Towards New Heights: An Interview Study on Psychological Characteristics in Danish Elite Climbing

Nikita Beiskjær*, Andreas Küttel*
Corresponding Author: Andreas Küttel, akuttel@health.sdu.dk
*Faculty of Health Sciences, University of Southern Denmark

Abstract: Psychological characteristics, alongside environment characteristics, have an important influence on the developmental process of turning young talent into successful elite athletes. The purpose of this study was to explore the psychological characteristics and skills of elite Danish senior climbers that are important for achieving success in a niche sport in a small country such as Denmark. Additionally, the environmental factors (e.g. relations and facilities) which influence the development of these psychological characteristics in climbers were examined. Data collection included four semi-structured interviews with elite senior climbers. The empirical material was analyzed with an explorative approach following the six stages of thematic analysis, and later discussed against former research on psychological and environmental factors. The study identified five factors that the athletes used or possessed during their career to achieve success: (a) focus on progress, (b) self-reflexivity and regulation, (c) coping and resilience, (d) adaptability, and (e) autonomy. In addition, the athletes emphasized opportunities and barriers in their environment which either facilitated or limited their psychological and personal development. Opportunities included the community and relations as well as the learning culture. Barriers were a shortage of (sport-specific) challenges and a general reluctance to change. The findings indicate that adaptability and autonomy are domain-specific psychological characteristics for climbing in a Danish context, supporting earlier findings that psychological factors are domain and context-specific. Practical suggestions are discussed on how to facilitate athletes in a sport having limited structural support and a lack of competition within the country.

Keywords: Elite climbing; psychological skills; niche sport; talent development environment; sport system

Introduction

Climbing has attracted and fascinated humans long before it was recognized as a sport. It was not before 1985 until the first official climbing competition was held in Italy, and the first climbing world championships took place in 1991 (Sanchez et al. 2019). This was the start of the international development of climbing as a sport, resulting in it becoming an Olympic discipline with its first appearance at the Tokyo 2020 Games, consisting of speed climbing, bouldering, and lead. The sport requires strength, flexibility, and careful advance planning: the first-ever medalists will all possess this unique combination of physical and mental capability and decisiveness.

The ‘sportification’ of climbing has led to a more systematic approach to training methods such as physiological aspects of climbing (Giles, Rhodes and Taunton 2006; Hrušová and Chaloupská 2019; Sheel 2004; Watts 2004), motivation and personality (Sanchez et al. 2019) and general performance determinants (Saul et al. 2019). Some researchers claim that
the psychological factors might contribute to an even larger degree to the performance in climbing compared to other sports due to its high-risk profile and dealing with fear and anxiety (Giles et al. 2006; Sanchez et al. 2019). Therefore, it is worth investigating further how these psychological skills are developed in climbers and how they affect their career development.

Even though Denmark is a relatively small and geographically flat country without a long tradition of (alpine) climbing, lately there has been an increase in members in Danish climbing clubs, from 8,146 (2018) to 10,092 (2019). However, compared to other sports such as handball or football (approximately 330,000 members in 2019), the numbers of members, and thereby also funding in organised climbing, are remarkably lower. Given the increased interest in climbing in Denmark, the Danish Climbing Association has intensified its resources in the talent development department, resulting in a newly established talent development strategy (Danish Climbing Association 2021), which includes the establishment of a new senior national team currently consisting of six climbers. In general, sport in Denmark is based on voluntarism where early mass sport participation and a sport-for-all concept serve as the foundations for elite sports development (Kuettel et al. 2020). However, for climbing and bouldering, there is a growth of privately owned commercial gyms that attract the very best climbers who do not find sufficient challenges and good enough facilities in regular voluntary-based clubs (Ugeavisen 2019). Naturally, the commercial gyms have the means to pay their employees and attract the best trainers and route setters enabling those gyms to facilitate a higher quality of practice for the Danish climbers.

Given that it is very difficult to achieve international sporting success on the individual- and the country-level (and even more so for small countries such as Denmark or Malta), the question arises if it is possible to establish a high-performance set-up in a niche sport that is organised in small clubs with only a few international athletes. Another question is what factors Danish climbers highlight as being important to achieving the desired international level despite these structural constraints and limited resources.

**Literature Review**

According to the framework of SPLISS [Sport Policy Factors Leading to International Sporting Success] (De Bosscher et al. 2015), certain key factors (pillars) need to be present for a country to be part of the international medal race. Besides financial support and organisation/structure of sport policies, participation (talent pool), talent identification and development systems, athlete career support, training facilities, and coaching provision have been highlighted to be important factors that improve the chances for international sporting success. Research investigating successful talent environments in Scandinavia (Henriksen and Stambulova 2017) has shown that these environments share some characteristics (e.g. sharing knowledge, focus on development rather than early results, autonomy development, and coordinated efforts between sport and school) despite often lacking proper financial resources or top-notch facilities.

