

Nineteenth International Conference on  
**Environmental, Cultural, Economic & Social Sustainability**

**Decentering Sustainability:** Towards Local Solutions for Global Environmental Problems

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Title: Changing Climate, Virtual Skiscapes: Decentering communities of practice

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**Abstract:**

By engaging in outdoor sports and activities, people develop communities of practice that imbue landscapes with cultural meanings. Communities of practice that engage in winter sports, such as Nordic skiing, are especially vulnerable to the effects of climate change as winters grow shorter and warmer. Social distancing in response to COVID-19 decentered community engagement with cultural landscapes as many cross-country ski events created virtual options for participating in novel forms of citizen races. Examples include skiing at alternative venues, or substituting another activity (e.g., running, cycling, swimming) in place of skiing. An anonymous survey of 1300 cross-country skiers provides multifaceted data on how virtual participation in otherwise in-person events affected perceptions of culture and community at various social and geographic scales. This research evaluates an adaptive local solution for dealing with global climate change. While dispersed virtual events may provide local solutions to lack of snow, they may also disrupt the connection between human behavior, cultural landscapes, and meaning. Adapting to shorter and warmer winters by relying on virtual participation in ski events creates the added danger of masking the effects of climate change by allowing the culturally sanctioned substitution of one appropriate “skiscape” for another.

**Key Words:** Climate Change, Cultural Landscape, Community, Nordic Skiing

## Introduction

**(Title Slide 1)** As society develops adaptive strategies for dealing with climate change, we must be careful to avoid masking the long-term outcomes of those decisions. When people do not personally experience the negative effects of climate change, it is easier to ignore the crisis because it is hard to relate to one's own life (Chen et al 2019). If short-term adaptations disassociate humans from the very landscapes that are negatively impacted by increased warming, it will be harder to establish long-term solutions.

The detrimental effects of global warming on winter sports and active sport tourism has recently emerged as an important area of research (Dingle and Stewart 2018; Orr 2020; Orr and Inoue 2019; Orr and Schneider 2018; Ross and Orr 2022). The current paper adds to this body of work through an anthropological lens focused on the sustainability of cross-country ski community and culture in light of climate change and landscape. *Sustainability* can be measured through various attributes and in order to determine if an adaptation is sustainable, we must identify key relationships between specific variables and examine those at multiple scales (Moran 2010).

## Communities of Practice & Cultural Landscapes

**(Slide 2)** The Nordic ski community provides an excellent case study to examine the dynamic and reciprocal relationship between climate change and culture. The Upper Midwest of the United States has a widespread tradition of Nordic skiing and winter festivals. Major citizen races such as the American Birkebeiner, Vasaloppet USA, City of Lakes Loppet and many others attract tens of thousands of skiers to the same places year after year. The open registration that allows anyone to participate, combined with the energetic atmosphere surrounding the events, provides the context for the creation of community.

**(Slide 3)** People develop *communities of practice* by engaging in specific outdoor activities with defined rules, norms, and constraints on the range of behaviors. When these shared behaviors occur in the same space, *cultural landscapes* may be constructed. This results when shared meanings are associated with specific physical and natural elements that convert a neutral "space" into a meaningful "place." Cultural landscapes *might* include physical alterations such as trails, structures, and buildings, but may also consist solely of intangible meanings associated with distinct natural elements (Basso 1996; Darvill 1999; Layton and Ucko 1999; Strang 2008; Tilley and Cameron-Daum 2017). The ways in which landscape is imbued with meaning occurs at multiple scales and through myriad processes with organic 'grass roots' communities at one end of the continuum and official government narratives at the other (McDowell 2008; Russel 2010).

**(Slide 4)** An important element of building community and cultural meaning is the *camaraderie* developed among a group that participates in a physically demanding activity under challenging environmental conditions. The emergent shared experiences of the group create the context for developing *cultural currency* that is later used by members of the community. Following the

event, community members spend their cultural currency through talking about and creating stories of what occurred. Participants in this process add social capital to the co-generated stories through mutual affirmation of the event and modification of the details based on their personal lived experience of the same day at the same place. It is through a kind of “narrative triangulation” that event lore is layered on to the cultural landscape and the community constructs meaning. One outcome is that sections of race courses or trails take on names and develop reputations with specific attributes. For endurance events such as ski races, the unique landscape and environmental conditions of the day play crucial roles in the physical experience and authentic co-creation of meaning.

**(Slide 5)** Citizen ski races that cover marathon distances through sometimes adverse weather conditions, provide shared physical experiences through winter landscapes that are revisited year after year. The fact that the physical activity, shared experience, and derived meanings *must* occur on a substrate of snow that has been specifically groomed, and sometimes produced, for the very purpose of holding the events, results in a special kind of landscape that we have dubbed a “skiscape.” The *skiscape* is a unique type of cultural landscape that results from the ephemeral combination of season of the year, climate and weather patterns, human behavior, and cultural meaning. When climate change negatively impacts a skiscape, members of the associated community will need to adapt. Adaptations include maintaining a connection to the skiscape and committing to action that will counter the negative effects, but also include disassociating from the cultural landscape.

### **Virtual Racing & Climate Change**

**(Slide 6)** During the winter of 2020-2021, cross-country race organizers sought to maintain continuity of events while preventing transmission of the COVID-19 virus. “Virtual racing” was one of the short-term adaptive strategies. Virtual races allowed skiers to use the official course over multiple days to avoid gathering in large crowds, as well as ski completely different courses located in different states. Skiers self-reported their final time to receive recognition for participating in the “official race”. The online social sports platform Strava was widely used to document and report virtual race times. Strava members create named trail segments that record the speed and time of a person’s performance on the segment. The results are then archived on a perpetual “Leaderboard” that shows how the individual compares to anyone else who has ever recorded a time on the same segment.

**(Slide 7)** In the most liberal definition of a virtual event, the American Birkebeiner Ski Foundation (ABSF) allowed participants to roller ski, run, swim, bike, row, hike, and even cross-country ski on a sandy California beach (but they were not allowed to use gaming or E-sports activities). With each of these virtual options, the Nordic ski community became further removed from the skiscapes that were originally associated with the in-person events. Allowing non-ski activities to count as fulfilling the 2021 Birkie was especially significant given that the American Birkebeiner is the largest cross-country ski race in North America and is often considered the ‘gold standard’ for other ski events and festivals. Aside from the questions

around how virtual races may redefine fair play in sport, the short-term adaptation they offered may have long-term ripple effects.

