

Research article

## Does Age Matter? A Qualitative Comparison of Motives and Aspects of Risk in Adolescent and Adult Freeriders

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### Abstract

Recent research has shown multiple motives for high-risk sport participation derived from research on adult participants. The aim of this study was to provide insights into motives and risk-related aspects in adolescent high-risk sport participants and to compare those findings with adults performing the same activity. Semi-structured interviews were conducted with 24 adolescent (14-20 years) freeriders (skiers/snowboarders who ski outside the protected areas of a ski resort) and 24 adult freeriders (26-41 years). A content analysis was done using MAXQDA software. Both cohorts reported the motives Challenge (adolescents: 92%, adults: 88%), Freedom/Pleasure (adolescents: 88%, adults: 75%), Friends (adolescents: 88%, adults: 79%) and Balance (adolescents: 63%, adults: 63%). However, the description of friends differed between adults and adolescents. Whereas adolescents mostly referred to a community and shared interests, adults described the importance of trust and the development of deep friendships through the activity more often. Nature was a major motive in adults (83%) but not in adolescents (29%). Most of the adults have already experienced a major accident or close call ( $n = 19$ ; 79%), contrary to adolescents ( $n = 7$ ; 29%). Adolescents learned about the risks in freeriding primarily through their families ( $n = 10$ ) and the ski club ( $n = 9$ ). Some adults reported to have realized the risks involved in freeriding after starting with the activity due to experienced negative outcomes. Both cohorts were largely motivated by the same motives. As the new generation of freeriders seems to receive more instructions about risk reduction, it might be interesting to see if this educational approach results into less accidents or close calls in this group.

**Key words:** High-risk sports, extreme sports, psychological benefits, youth sports, skiing.

### Introduction

Globally 80 % of adolescents (aged 11-17 years) do not reach the minimum of physical activity per week (Hallal et al., 2012). Reasons to drop out of sports are specifically lack of time, lack of enjoyment and conflict of interests with varying reasons between boys and girls (Butcher et al., 2002; Slater and Tiggemann, 2010). Lack of time could be referred to the pressure of scheduled training sessions in sport clubs. However, sports like skateboarding, freestyle and freeride skiing, which are mostly self-organized, might not be affected by this reason. The interest in those activities is increasing (Erickson et al., 2013). Over 20 years ago, the American TV-Channel ESPN introduced the winter X-Games to present the most talented skiers, snowboarders and snowmobilers in freestyle competitions, including park skiing, superpipe and big air events (Erickson et al., 2013). Media consumption is growing with over 58 million

consumers mostly aged between 10 to 24 years (Bennett et al., 2003). The growing media attention and financial industry together with improved technologies could be contributing to a new shift in sport participation away from traditional sports towards more adventure based sports involving a certain amount of risk (Mei-Dan, 2018).

### Conceptualization of high-risk sports and freeriding

Adventure sports (Heggie and Caine, 2012; Kerr and Houge Mackenzie, 2012), action sports (Bennett et al., 2003), extreme sports (Pain and Pain, 2005; Brymer and Schweitzer, 2013a) and high-risk sports (Barlow et al., 2013; Woodman et al., 2010; Castanier et al., 2010) are often used interchangeably in the literature to refer to high-risk activities such as downhill mountain biking, paragliding or mountaineering. In the medical literature with its focus on injuries and the treatment of those, the term extreme sports is more commonly used (Feletti, 2017). However, one can also find sports with demanding 'extreme' physical affordance like ultramarathon running (Knechtle, 2017). Some first attempts tried to define the term extreme sports and differentiate it from other terms such as adventure sports (Cohen et al., 2018; Buckley, 2018; Immonen et al., 2017). In psychological approaches towards motivation and personality, extreme sports mostly refer to high-risk, high-skilled activities (Buckley, 2018). Immonen et al. (2017) defined extreme sports as 'emergent forms of action and adventure sports, consisting of an inimitable person-environment relationship with exquisite affordances for ultimate perception and movement experiences, leading to existential reflection and self-actualization as framed by the human form of life.'(p.2). This is also seen in freeriding, which describes skiing and snowboarding in undeveloped natural spaces (Reynier et al., 2014), jumping from sheer cliffs (Brymer and Schweitzer, 2013a), and involves the risk of serious personal injury or even death, through falls, avalanches or other natural hazards (Haegeli et al., 2012). Freeriding was reported to be a way of self-expression for participants involving unusual movement experiences when gliding through deep and untouched snow (Frühauf et al., 2017). In order to answer specific research questions within that field it might be clarifying to differentiate extreme sports which also include activities like ultramarathon running and to use the term high-risk sports for high-skilled sports "where you have to reckon with the possibility of serious injury or death as an inherent part of the activity" (Breivik, 1999; p.10).