Besides environmental characteristics, certain individual psychological factors have been identified in successful high-performance athletes (Gould, Diffenbach, and Moffets 2002; MacNamara 2011). In a recent systematic review, Dohme and colleagues (2019) identified a total of 19 different categories of psychological skills and characteristics (e.g. goal setting, autonomy, visualization, dealing with distractions, motivation, self-regulation). However, even though researchers agree on the importance of these psychological skills, there is an ongoing debate about *which*, *how many*, and *when* they are important within an athletic career, highlighting the sport-specific and interpersonal diversity (Elbe and Wikman 2017).
Towards New Heights: An Interview Study on Psychological Characteristics in Danish Elite Climbing

Psychological Characteristics in Elite Sport

It is well-established in the field of talent development that psychological characteristics and skills are important not only for elite athletes but also for the general athletic development of athletes (MacNamara 2011; Martindale and Mortimer 2011). Multiple studies have investigated what characterizes athletes who achieve great success. Amongst these are Elbe and Wikman (2017) who stated that having a high degree of motivation and self-regulating skills may be the most crucial ones for an athlete's successful development, along with social skills. These skills are also emphasized by MacNamara, Button, and Collins (2010) as well as Gould et al. (2002), who moreover mention confidence, the ability to stay focused, and visualization as important features of an upcoming or elite athlete.

A theoretical framework called Psychological Characteristics of Developing Excellence (PCDE) has been developed by MacNamara and colleagues (2010a; 2010b) through a grounded theory approach using content analysis based on in-depth interviews with elite athletes as well as their parents and coaches. Based on these analyses, nine PCDEs have been identified that cover both skills and characteristics including (1) commitment, (2) focus and distraction control, (3) imagery, (4) realistic performance evaluation, (5) quality practice, (6) goal setting, (7) coping with pressure, (8) planning and organisational skills, and lastly (9) self-awareness (MacNamara 2011). This framework was developed based on data from athletes in domains such as track/field and team sports but not in niche sports like climbing. The PCDEs that MacNamara and her colleagues discovered as being important could still be relevant for sports not included in the interview study, but some could be more sport specific. Therefore, it becomes evident to identify which characteristics are of additional importance for optimal development in a sport such as climbing. Furthermore, it is also relevant to consider that the importance of certain PCDEs may vary across the different stages of an athlete's career, for example a higher level of autonomy in the later stages (MacNamara et al. 2010b).

MacNamara (2011) highlighted that PCDEs play an important role in the talented athlete's ability to seize the opportunities that present themselves throughout their careers thereby making them develop optimally. Therefore, it is crucial to start as early as possible to deliberately foster these psychological skills and to make sure that the complexity of the skills trained increases naturally with the athlete's age and maturity (Dohme et al. 2019). Additionally, well-developed PCDEs are a great asset in the crucial moments of performance, which also applies to climbing where skills such as keeping focus and coping with pressure are highly demanded.

Importance of the Environment for Developing Psychological Characteristics

MacNamara and Collins (2013) argued that talent development systems and programmes should focus on offering athletes the most optimal learning environment so they can fulfill their potential. This is in line with Li, Martindale, and Sun (2019) who pointed out that the talent development environment plays a critical role in the athlete's positive development. Applying a holistic and ecological view on talent development, Henriksen, Stambulova, and Roessler (2010) showed that the athlete's social relations within and outside their sport, together with the larger context (club, sport, culture, school, private domain), play a central role in developing prospering talents. Research summarizing different case studies that have looked at talent development environments suggests that some environments are more successful than others in their capacity to guide talented junior athletes in their transition to senior elite athletes (Henriksen and Stambulova 2017). Examples of shared features of successful environments are proximal role models, inclusive training groups, training that allows for diversification, coherent organisational culture, integration of efforts, and support for the development of psychosocial skills.
Intending to identify which environmental factors influence the development and cultivation of athletes’ psychological development, Gould et al. (2002) executed 30 retrospective interviews with former Olympic athletes and their entourage. Based on the rich diversity and complexity of the findings, it was concluded that the development of skills and characteristics is a complex process with many influencing aspects stretching over a broad timespan. Six overarching themes evolved: (1) Community (the general environment that the athlete experienced while growing up), (2) Family (e.g. parents, siblings, partner), (3) Individual development (e.g. genetics, maturity, etc.), (4) Non-sport personnel (e.g. school friends and teachers), (5) Sports environment personnel (e.g. role models, competitors, trainers) and (6) The sport process (e.g. the art of training and competition, feelings and frustrations caused by the sport). All the themes/sources of influence affected the athlete’s psychological development in different ways (e.g. direct or indirect, encouragement of a certain behavior, attention and support, competition, feedback, organisation, training, experience).