**(Slide 8)** Although the health threat of COVID-19 is waning, some Nordic race organizers are still offering virtual alternatives in 2023 and many could easily use virtual events as an adaptive strategy to deal with warmer winters in the near term. The ABSF, Vasaloppet USA, and the City of Lakes Loppet all employ artificial snow making as a way to maintain the skiscapes of their hallmark courses. Research on infrastructural adaptations to climate change throughout Europe and the Northeastern United States documents that artificial snow making is already relied upon as an adaptive strategy and will only continue to grow over the coming decades (Landauer et al. 2012; Pröbstl et al. 2008; Scott et al. 2008). However, climate trends indicate that snow making will not be a feasible solution for all skiscapes in the near future (Scott et al. 2008). Thus, it is an adaptive advantage for organizers to use virtual alternatives to keep the public engaged with their hallmark events in order to promote their corporate sponsors and generate race registration fees and annual membership fees to remain fiscally solvent.

**(Slide 9)** Ski race organizers are grappling with environmental responsibility at multiple scales. The International Ski and Snowboard Federation (FIS), that governs professional World Tour cross-country ski racing, signed the Sports for Climate Action Framework to generate broader climate awareness and global action through winter sports with a plan to achieve net-zero emissions by 2040 (International Ski and Snowboard Federation 2021). The nonprofit U.S. organization Protect Our Winters (POW) motivates snow sport enthusiasts to lobby state and federal governments to enact climate-positive legislation. POW recognizes that meaningful *cultural change* within the U.S. is required to make the long-term structural changes necessary to limit global warming (Protect Our Winters 2022). And this is a concern in the Upper Midwest as well. After securing corporate sponsorship from Enbridge Energy, that operates oil and gas pipelines from Canada to the U.S., the ABSF abruptly ended the partnership due to environmental objections by its members and the larger cross-country ski community (Star Tribune 2021).

Ski event organizers are pressured to remain fiscally solvent while upholding longstanding cultural traditions, and doing so with environmentally responsible practices. Yet, the ski community increasingly recognizes the carbon footprint resulting from long distance travel to venues just to race for a day. The cultural stage is becoming set for cross-country ski behaviors to evolve. If race organizers rely on virtual events as an adaptation to these economic and cultural pressures, what are the potential impacts to the Nordic ski community and to the relationships between this community and their cultural skiscapes?

### **Survey Results: Community and Culture**

**(Slide 10)** With approval from the Institutional Review Board at St Cloud State University, partnership with the ABSF and the Stearns and Wright County Parks departments, and assistance from the City of Lakes Loppet Foundation, the authors distributed an anonymous

online survey that was made available to thousands of Nordic skiers throughout the Upper Midwest during the 2020-2021 winter ski season. 1300 respondents took the survey. Based on cell tower locations used to access the survey, respondents represent 47 states across the US, five provinces of Canada, and Norway and England. The survey collected a wide range of data. The results presented here focus on the “likes” and “dislikes” of virtual racing and what this implies for adaptations to climate change.

**(Slide 11)** Demographically, the population of survey respondents is much older, more highly educated, and earns a higher annual income than national medians and averages for the U.S. in 2021. Two-thirds self-identified as male or masculine and fewer than 2% reported a racial description that did not include White or Caucasian. This demographic is *not* statistically representative of the U.S. population, however, it is similar to that reported in other studies of active endurance sport tourism (Myburgh et al 2018, 2019).

**(Slide 12)** As one might expect from a COVID-based disruption to long standing traditional practices, many people reacted negatively to the virtual adaptation. Survey respondents shared 613 things they *disliked* about virtual races. The single most common dislike (27%) was the lack of race community, comradery and spectators that are normally present at in-person events. 16% of virtual participants disliked the lack of atmosphere, energy and excitement that comes with head-to-head racing, and 14% missed the traditional social events and festivities that occur during the races. 11% of respondents felt that virtual events were not “real racing”. The top three dislikes represent over half of all complaints and underscore the great significance of socialization and community building that occurs at these events. Of special note, only 7% of respondents who participated in a virtual event disliked the fact that they did not ski on the actual race course. This relatively small proportion represents the people who missed the personal association with the authentic skiscape. *The remaining 93% did not mention this as problematic.* These results indicate that the perpetuation of culture and community may be a higher priority than the perpetuation of a specific skiscape. If virtual events disrupt the traditional, in-person festivities and atmosphere surrounding citizen races, will this be enough to motivate personal action that responds to increasingly warmer winters?

**(Slide 13)** Contrary to the dislikes, survey respondents shared a total of 864 things they *liked* about the virtual options. 31% of the respondents liked the flexibility to choose either the time or place where they conducted their virtual race. Many people in the Nordic ski community were quite satisfied with substituting an authentic race skiscape for somewhere else that was usually local. 10% of respondents liked the reduced social stress that came from the lack of crowds and race intensity of the in-person events, and another 10% were generically supportive of virtual events overall. Improved COVID safety was liked by 9% of respondents, but this barely exceeds the 8% of respondents who appreciated the reduced logistical stress associated with travel and choosing equipment. Virtual racing maintained an actual sense of community for 6% of the respondents because event organizers provided commemorative items such as race bibs, hats, and T-shirts.

When comparing the number of likes (864) to dislikes (613), the intangible qualities of community, comradery, atmosphere, energy, and shared cultural experience are the most important elements missing from a virtual race. On the other hand, the tangible structural elements of flexibility in time and place, and easier travel and race logistics are strongly mitigating factors in favor of the virtual adaptation. And for some people, the virtual events even maintained a sense of community.

Our results indicate that if a sense of community and festival atmosphere or excitement is maintained, many cross-country skiers will gladly substitute an authentic race for a virtual alternative because of the more flexible structure and less costly and stressful logistics involved. This highlights the delicate balance between human social needs and material constraints. But lest we forget about culture and how it weaves everything together. Will decentralizing in-person events through the use of virtual alternatives erode the larger sense of Nordic ski culture? In a word, no.

**(Slide 14)** Survey respondents were provided a list of 7 different ways in which they might participate in cross-country ski culture, and also wrote their own ideas. Ranked from most to least common they: ski in winter, wax their own skis, participate in organized ski events, wear clothing made by ski brand companies, follow print/online ski news and professional and Olympic races, and ski as a way to participate in Scandinavian culture. Of the 210 written responses, the most common was coaching/teaching, followed by socializing with friends/family, grooming/trail maintenance, and training in preparation of races. Of the written responses, only “grooming/trail maintenance” regularly connects people to specific skiscapes.

We looked for discrepancies in how people participate in cross-country ski culture by comparing those who skied the most with those who skied the least. Analysis of the response frequencies for the 7 culture categories analyzed people who ski more than 3 times per week against those who ski less than once per week, and found *no statistically significant difference* ( $\chi^2 = 3.28$ ;  $p = 0.773$ ). And, there were many people in both of these groups who considered themselves “year round” cross-country skiers. Our data indicate that the frequency of participation in the sport does not predict the degree to which individuals self-identify with the activity or culture. This has obvious negative implications under a climate scenario of increasingly warmer winters. If people ski less because of the effects of climate change, many will make this adaptation and still consider themselves “cross-country skiers” who engage in the culture, even if sporadically. In this case, the flexibility of human culture and wide latitude for quick adaptive responses works *against* the personal motivation to make long-term changes needed to counteract current climate trends.