Freeriding, along with other high-risk sports, is becoming increasingly popular (Pain and Pain, 2005) and is the fastest growing segment in the ski industry (Vargyas,

2016). As with other high-risk sports and due to the self-organization of the activity, total numbers of freeride participation are unobtainable and thus no mortality rates can be calculated (Brugger et al., 2013). Although in some high-risk sport activities prospective studies calculated injury propensity (Becker et al., 2013) this has not been done in freeriding yet. Whereas the total number of avalanche accidents seem stable (Procter et al., 2014), the number of avalanche fatalities through backcountry recreationists (e.g. freeriders, snowshoers, snowmobilers) is growing in some areas and the majority of victims are male (Jekich et al., 2016) what may be an artifact of higher numbers of male participants (Leiter and Rheinberger, 2016). In the winter of 2016/17, 136 avalanches involving humans were registered in Austria; 40 persons were injured, 25 died (Arbeitsgemeinschaft österreichischer Lawinenwarndienste, 2017).

Whereas risk-seeking people tend to be younger and male, an analysis on ski touring participants revealed that avalanche information for the day of departure could be more frequently reported by younger people (Procter et al., 2014), what might be discussed as prevalence of more precautionary behaviour in this group.

### Literature on high-risk sport participants

Research on high-risk sport participants has long been dominated by the single focus on sensation seeking and risk-taking as the only driver for participation (Clough et al., 2016; Brymer and Mackenzie, 2017). Participants were portrayed as adrenaline seekers, taking unnecessary pathological risks and being young and male (Clough et al., 2016). However, this does not account a) for the gender and age diversity in high-risk sports, b) the effort and skill participants have investigated in the sport, c) the variability in high-risk sports and d) the benefits experienced by the participants (Woodman et al., 2010; Barlow et al., 2013; Clough et al., 2016; Frühauf et al., 2017). Recent research has shown several potential psychological benefits for high-risk sport participants such as increased positive affect, resilience and self-efficacy as well as fulfillment of the three basic psychological needs of autonomy, competence and relatedness (Clough et al., 2016). Further benefits were named as challenging oneself, experiencing intense emotions, having a counterbalance to everyday life and a connection with nature (Clough et al., 2016; Frühauf et al., 2017; Brymer and Gray, 2010). Additionally, high-risk sport participation can increase physical activity, which has positive psychological and physiological benefits (Clough et al., 2016) and is underrepresented in adults and adolescents. Of the 13-15 year-olds, 80.3 % do not meet the recommendations of health enhancing physical activity with girls being less active than boys (Hallal et al., 2012). The age of adolescence represents an enhanced reward sensitivity which is often linked to increased risk-taking behaviours in both animals and humans (Galván, 2013). Most research on adolescent risk-taking has been directed towards negative risks such as drug use and reckless-driving.

However, the approach behaviour and novelty seeking which is influenced by reward sensitivity seems to be

necessary for adolescents to gain independence (Galván, 2013) and risks may also be positive in a socially acceptable and constructive way (Duell and Steinberg, 2019). High-risk sports might be an opportunity for positive risk-taking in adolescents (e.g. snowboard freestyle as mentioned as an example in Duell and Steinberg (2019)). Risk-taking (both positive and negative) is seen as a way to earn prestige in adolescents and was seen as a reinforcing behaviour (Dahl et al., 2018). This is in line with recent research showing a heightened risk-taking behaviour and risk-perception when surrounded by peers (Silva et al., 2016). However, adolescents also learned faster from both positive and negative outcomes and had a better task performance when being observed by peers than tested alone (Silva et al., 2016). Since skitouring is usually performed in groups (91.6% in groups of two or more) (Procter et al., 2014) and friends were reported as a crucial motive for participation in freeriding (Frühauf et al., 2017), these sports might be an interesting target to study risk-taking and peer influence in adolescents.

As a major part of the population consuming high-risk sports are adolescents (Bennett et al., 2003), studying behaviour patterns of this group seems to be of interest. Despite first studies and reviews about injuries in adventure and extreme sports in adolescents were published (Emery, 2018; Heggie and Caine, 2012; Heggie and Küpper, 2018), to the best of the authors' knowledge, no studies on psychological consequences of adolescent high-risk sport participation are available.

