in a regular week, type of resorts, amount of people on the ground and price.

Choose the option you prefer. If you would not have been skiing / snowboarding in any of the scenarios, select: "None of the options (in Norwegian *Ingen av alternative*)

 <p>Veldig mye folk (Se bilde)</p> <p>Ukedag: Lørdag</p> <p>250 NOK</p>	 <p>-16°C</p> <p>Lettl/laber bris 3,4-7,9 m/s</p>	 <p>Lite folk (Se bilde)</p> <p>Ukedag: Søndag</p> <p>350 NOK</p>	 <p>5°C</p> <p>Frisk bris 8-10,7 m/s</p>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
 <p>En del folk (Se bilde)</p> <p>Ukedag: Man-ons</p> <p>450 NOK</p>	 <p>-2°C</p> <p>Vindstille 0-0,3 m/s</p>	<div style="border: 1px solid black; padding: 10px; text-align: center;">Ingen av alternativene</div>	
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	