### **Theoretical Implications**

**(Slide 15)** Human culture simultaneously evolves at different scales and speeds. Short-term decisions can result in adaptations with long-term consequences. Selective pressures are acting upon cross-country ski event organizers to maintain economic solvency while reducing their

carbon footprints. Cross-country skiers identified both social and material needs that select for meaningful engagement with community and culture, while also simplifying their logistical scheduling and travel requirements.

If event organizers integrate virtual races as a regular strategy to adapt to climate change, we expect a significant portion of current cross-country skiers *will participate* and there will be both positive and negative results. In the short-term, the organization will preserve its public image and positive association with the culture and may even see initial growth through spreading its market share into new regions by partnering with distant venues to host virtual events. The primary economic costs will be the initial investment in building the long-distance partnerships, plus the hit taken by the local community that previously benefitted from the seasonal revenue. The cumulative effects may act to further decenter the organization from its home community.

The short-term benefits to the virtual event participants include a reduced carbon footprint and staying physically active. However, maintaining community will require concerted effort through social media as people engage with diverse and distant landscapes and may even substitute different sports. The lack of camaraderie will be a very difficult long-term challenge to overcome. At a regional scale, communities and group identity may devolve to a shared material culture expressed in clothing or equipment. The original event organization will need to promote its brand, rather than its race, as the primary linkage among community members.

**(Slide 16)** If global warming continues to increase and a venue is no longer able to host their hallmark ski race, one of the long-term outcomes will be a loss of association between the skiscape and the community that originally defined it. While people can still run, hike, or bike the trails previously used for skiing, the cultural skiscape itself will cease to exist. If the organization is to survive, the long-term adaptation should include non-snow sports that utilize the same physical landscape and actively foster a “re-creation” of new cultural associations. Many places in the U.S. and Europe are primed for this as winter-sport centers and ski resorts have already expanded to include warm season activities in order to attract tourists year round (e.g., Frühauf et al 2020). Even if we consider activity diversification as a neutral adaptation that would have happened without climate change, we cannot ignore the important role it plays in the cultural, and ultimately environmental, processes examined in this research.

**(Slide 17)** The long-term results of skiers regularly participating in local, virtual versions of what were formally large regional races could have significant collective impact. With less travel to hallmark events such as the American Birkebeiner and US Vasaloppet, individuals will produce a smaller carbon footprint. The geographic scale of the Midwestern US cross-country ski community will likely contract and we would expect to see evidence of cultural regionalization. Many people may stop skiing altogether (Witting et al 2019). Perhaps most importantly, the total cumulative impact of substituting local landscapes *with snow* for former skiscapes *without snow* lessens the need for many people in the cross-country ski community to directly confront the ongoing impacts of climate change. This will reduce or delay motivation to act (Chen et al

2019) on behalf of protecting the very skiscapes that serve as powerful binding forces for development of regional community and culture. Therefore, we must be very cognizant of successful short-term adaptations that decentralize a community's interaction with special cultural landscapes. Such adaptations can erode the community itself, while also being counterproductive to achieving more substantial, long-term structural changes.



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# Changing Climate, Virtual Skiscapes: Decentering communities of practice

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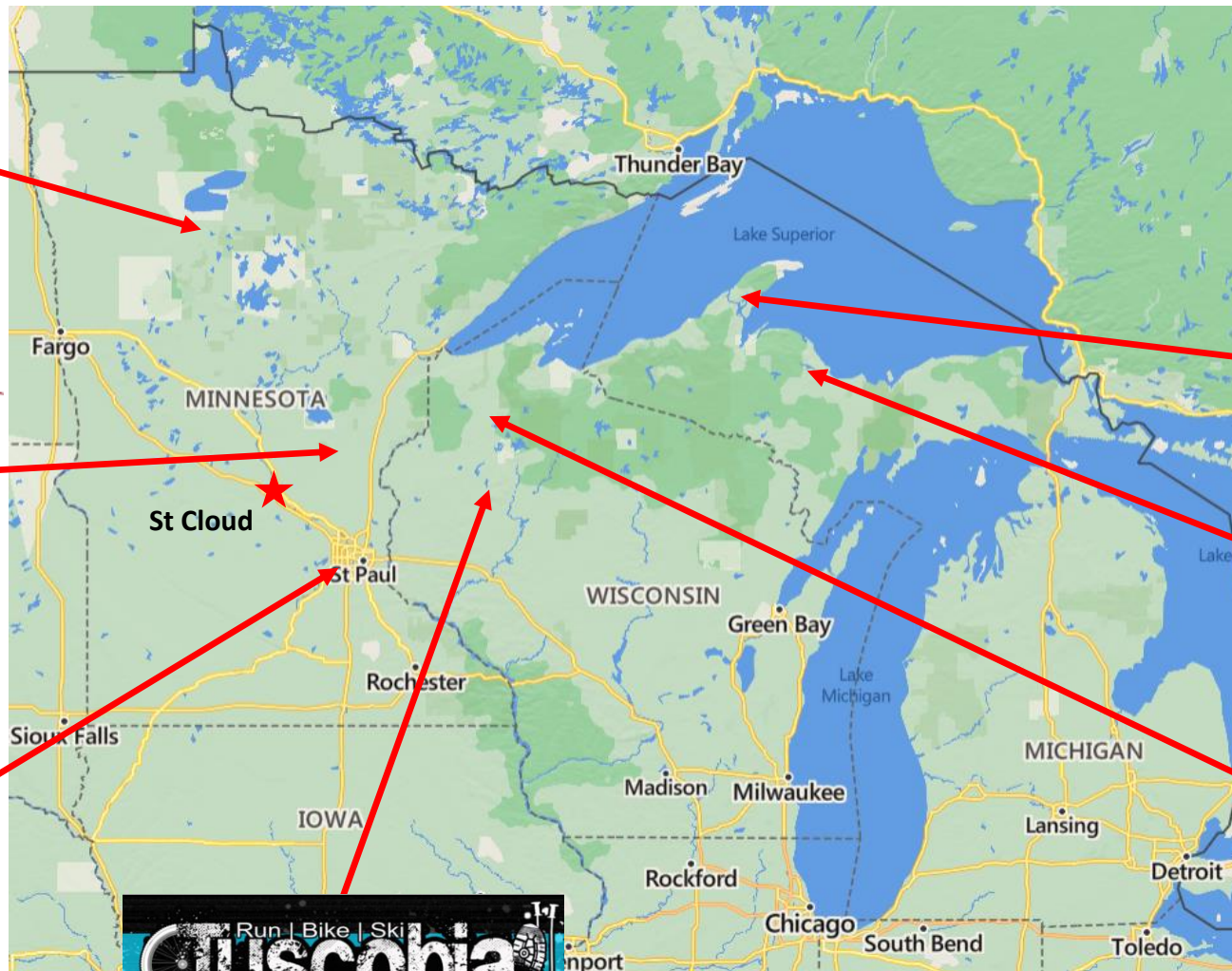
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# Communities of Practice & Cultural Landscapes





# Communities of Practice & Cultural Landscapes



Moonlight Ski Community Event, Quarry Park  
Nordic Ski Club of Central Minnesota



Luminary Loppet, Lake of the Isles  
City of Lakes Loppet Foundation, Minnesota



# Camaraderie



Thousands of skiers ascend Mt. Telemark at the start of the 1979 **American Birkebeiner**. Today, over 10,000 skiers take part in the annual event.