Although there are some questionnaires available which investigate psychological constructs behind sensation seeking (Barlow et al., 2013; Frühauf et al., 2018b; Frühauf et al., 2019; Castanier et al., 2010; Woodman et al., 2013), this approach was considered too narrow to enter a research field which is widely unexplored. Thus the following study used a qualitative investigation to assess motives and aspects of risks in adolescent and adult high-risk sport participants. In a recent qualitative analysis on adult freeriders, no age differences in motives or aspects of risk were seen in participants between 18 and 25 years or older than 25 years (Frühauf et al., 2017). The ages between 18-25 years are also known as emerging adulthood which are characterized by an instability and unpredictability on demographic norms and roles (Arnett, 2000). Further they don't see themselves as adults nor as adolescents which reflects the instability of this age group. Arnett (2000) calls this time the roleless role where most of the demographic changes take place (e.g. home, work, family). However, as it may be that there are individual differences regarding durations of adolescence, a cut off at 25 might have diminished potential age differences. Thus, the aim of the present study was to gain a first insight into motives and risk-related aspects in adolescent freeriders aged  $\leq 20$  years and to perform a comparison with adult freeriders  $\geq 26$  years.

## Methods

### Participants

In total 48 freeride athletes were interviewed; 24 adoles-

cents (14-20 years, 3 females) and 24 adults (26 to 41 years, 6 females). Since most authors of previous qualitative work in the research field of high-risk/extreme sports only included 4-16 participants depending on the heterogeneity of participants (Jones et al., 2015; Brymer and Schweitzer, 2013a; Willig, 2008), the number of 48 participants was considered a high number, especially for a homogenous group of participants from one activity. The interviews of the adult population were part of a previous study (Frühauf et al., 2017). Sawyer et al. (2018) suggested an age extension of the adolescence age up to 24 years in their review since this is more accurate to life changes and the aging population within the last century. In order to have a larger age gap between the adolescent and adult population, adolescents were interviewed up to 20 years and adults were included beginning of 26 years and older. Participants were selected using a combination of purposive sampling strategies, namely criterion-based, maximum variation sampling (Patton, 1990) and snowball recruitment (Hennink et al., 2011). This approach ensured that participants had specific knowledge and experience of the phenomena of interest whilst allowing the analysis of age effects (Sparkes and Smith, 2014). The primary criterion was that athletes participated in freeride contests or in freeride movie productions. Adolescents' athletes were participating or have been participating in the Junior Freeride Qualifier Tour (14-18 years); adults were participating in the Freeride World Qualifier Tour or the Freeride World Tour. Those criteria were set to ensure experience and knowledge in the target group. Participants were informed about the study procedure prior to the interviews verbally and they received an information sheet according to the ethical guidelines of Helsinki which was signed at the beginning of the interviews. In underage participants, parents signed a separate information sheet where they gave their permission for their child to participate in the study. Approval by the Board for Ethical Questions in Science of the University of Innsbruck in accordance with the Declaration of Helsinki, was given prior to the study (No.47/2016, Date 21.12.2016 and No. 47/2017, Date 27.11.2017).

### Procedure

A semi-structured interview was carried out with each participant. An interview guide was used to ensure that each participant was asked the same questions but at the same time allow them to talk freely about their experiences. The same interview guide as in the study by Frühauf et al. (2017) was used. The interview guide was developed by the research team based on existing research on high-risk sport participants. Interviews were carried out by four different interviewers. The average interview duration for adults was between 30 and 40 minutes and for adolescents between 20 and 30 minutes. All but two interviews were conducted in German; the other two were conducted in English as the participants felt more comfortable speaking English than German. All interviews were carried out one-to-one.

### Analysis

When analyzing and interpreting qualitative data, the underlying philosophical orientation of the authors might be

of interest. The philosophical orientation of the present research group could be explained best as an interplay of relativist ontology and critical rationalism. The authors acknowledge that the description of an external reality is not possible beyond individual reflections and interpretations (Levers, 2013).