While previous studies have looked at the importance of psychological factors in climbing (e.g. Hrušová and Chaloupská 2019), there is limited research that has investigated how the environment and the context influence the development of psychological factors in climbers. Following context-driven sport psychology principles (Stambulova and Schinke 2017), it is therefore relevant to examine how the sporting and socio-cultural context influences the development and implementation of psychological skills in elite Danish climbers. Therefore, the aims of the current study were (a) to gain an understanding of what psychological skills and characteristics elite Danish senior climbers perceive as important for their success, and (b) to understand how the environment is contributing to the development of these psychological factors in a niche sport.

**Methods**

**Research Design**

The current study follows a qualitative interview design and is grounded in an interpretative type of research characterized by a wish to understand and interpret people’s unique perceptions of phenomena while acknowledging that all data being generated has its roots in already interpreted knowledge (Launsøe, Rieper and Olsen 2011).

**Participants**

It was a requirement that the informants had participated in a minimum of one international competition on a senior level before the commencement of the study. Hence, all the senior Danish athletes ($n = 9$) who had climbed at the international senior level within the last five years were invited to participate, of which four climbers agreed to participate in the in-depth interviews. Two of the interviewed climbers (aged 23 and 24) are currently active on the Danish national team, and two climbers had just retired and work as coaches and route setters (aged 26 and 30). All four participants have many years of climbing experience (between 13-18 years) and had been competing both nationally and internationally as juniors and seniors.

**Instrument**

The interview was designed as a semi-structured interview. The framework of Kvale and Brinkmann (2015) for conducting semi-structured interviews guided the planning and execution of this study. The seven phases describe (1) the theme-setting, (2) designing, (3)
execution of the interview as well as (4) transcribing, (5) analyzing, (6) verifying, and (7) reporting.

The interviews were all executed based on an interview guide with a funnel-like structure starting off with background questions and ending up with more topic-specific and personal questions. The interview guide was theory-informed and included both theoretical/thematic questions such as “how do you experience resistance and what do you do to overcome it?” as well as explorative questions like “what is important for you to perform in crucial moments?”. This approach allowed for the interview situation to stay explorative while making sure to cover already established psychological aspects of elite sports. In the second part of the interview, the athletes’ experiences and development were put into a broader perspective by asking questions like “can you describe some of the environmental factors that have helped or hindered you in your development throughout your career?”. The interviews were conducted online via Zoom due to the worldwide Covid-19 pandemic. The interviews lasted between 90 and 120 minutes, were video- and audio-recorded, and later transcribed verbatim for further analyses (Kvale and Brinkmann 2015).

Analytic Approach

The empirical material was analyzed with an explorative approach following Braun, Clarke, and Weate’s (2016) six phases of thematic analysis (TA). The focus of phase 1 was to get familiar with the interview material starting during transcription, and subsequently by critically reading it through several times. In phase 2, the aim was to identify and locate something of interest to the research questions. The coding was rooted in both a semantic and a latent approach and was kept open and inclusive for as long as possible. Accordingly, 49 codes related to skills and characteristics and 31 codes related to the environment were identified in phase 2. In phase 3, the identified codes were developed into themes that could elevate the codes into having multiple layers and nuances and being able to capture the rich diversity of the dataset rather than one idea (Braun et al. 2016). In phases 4 and 5, a map of the themes and their sub-themes along with a definition of these were developed. Through cycling back and forth between the first four phases, it was made sure that no valuable theme was overlooked. In practice, this meant several additions and readjusting of codes and themes. In phase 5, relevant quotes were sorted by themes which was followed by a careful selection of final quotes in phase 6 that would be illustrative of the analysis while increasing credibility to the reader.

Ethics

The project adhered to the national ethical data protection guidelines under which the University of Southern Denmark belongs. Kvale and Brinkmann (2015) proposed general principles when conducting qualitative research including informed consent, confidentiality, consequences, and the role of the researcher. Following these principles, all participants were informed about the purpose of the study and of their rights (e.g. ability to withdraw at any time) and signed a consent form. They were informed that the data would be stored according to the GDPR guidelines and would only be used for research purposes. The participants were kept anonymous (not mentioning name, age, etc.). However, given the small number of elite senior climbers in Denmark, complete anonymity could not be guaranteed which was not a problem for the interviewed climbers. Generally, it can be difficult to revisit periods of one’s sporting career that might have been challenging, tough, and demanding. Therefore, the interviewer was aware that her presence and interrogation would most likely trigger some (own) reflections—good and bad ones. The climbers were thus informed in the beginning of the interview that they could always refrain from answering if they did not feel like it or if it exceeded their limits.
Results

The first part of the research question focuses on the importance and development of PCDEs from the climbers’ perspective. Five main themes that the climbers attributed to their success in the sport emerged through the analyses described above. These themes (i.e. focus on progress, self-reflexivity and regulation, resilience/coping, adaptability, and autonomy) are displayed in Table 1 and will be elaborated on in the following section.