© Bruce Fritz

← **Vasaloppet USA**  
1,354 Tweets Follow

 **Vasaloppet USA** @VasaloppetUSA · Feb 4, 2012 ...  
Despite the race being canceled, organizers are still enjoying the planned "memories" event tonight



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# “Skiscape”

## Ephemeral combination

- season (winter)
- climate & weather (snow)
- human behavior (XC ski)
- cultural meaning

1,000s of xc skiers climb Mount Telemark at the start of the 1978 American Birkebeiner in the inaugural year of the Worldloppet. © Bruce Fritz







# Virtual Racing & Climate Change

← **American Birkebeiner** Follow

5,108 Tweets



**American Birkebeiner** @birkie · Mar 5, 2021

Jon before & after his virtual Birkie at Snow Mtn. Ranch in CO. We love what he had to say, "Also thought about all of you doing your Birkies in different venues and how cool it was that we were somehow cosmically connected and in this together even though physically distant."



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← **Vasaloppet USA** Follow

1,354 Tweets



**Vasaloppet USA** @VasaloppetUSA · Dec 13, 2020

2021 virtual ski race option. Ski the race at your convenience on any trail, anytime between January 30th - February 14th. See complete details right here: [vasaloppet.us/2020/12/2021-v...](https://vasaloppet.us/2020/12/2021-v...)

## 2021 Vasaloppet USA Virtual Event Option



**Ski the race at your convenience, on the trails of your choice, anytime between Jan. 30 - Feb. 14**

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# Virtual Racing & Climate Change

YouTube search: sand skiing birkie

Sand Skiing the Virtual Birkie (A Los Angeles Ski Marathon)

**American Birkebeiner**  
5,108 Tweets

**American Birkebeiner** @birkie · Mar 18, 2021  
During Birkie week, Professor Dan roller-skied his way to the virtual Birkie finish line on Beach Drive in Rock Creek Park in Washington D.C. Dan witnessed others completing their Birkie & Korte races, all proudly sporting their bibs. That's the Birkie spirit! #VirtualBirkie

**American Birkebeiner**  
5,108 Tweets

**American Birkebeiner** @birkie · Feb 26, 2021  
Joe is a rower for Purdue University (crew) and he rowed his Birkie in under 4-hours! What a feat! #VirtualBirkie Thanks for sharing your photos! Please keep us posted and tag us! #VirtualBirkie #Birkie2021



# Virtual Racing & Climate Change

← **Vasaloppet USA** 1,354 Tweets **Follow**

 **Vasaloppet USA** @VasaloppetUSA · Feb 7, 2015 ...

The first-ever Lake Mora Vasaloppet is a success. With no snow, we ad lib and pull together a ski race.



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Minnesota

## Vasaloppet ski race celebrates its 50th year in Mora

Dan Kraker Duluth February 6, 2022 2:48 PM

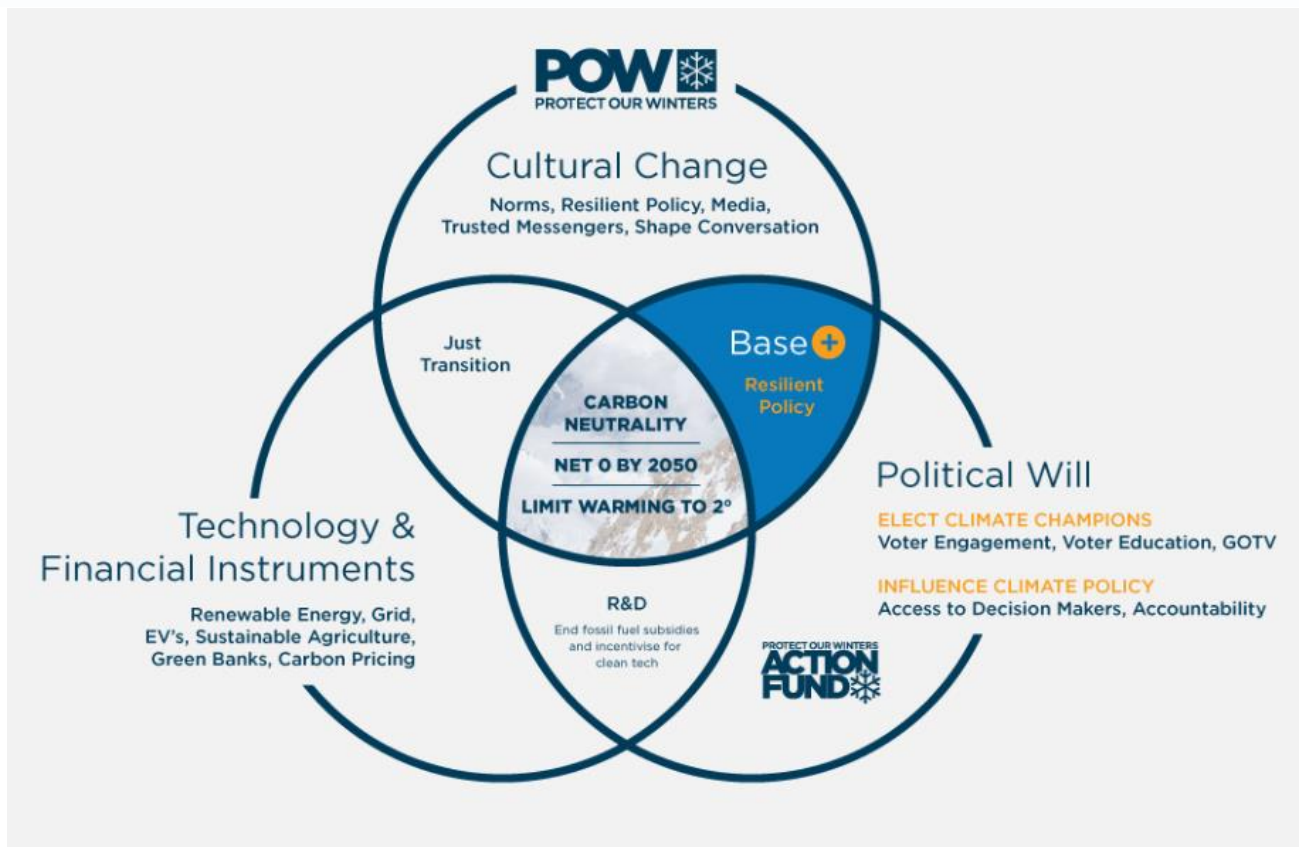


A giant pile of artificially made snow awaits transport to the course of the annual Vasaloppet USA cross-country ski race near Mora, Minn. Volunteers haul it with manure spreaders on to the trail, to ensure that the race will go on despite the trend of warmer winters and inconsistent snowfall. 🏔️ Courtesy of Jon Larson