Before analyzing the data, all interviews were transcribed verbatim; transcription was carried out immediately after the interview. Interesting phrases were highlighted and any non-verbal communications were noted. The data was then analyzed independently in several distinct stages using MAXQDA Software (MAXQDA, 1989-2017). Firstly, the first author read the transcripts a number of times to immerse themselves in the data, whereas group allocation of participants was known. Secondly, an inductive hierarchical content analysis was carried out where raw data themes were given codes (e.g., "being in the moment"). Codes from the analysis of the article Frühauf et al. (2017) were used firstly resulting in an abductive approach. When there was not a suitable existing code a new one was created. Whilst the analysis was conducted in both English and German, all codes and themes were named in English language to reduce translation bias. This procedure was repeated for all 48 interviews. In the next step of analysis, all interviews were cross-checked, ensuring that coding was consistent and accurately represented the data. Following this, similar codes were grouped into main categories (e.g., being in the moment and experiencing emotions were grouped into the theme balance). The final step was to confirm the codes and main categories with the third author, who acted as a critical friend (Smith and Sparkes, 2009). Although the critical friend did not analyse the full sample, in terms of disagreement or uncertainty by the primary analyst, codes and main themes were discussed until full agreement was reached. Mixed method analyses were used to assess age differences (adolescents  $\leq 20$  years; adults  $\geq 26$  years). Further, those age differences in motives were tested for using  $\chi^2$  tests (alpha = 0.05) in SPSS 23.0 (2015). In addition to this, raw quotes have been presented in English, with the hope that the data will speak for itself and the voices of the participants might be heard. The participants are indicated by numbers, allocation to Junior (J;  $\leq 20$  years) or Adult (A;  $\geq 26$  years), gender (m, male; f, female) and age (e.g. 17yrs).

### Results

Both cohorts reported the motives *Challenge*, *Freedom/Pleasure*, *Friends* and *Balance* (Table 1). *Nature* was named as a major motive in adults but not in adolescents (Table 1). No significant group differences were seen in the motives *Challenge*, *Freedom/Pleasure*, *Friends* and *Balance*. *Nature* differed significantly between the groups.

**Table 1. Motives in adolescent and adult freeriders.**

Motives	Adolescents	Adults	Chi <sup>2</sup>
	n (%)	n (%)	Significance (p)
Challenge	22 (92)	21 (88)	.637
Freedom/Pleasure	21 (88)	18 (75)	.439
Friends	21 (88)	19 (79)	.155
Balance	15 (63)	16 (67)	.540
Nature	7 (29)	20 (83)	<.001

## Challenge

The motive Challenge comprised, besides the description of challenge (e.g. how the conditions are always different and this is a new challenge everyday), explanations about the adventurous part of the activity, the aim of getting to know one's limits and a feeling of mastery and skill in the activity. A differentiation in the description of challenge was not seen between the cohorts.

### *Adolescents (92 %):*

„[...] freeriding has so much variety, it is always different. In skiing, even when you're in a big ski resort and you go on different slopes, it is always the same. The base is always similar. There is no obstacle, everything is plain. But this is not interesting; I like the challenge and the obstacles in freeriding.” (05Jm, 20yrs male)

“It's always different, it's never the same. The snow is always different, the conditions and the environment” (04Jm, 14yrs)

“I just like to ski in the powder, to be in the backcountry and to jump off cliffs. It's just more exciting than normal skiing.” (21Jm, 15 yrs )

### *Adults (88%):*

“It's the challenge, we are looking for something which is a problem to be solved and then we have to solve it.” (14Am, 26yrs)

“The thing is to work on your personal skills, improving your skiing and going to the limits of what is still possible.” (21Am, 34 yrs)

“I like the interaction of the snowboard with the element. You have to react fast. That's why I've never become a park rider. There the surprise moment is missing. Ok you might have the surprise if it works out or not but you don't have the surprise moment if there's suddenly an ice plate instead of powder. Park and slope skiing, the environment is much more regulated.” (03Af, 28 yrs)

## Freedom/Pleasure

Freedom/Pleasure described the autonomy in freeriding, the never-ending possibilities of the activity, the creativity and the pure pleasure and ease of skiing. The description of freedom/pleasure was seen similarly in both cohorts. A lot of participants have quit skiracing and started with freeriding partly due to the more autonomous aspect in freeriding. 67% of adolescents and 80% of adults reported to have quit skiracing and changed to freeriding.

### *Adolescents (88%):*

“There are no rules; you can do whatever you like. In skiracing you have to go through the poles, there are so many rules... In freeriding you have a whole mountain where you can go down, and you can decide where to go, and you don't have to stick to any regulations.” (17Jm, 17 yrs)

“That you can do whatever you like, if you want to drop [that cliff] than you drop it, if not, you don't.” (12Jm, 19 yrs)

“You can decide on your own where you want to ski. This is even already implemented in the name 'Free-riding'. It's just better [than skiracing] because you are so much freer.” (04Jm, 14 yrs)

### *Adults (75%):*

“In the mountains, you can decide what to do; you decide the pace, whether it's going to be high, fast, steep, mellow. You decide.” (13Af, 28 yrs)

“Maybe I would've gotten more into soccer, but I'm not the type of person to subordinate myself in a team, this clear hierarchy with the trainer[...]. In freeriding you're free” (14Am, 26yrs)

## Friends

The description of friends differed between adults and adolescents. Whereas adolescents referred rather to a community and shared interests, adults described the importance of trust and the development of deep friendships through the activity. This shared trust was only mentioned by two adolescents.

### *Adolescents (88%):*

“Without all the people I wouldn't do that sport or at least I wouldn't have as much fun in this sport. It's always amazing how we push each other and motivate each other, like saying 'wow that cliff drop was great.'” (01Jm, 15 yrs)

“I only like to go skiing in the backcountry with people who I know I can trust, those who know how to react in emergency situations.” (22Jm, 16 yrs)

“The people are great - going freeriding with friends, you try to push each other.” (03Jf, 16 yrs)

### *Adults (79%):*

“The most important thing are the people I go skiing with. You don't just go skiing for yourself. [...] you have your friends who you trust because you are exposed to a certain risk and you have to know each other and trust each other in order to get further.” (21Am, 34 yrs)

“It forms long friendships which deepen through it and are filled with memories.” (03Am, 30 yrs)

“Who I go skiing with plays an important role. Because when I do exciting runs I need the right partner to do it, I can't do that with just anyone. They have to be like-minded people and people who I get along with really well. [...] Those friendships grow more intense through that experience and are more valuable than those you'll make when drinking coffee for example. They are likeminded people who go on an adventure with me and they are really close friends.” (25Am, 41 yrs)

## Balance

Balance described the compensation to everyday life which resulted in a more relaxed and calmed state as well as the complete focus on the activity (e.g. being in the moment), which let the participants forget everyday problems.

**Adolescents (63%):**

"It just makes me happy. When I've been skiing a lot at the weekend I'll start with a greater ambition in the new week. And it effects my work motivation positively if I'm still motivated from the weekend before." (13Jm, 19 yrs)

"I definitely need this athletic balance to everyday life. This is freeriding in the winter and downhillbiking in the summer. Because when you are freeriding you can't think about 'uh I still have to do that for school' you have to be completely there where you are at the moment." (18Jm, 16 yrs)

"I definitely need skiing. If I can't go when the conditions are great it gets on my nerves. Also if I only have to learn and can't go skiing that's really stupid. When I go at least a little bit skiing after school, than it's great. I've done something and I can learn better when I'm back at home afterwards." (03Jf, 16 yrs)

**Adults (67%):**

"Skiing calms you down, you can reset, you are in the moment without thinking ahead or in the past. Especially in our society where everyone is stressed." (13Af, 28 yrs)

"Freeriding is such a complex sport. You don't have time to think about anything else. You're not allowed to make any faults. That's why you are forced to be focused and concentrated and completely in the moment." (03Af, 28 yrs)

"A good time at the mountain and you're completely resetted afterwards." (03Am, 30 yrs)

**Nature**

Descriptions of nature ranged from the appreciation of the beauty of nature to the tranquility and untouched nature. Those descriptions were mainly found in adults and in those few adolescents who have mentioned nature as an important aspect of their activity.

**Adolescents (29%):**

"The tranquility out there is pretty good to reset. You're away from the stress and it's just great to look at the landscape, I like that a lot." (18Jm, 16 yrs)

"[...] it is just beautiful, especially when the snow is untouched, no other people no lifts, that's great." (04Jm, 14 years)

**Adults (83 %):**

"For me personally it's the uniqueness of nature, it has always attracted me. Being able to ski this is a primary attraction." (19Am, 38 yrs)

"[...] and the nature. I love being outdoors. If you do a split board tour in the untouched nature, there is so much tranquility out there." (04Am, 31 yrs)

All participants including adolescents reported to know about the risks involved in freeriding. They all reported to know about risk-management strategies, which include for example the avalanche danger information and the standard rescue equipment (e.g. beacon, shovel, probe). Most of the adults have already experienced a major accident or close call (n=19; 79%), contrary to adolescents (n=7; 29%) (Table 2). "Close

calls" are defined as incidents that come very close to resulting in a negative outcome (Woodman et al., 2010).