<https://www.mprnews.org/story/2022/02/06/vasaloppet-ski-race-celebrates-its-50th-year-in-mora>



# Virtual Racing & Climate Change



Star Tribune ✓ @StarTribune · Jan 12, 2021

The **American Birkebeiner Ski Foundation**, which puts on the popular Birkie **ski** and trail events in northwestern Wisconsin, said it cut ties with sponsor Enbridge Energy.



startribune.com

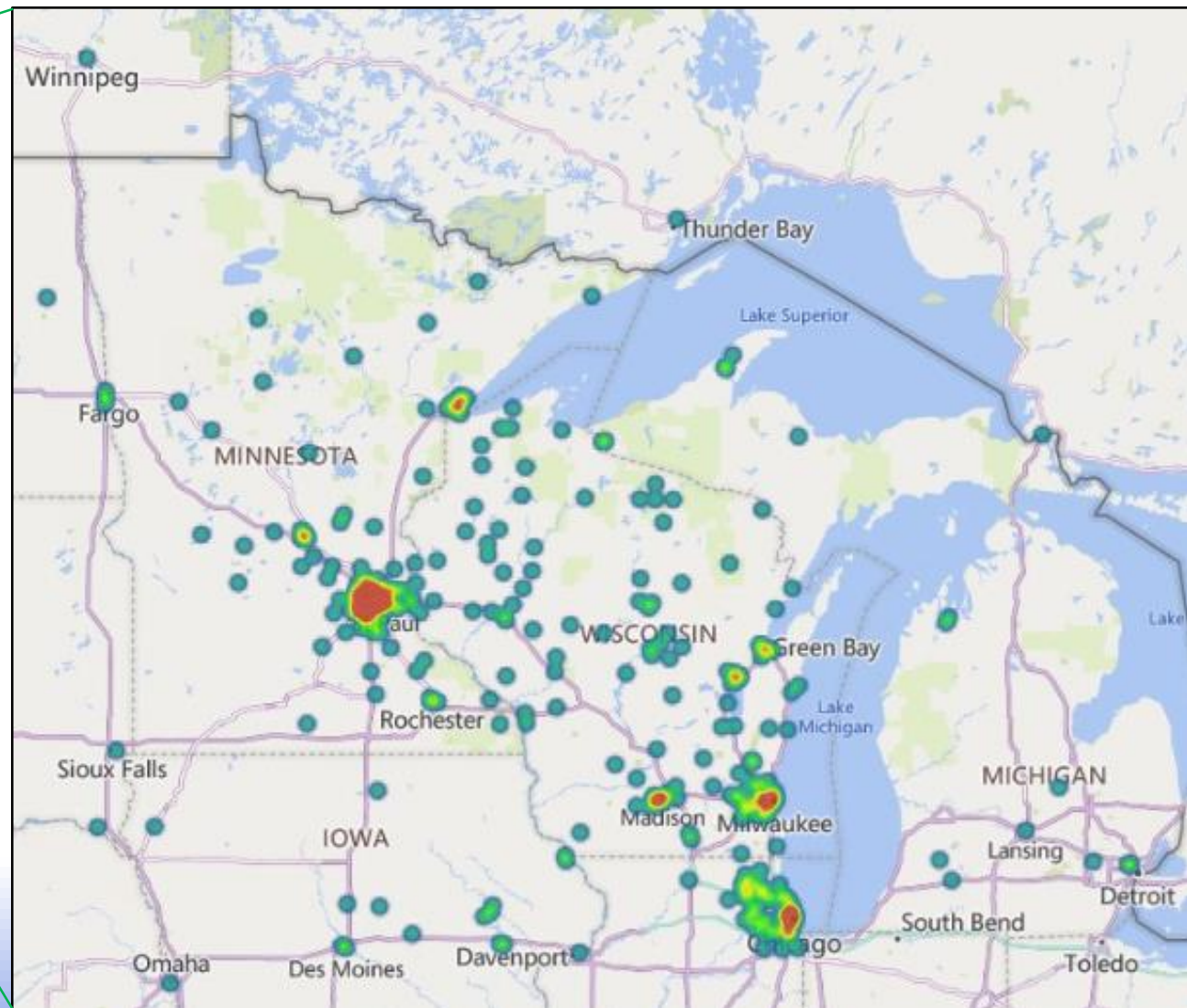
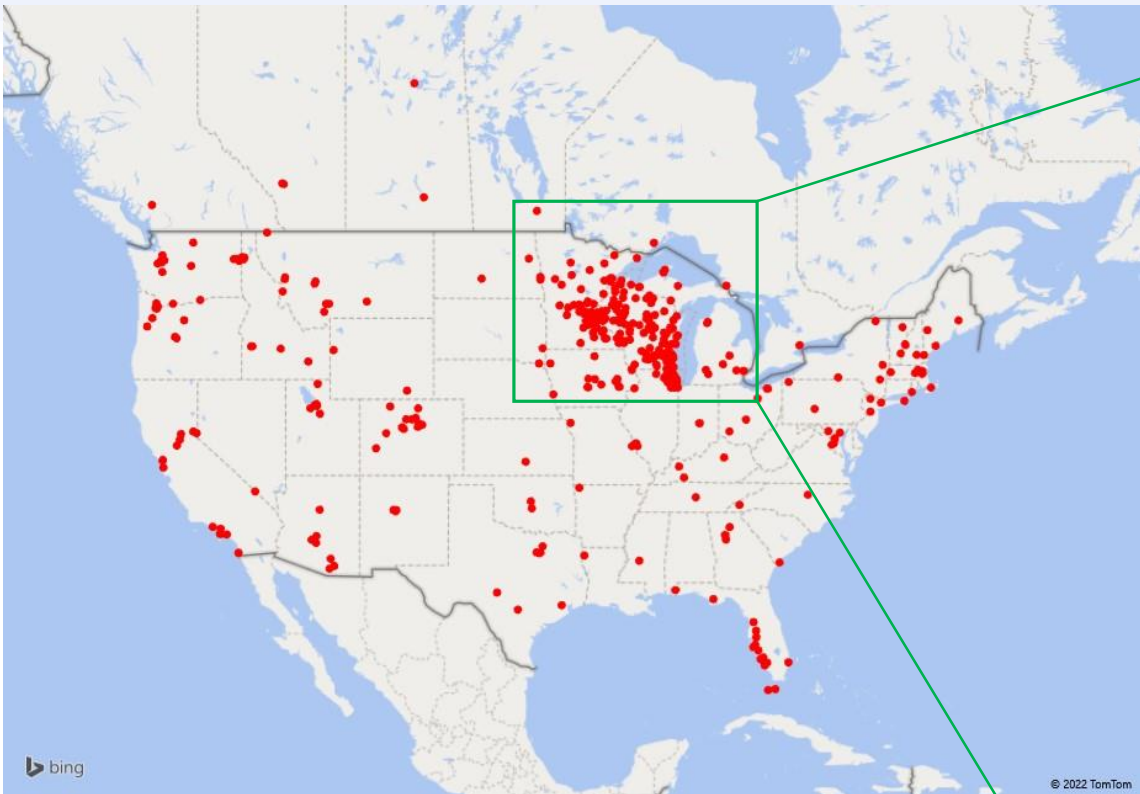
Birkie foundation cuts ties with sponsor Enbridge Energy