**Table 2. Aspects of risk in adolescent and adult freeriders.**

Aspects of risk	Adolescents n (%)	Adults n (%)	Chi <sup>2</sup> Significance (p)
Reported experienced major accident/close call	7 (29)	19 (79)	.001
Educated risk-awareness with the start of the activity	19 (79)	9 (38)	.008
Reported change of risk-taking behaviour	4 (17)	22 (92)	<.001

To have experienced a major accident or close call was reported to have changed the risk-taking behaviour in both cohorts. Further, four of the adults reported to have already witnessed fatalities or have lost (a) close friends within their activity which was followed by a change in behaviour. A differentiation in the description of risk-taking in freeriding was seen depending on the possible negative outcome. Jumping from rocks and doing tricks in a relatively avalanche safe environment was associated with higher risk-taking because a negative outcome would be more likely to result in injuries than in death. Slope assessment in terms of avalanche safety, where a negative outcome could be death, was associated with low risk-taking. Adults differentiated their description about risk-taking depending on the persons they were referring to.

"You have to differentiate what is careful for my mother or for a freerider. I am a pretty careful freerider, but my mother would say I'm kind of crazy." (05Af, 27 yrs)

"If you show what we are doing to a person who's not involved in freeriding first thing is - crazy people taking such high risks. But I would say my risk-taking level is really low. The conditions and the day have to be right for what I want to ski. I don't ski everything, every day, in every conditions." (08Am, 33 yrs)

**Risk-awareness**

Adolescents learned about the risks and risk-management behaviour in freeriding primarily through their families (n = 10) and the ski club (n=9). Some adults learned about the risks while being educated as a ski instructor (n = 7) but mainly reported to have realized the risk in freeriding mostly after starting with the activity ("Ten years ago a friend of me died just next to the slope in an avalanche [...] That was a wakening call; I realized you don't just ride next to the slope without safety equipment and experience." (06Af, 30yrs). A difference between the cohorts was seen in participants' description about risk-awareness. Whereas adults stated that the risk in freeriding can never be completely eliminated and only reduced (e.g. "You can never completely eliminate the risk, something can always happen, something is always possible, so that's why people think we are crazy." 20Am, 31 yrs), this awareness was usually not reported by adolescents. As one adolescent stated "You just have to look at the avalanche forecast on

the day before. You don't even need a lot of experience; anyone can have a look there and there's written everything which you need to know."

### Risk-assessment

The description about risk-assessment was more detailed in adults than in adolescents:

"My [risk] assessment is based on my experience and on the information that I have. If I am in the backcountry, the steeper it gets the more components I have to consider and the more components have to turn green to be able to do it. . . [..]It is a rational thing. I always try to minimize it to an acceptable risk, but where this acceptable risk is, is my decision. You depend on your knowledge, your experience and your instinct." (03Am, 30 yrs)

Whereas some adolescents seem to be overstrained with the risks involved ("I don't think too much about it [the danger of the activity], the more you think about it the more it scares you." 04Jm, 14 yrs), other adolescents talked about a very precise planning and evaluation: "You look at a lot of things from friends. If you know you feel safe in the group than everything will be checked, avalanche report, wind etc. in order to sit together at the end of the day without any injuries and nothing dramatically has happened. With the group I go riding most of the times, the people are really ambitious that everything is safe. If anyone has doubts than we won't ride the face we were looking at. Rather not riding one face instead of risking a lot" (12Jm, 19 yrs).

However, most adolescents stay within the skiing resort and do not have to plan the freeriding on their own because they are part of the freeride team of their ski club ("We are 9 in total between 13 and 15 years and one who is 19 years. [..] In the winter we go skiing a lot, we also do technique, but we ride a lot." 01Jm, 15yrs). Other Adolescents get some advice where it is better to ride in which conditions ("I think the most difficult part is if you can ride a face or not. That's why I care about the avalanche forecast and that stuff. And my father is often in the backcountry. When I go out of the house in the morning he tells me where I should watch out." 08Jm, 18yrs).

### Discussion

The present study sought to identify the motives and aspects of risk for adolescent participation in a single high-risk sport, namely freeriding, and to compare those motives with adults of the same sport. This analysis revealed that adolescent freeriders are mainly motivated by the same motives as adult freeriders. Whereas adolescent freeriders were mostly educated about the risks in freeriding by their family or the ski club, reports from adults indicated a higher rate of realization about the risks through negative outcomes. Although all participants imply risk-management strategies, adolescents mainly believed in an elimination of risk whereas adults spoke about a reduction of risk.

Motives reported by both cohorts were described as challenging oneself, experiencing the freedom of the activity, having friends within the activity and having a counterbalance to everyday life. Whereas adults acknowledged

nature as a motive for participation in freeriding, the majority of adolescents did not mention nature as an aspect of freeriding. Numerous theories have recognized the benefits of natural environments (Shanahan et al., 2016; Clough et al., 2016). Thus, also not consciously mentioned by the majority of the adolescents, nature might influence the experience of freeriding nevertheless. A further differentiation was seen in the motive *Friends*. Whereas adults mostly referred to the importance of trust and the necessity of trusted partners within the activity, adolescents rather referred to the community of like-minded people who share the passion for the sport. Only two adolescents have reported the importance of trusted friends in freeriding.

The current analyses revealed *Challenge*, *Balance* and *Freedom* as major motives of participation. Those motives could be interpreted as a satisfaction for the three psychological needs of competence ( $\hat{=}$  *Challenge*), relatedness ( $\hat{=}$  *Friends*) and autonomy ( $\hat{=}$  *Freedom*). Satisfaction of the three basic psychological needs of competence, relatedness and autonomy was seen as potential benefits for high-risk sport participation (Clough et al., 2016) and seems to be related to drop out in sports, since lower relatedness and autonomy was found in sport drop outs (Calvo et al., 2010). The data of the current study revealed that many adolescent and adult freeriders quit ski racing and changed to freeriding. Freeriding involves own decision making and as such satisfying the need for autonomy and supporting the development of competence. In the current study this motive was named as freedom in the activity. One reason to quit ski racing, was lack of enjoyment. Further reasons were reported as strict regulations and rules and high amount of training times. Lack of enjoyment was reported as the most important reason for sport withdrawal in competitive youth sports (Butcher et al., 2002).

It is important to implement health-enhancing intervention strategies in the adolescent age (Dahl et al., 2018; Youngblade et al., 2007). Many intervention strategies which are summed up in the paper by Dahl et al. (2018) are addressed within the sport of freeriding. This includes the possibility to create opportunities for positive risk-taking and the support of social relationships. Positive risk-taking should include the following three elements: 'benefit adolescents' well-being; carry potential costs that are mild in severity, being legal and socially acceptable (Duell and Steinberg, 2019). Although the risk in freeriding is potentially high, absolute fatalities in all Austrian summer and winter mountainsport activities from adolescents aged 11-20 years were 199 (1997-2012) and for those older than 21 years 4112, concluding a relative mortality of 5% (Österreichisches Kuratorium für Alpine Sicherheit, 1997-2012). Freeriding is a context-dependent risk-taking behaviour where the boundary between acceptable and unacceptable risk is not linear (Haegeli et al., 2012). Thus, especially for adolescents decision making and risk-management interventions need to be implemented. Those intervention strategies also need to take the influence of peers and the social environment into account (Youngblade et al., 2007; Crosnoe and McNeely, 2008). Social relationships were named as a major motive for participation in freeriding by adolescents in the present study. Considering the influence of

peers on adolescents risk-taking (Crosnoe and McNeely, 2008), the social environment might be a critical intervention target in order to influence risk-behaviour positively in adolescents. Adolescent freeriders talked about the influence of friends on their performance and willingness to expand their performance. Furthermore, two adolescents also mentioned the danger of group influence on decision making in the backcountry. A further intervention strategy by Dahl et al. (2018) suggests a way 'that honours adolescents' sensitivity to autonomy, respect and prestige'. Especially for girls, freeriding might provide an opportunity where they can earn prestige. Particularly in the early phase of adolescence where social role and stereotypes are not yet fully adapted, participation in rather male categorized sports, might provide an opportunity for girls to discover that they can earn prestige (Dahl et al., 2018). Although female freeriders are fewer in numbers, participation in the activity is not gendered. Contrary to traditional sports where participation is separated between the genders, high-risk sports provide the opportunity for girls not to be separated (Thorpe, 2005). The number of female freeriders in this study is low but seems to represent the fewer numbers of female freeriders.