The group that runs the popular ski and trail races says 'Birkie community' raised concerns.





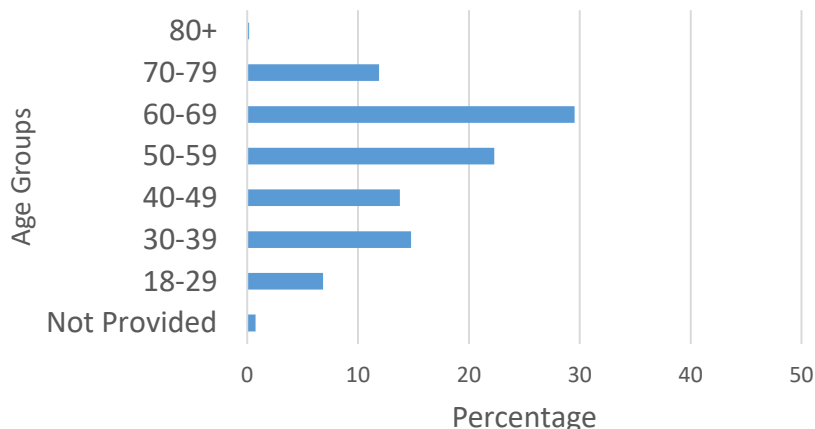
# Survey Results: Community & Culture





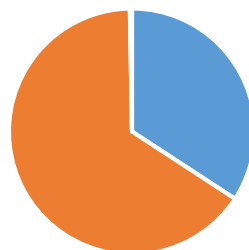
# Survey Results: Demographics

### Distribution of Age



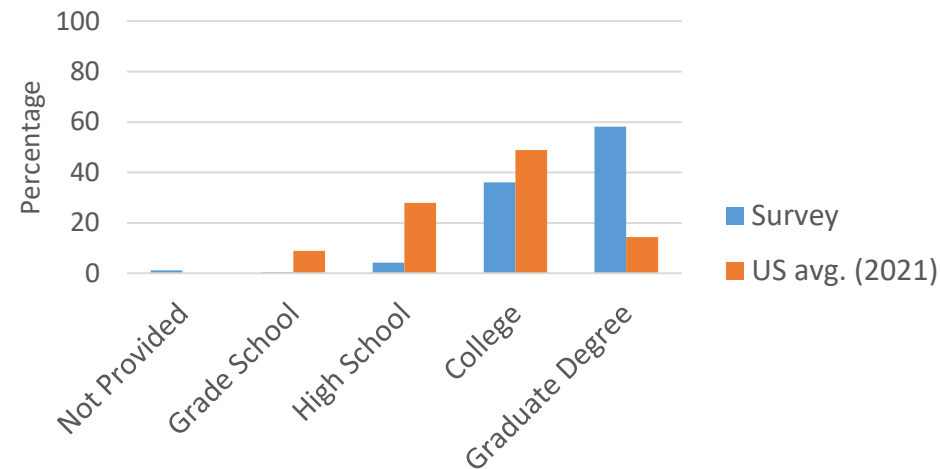
US median age (2021) = 38.8

### Gender

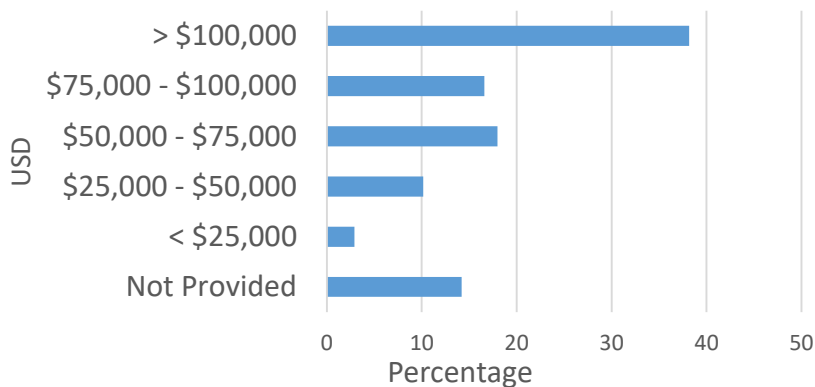


- Female/Feminine
- Male/Maculine
- GNC/Non-Binary

### Level of Education

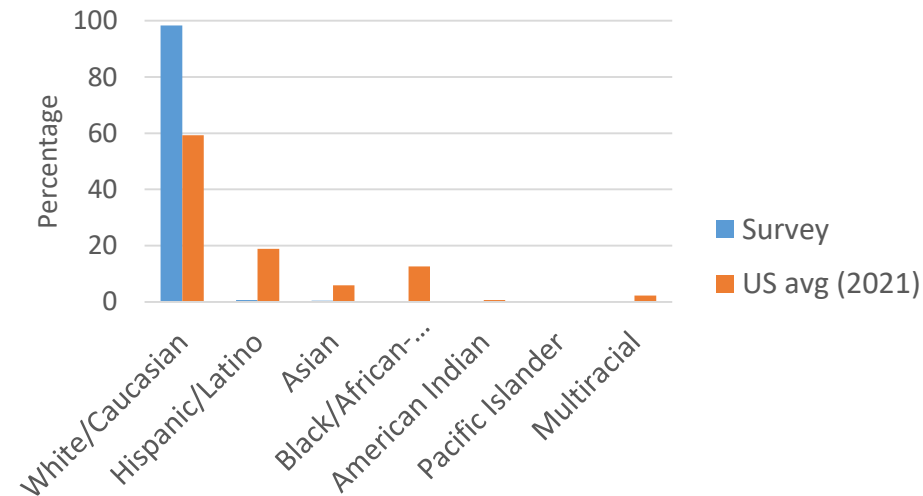


### Annual Income



US median all household income (2021) = \$70,784

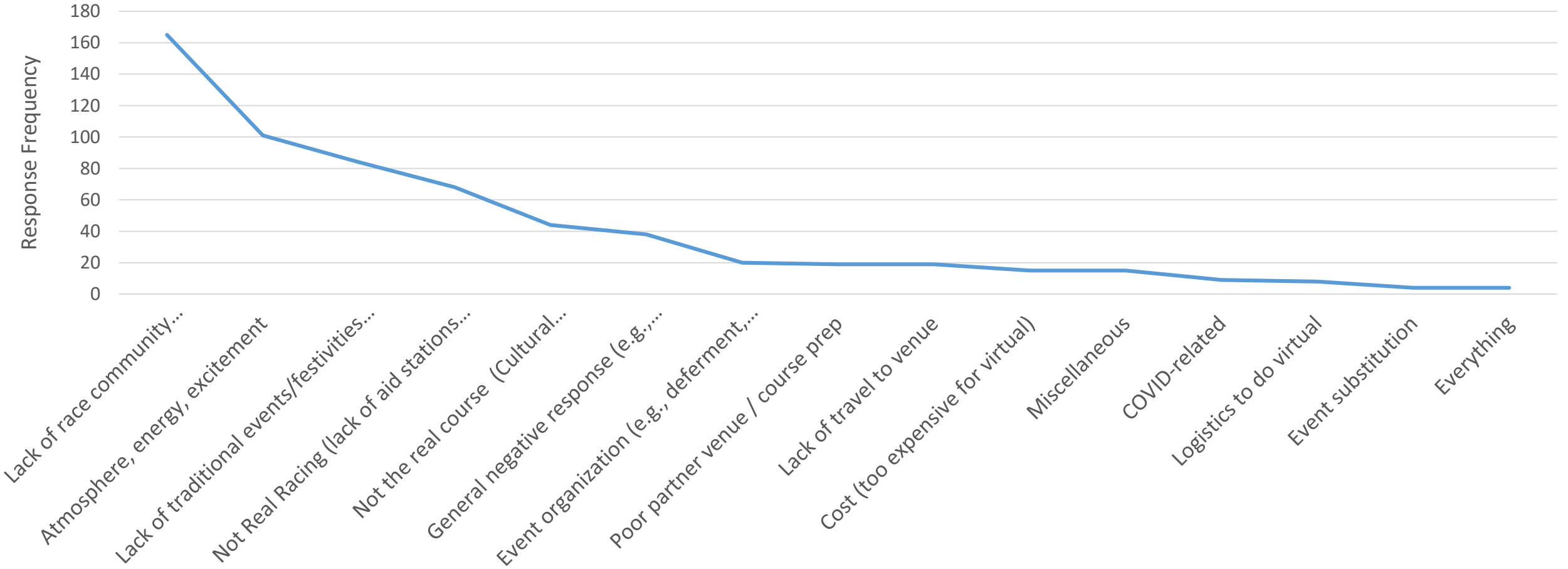
### Racial Distribution





# Survey Results: Likes & Dislikes

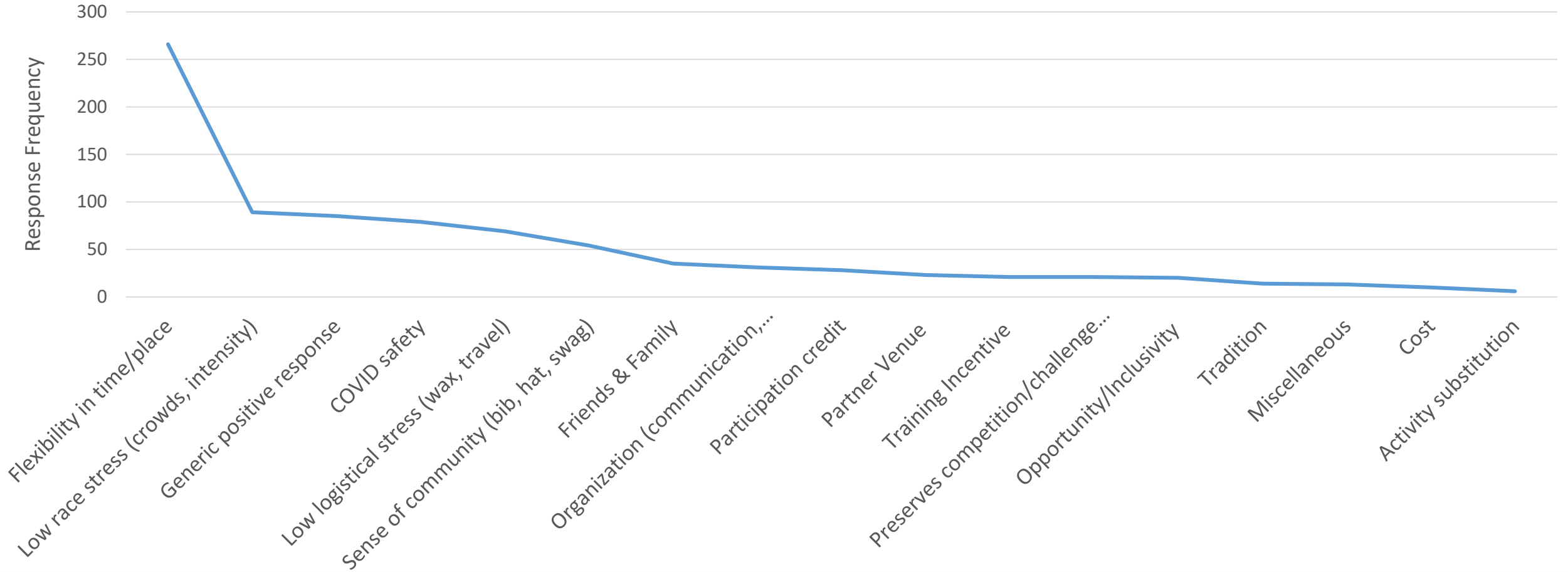
## Virtual "Dislikes" (n = 613)





# Survey Results: Likes & Dislikes

Virtual "Likes" ( $n = 864$ )