Despite all benefits, freeriding is a high-risk sport and freeriders experience more accidents and close calls compared to slope skiers (Frühauf et al., 2018a). However, personal knowledge and technical skills may allow participants to manage their risk exposure within reason (Haegeli and Pröbstl-Haider, 2016). Standard rescue equipment which is mandatory in freeride competitions (beacon, shovel, probe, backpack, back protector, helmet) might teach young participants about a sensible handling with risks. Protective gear especially helmets were shown to reduce the risk of head injuries (Emery et al., 2017; Hagel et al., 2005). Analysis in mountain bike parks have shown, that helmet adherence is especially high in young participants and has been shown to be protective of traumatic brain injury in skateboarding specifically (Emery, 2018). In a cross-sectional study on ski-tourers and snowshoers on adherence to safety practices, age ( $\leq 35$  years) was a significant predictor for the prevalence of standard rescue equipment and the report of the actual avalanche danger level (Procter et al., 2014). It seems that young high-risk sport participants are aware of the risks and the protective gear, which can reduce risk. This was also reported by participants in the present study. All participants reported to ride with the standard rescue equipment and reported to know about the avalanche forecast when freeriding. Only 29% of the adolescents reported to have experienced an own or external accident or close call. This is contrary to adults in which the majority (79%) experienced such an incident. Although experience within the sport was not controlled for, it seems likely to link this finding to the own realization of risk in adult freeriders compared to a primarily educated approach by adolescent freeriders. Furthermore, adults reported to have changed their behaviour towards more safety adherence following an own or external accident or close call. Maybe the experience of the sport and the experience of negative incidents have led to a critical acknowledgement in adults that a negative outcome is always possible within freeriding. This critical acknowledgment of risk was not seen in adolescents in the present study.

A possible interpretation could be the assumed higher safety adherence right from the beginning of the activity. Contrary to adults which have reported to have learned about the risks involved in freeriding while already performing the activity. This has sometimes resulted in negative outcomes which have changed the reported risk-taking behaviour of participants. Maybe adolescents do not need those negative outcomes for a higher safety adherence. Nevertheless, the experience in the activity was not quantified in the present study. With a higher activity exposure the probability of being involved in an accident might grow. Experience as well as accidents/close calls were reported to have influenced the risk-taking behaviour of adult freeriders (Frühauf et al., 2017). However, the risks which are involved in those high-risk sports "and the way youth handle those risks help to develop their character and confidence and is one of the main reasons they are attracted to them." (Mei-Dan, 2018; p.2).

### Strengths and limitations

The most important strengths of this study are that it 1) investigated adolescent high-risk sport participants which is a barely unexplored research area, 2) examined a single high-risk sport and 3) had a much higher sample size than many previous qualitative studies in high-risk sports (Willing, 2008; Kerr and Houge Mackenzie, 2012; Jones et al., 2015; Brymer and Schweitzer, 2013b). A qualitative approach was used for this study since qualitative research is often used to examine issues in great detail and depth (Anderson, 2010). However, readers should avoid generalizing the results of this study beyond highly experienced freeriders as it has been shown that people have different motives for participating in different high-risk sports (Barlow et al., 2013). The female to male ratio was different between the cohorts. In adolescents only three female freeriders were interviewed and in adults seven. Although the time of adolescence is ending with approximately 24 years (Sawyer et al., 2018), we only included adolescents up to 20 years and adults from the beginning of 26 years.

### Conclusion

The main motives to participate in freeriding were similar between adolescent and adult freeriders, namely challenging oneself, experiencing the freedom of the activity, having friends within the activity and having a counterbalance to everyday life. A differentiation in the description of the motive *Friends* was seen between the cohorts with a higher focus on the 'community' as a group with shared interests in adolescents than as trusting partners as it was seen in adults. The experience of nature was only seen as a motive for adults and not for adolescents. Freeriding, as a high-risk sport, might target important behavioural goals in adolescents which could help them to develop positive attitudes (e.g. social behaviour and self-esteem). As Dahl et al (2018) explained, the value of risk-taking opportunities in adolescents shifted and it is now seen how those activities and experiences may promote healthy trajectories and identity development and might prevent antisocial and self-injurious paths. As the new generation of freeriders seems to receive more instructions about risk reduction it might be interesting to see if this educational approach results

into less accidents or close calls in this group.

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### Key points

- First comparison on motives between adolescent and adult high-risk sport participants.
- Adolescent and adult freeriders are mainly motivated by the same motives.
- Freeriding might target important behavioural goals in adolescents which could help them to develop positive attitudes.
- Adolescents have reported less accidents/close calls than adults (29% vs 75%).

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