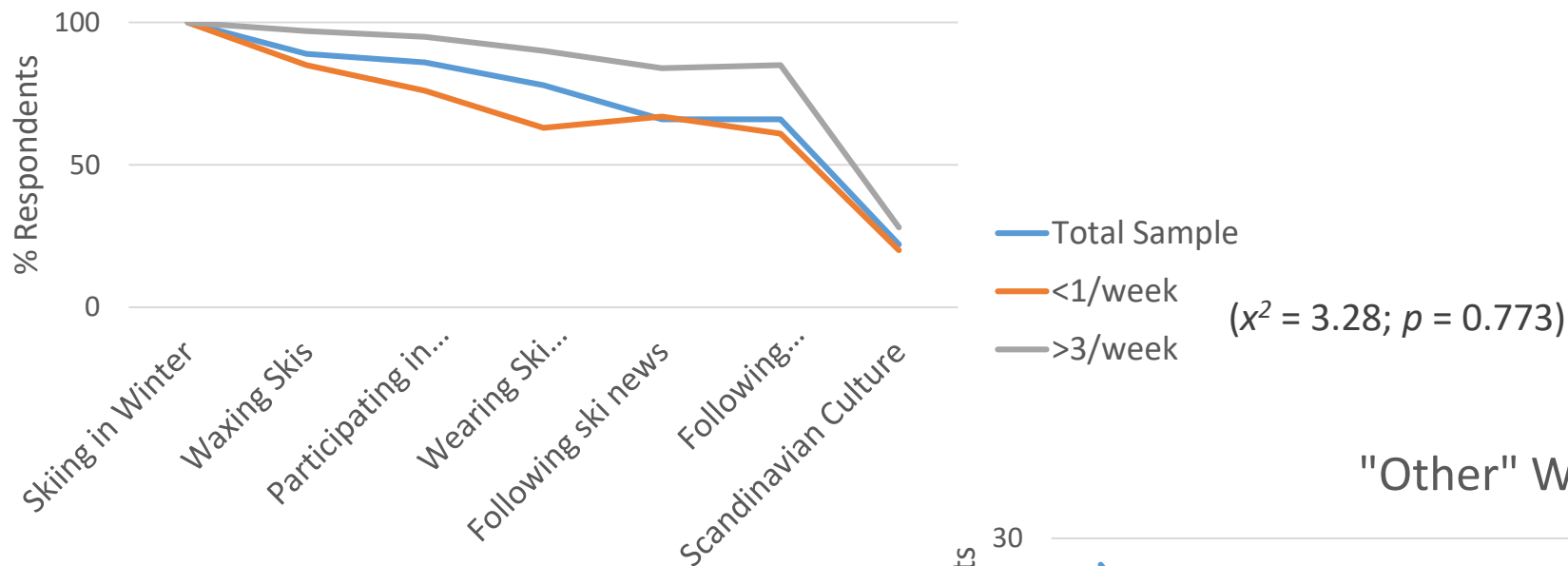




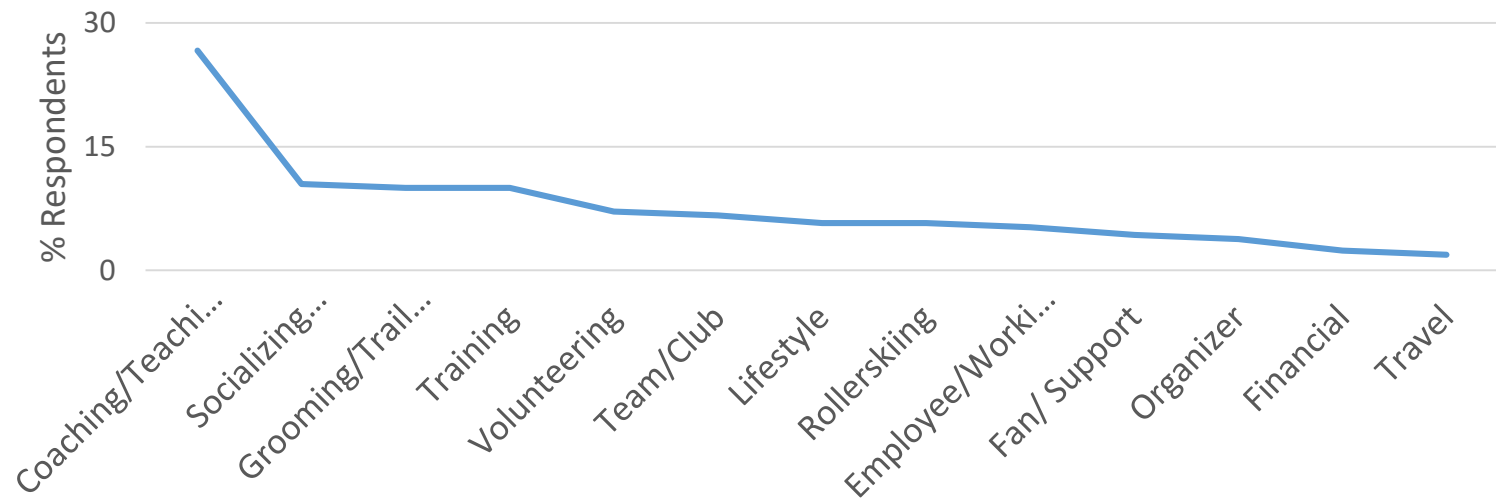


# Survey Results: Community & Culture

## Engagement in Cross Country Ski Culture



## "Other" Written Responses





# Theoretical Implications



**American Birkebeiner** @birkie · Apr 23, 2021

It all began in 1973, when 35 determined skiers gathered on the starting line for the American Birkebeiner. Little did they know... they were about to change everything. Registration opens May 1. Live the legacy - join us in 2022! [Birkie.com](https://www.birkie.com) #Birkie2022



**American Birkebeiner**

5,108 Tweets

Follow



**American Birkebeiner** @birkie · Feb 22, 2021

Dave (L), Jan (C) & Tim (R) started their virtual Birke this AM on the Sugarbush ski trails. Dave was one of Jan's skiers when he coached XC skiing at Cook County High School. This will be Jan's 42nd, Dave's 41st & Tim's 39th Birkie. That's 122 races between them! #VirtualBirkie





# Theoretical Implications

SKI ▾ RUN ▾ BIKE ▾ slumberland **BIRKIE** LIVE ▾ GIVE ▾ Mt. Telemark Village

It all began in 1973, when 35 determined skiers gathered on the starting line for the [American Birkebeiner](#). Little did they know...they were about to change everything. Today, the Birkie provides year-round, healthy, active lifestyle events for thousands of adventurous spirits of all ages and abilities.

**SKI . RUN . BIKE . LIVE!**



Snake River  
**CANOE RACE**

Mora **HALF  
MARATHON**

Mora Bike Vasaloppet Snake River Canoe Race  
Half Marathon Vasaloppet USA  
Mora Bike Snake River Canoe Race  
Snake River Canoe Race Half Marathon  
Snake River Canoe Race Vasaloppet USA

*Vasaloppet*

Mora  
**BIKE TOUR**

USA  
**VASALOPPET**



# Theoretical Implications



Adirondacks, New York, winter 2022-23  
(*Enjoy Winter's Ski Post*, vol. 29, Issue 36)



St Cloud, Minnesota, winter 2022-23



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