<table>
<thead>
<tr>
<th>Overview of Themes Emerged from the Thematic Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subthemes</td>
</tr>
<tr>
<td>Progression and development</td>
</tr>
<tr>
<td>Goal-oriented</td>
</tr>
<tr>
<td>Motivated and persistent</td>
</tr>
<tr>
<td>Brave</td>
</tr>
<tr>
<td>Self-awareness and reflexivity</td>
</tr>
<tr>
<td>Seeking support and help</td>
</tr>
<tr>
<td>Evaluation</td>
</tr>
<tr>
<td>Regulation and adjustment</td>
</tr>
<tr>
<td>Coping with pressure</td>
</tr>
<tr>
<td>Coping with negative thoughts</td>
</tr>
<tr>
<td>Visualization</td>
</tr>
<tr>
<td>Routines to “control”</td>
</tr>
<tr>
<td>Fast adaptation</td>
</tr>
<tr>
<td>Open and curious</td>
</tr>
<tr>
<td>Creative</td>
</tr>
<tr>
<td>Self-reliant</td>
</tr>
<tr>
<td>Inner drive</td>
</tr>
<tr>
<td>Critical thinking/ using knowledge and experiences</td>
</tr>
</tbody>
</table>

Table 1: Psychological skills and characteristics expressed by Danish elite climbers

Focus on Progress

All athletes displayed a high degree of inner motivation and a drive to continuously progress in the sport. Their drive was shown by their focus on identifying and improving weaknesses rather than nursing their strengths:

Well, I have always been curious about everything that I did not yet master, or everything I could see the others doing, and then I ask myself: ‘Can I do it one day too?’ Or can I practice enough to be able to master this or that?

The athletes explained how they plan their training, both long-term and short-term, based on the vision they have of what’s required to achieve success in the sport combined with their own weaknesses and focus points:

...my training is always centered around some general focus points which I cannot achieve on Friday or the following Friday, but maybe it will take several years...
In addition to focusing on identifying weaknesses and planning based on this, the athletes also emphasized the importance of being brave in the sense that one dares to make the necessary and sometimes hard decisions. One needs to dare to expose oneself and repeatedly try despite failure. According to the athletes, a higher degree of development is achieved when they push hard and step outside of their comfort zone.

Self-reflexivity and Self-regulation

Self-reflexivity is an important characteristic both in terms of being able to navigate and get the most out of one’s training and in terms of performing for competitions by knowing when one should regulate and adjust. Underlining this, one athlete highlighted how she adjusts when registering to be in an ‘inappropriate’ state of mind in competition:

*I am good at registering when something isn’t appropriate, that is when I am too nervous and have to take a step back and think of something else…*

The athletes explained the importance of knowing one’s own values and standpoint making it easier to navigate in rough times and helping to minimize the negative influence from the surroundings. Furthermore, one of the athletes emphasized the importance of self-reflexivity in the process of accepting himself and his own process which the athlete additionally experienced and which improved his confidence. The athletes mentioned several times that they use self-reflexivity as a tool to know when and how to optimally adjust and change something in their training and planning, for example, to avoid burning out physically or mentally:

*I often stick a finger in the ground and feel where I am, both in fatigue level, but also in concentration… how much can I do and how complicated can this be or not? And if I can feel, ‘oh I’m totally fresh today’, then I quickly change focus.*

By constantly adjusting and evaluating, the athletes can ensure that their training is as optimal as possible under the given conditions, which is even more important when reaching the elite level. Moreover, the athletes highlighted the benefit of knowing one’s strengths and weaknesses when creating an effective ‘game plan’ and being able to adapt quickly based on it in competitions:

*…because there’s so much freedom in how you choose to solve the problems in climbing and bouldering, it becomes really important to know yourself and know your strengths and weaknesses, and be able to work out solutions that, yeah, are based on that knowledge, right…?*

Resilience and Coping

The ability to cope with pressure coming from the surroundings and oneself is crucial for athletes when performing and when navigating the elite lifestyle. All athletes mentioned this factor as one of their focus points regarding their own development, despite already having developed various coping strategies. All athletes agreed that ‘looking inwards’ and refocusing negative thoughts as well as accepting the ‘uncontrollable’ (e.g. nerves, outer conditions, the competitors) were amongst the most important coping factors. However, the climbers used very different strategies to achieve this goal. One athlete uses visualization, picturing an earlier ‘victory’ for boosting his confidence; another would mind-travel to a calm and quiet place far away from climbing by using meditative breathing technics; while a third had the best experiences using positive self-talk:
Under pressure, I like to repeat the same rhyme, listen to the same songs, place myself in front of the mirror and smile to myself. Small things that really work well for me. I don’t think that it’s really because it works that effectively by itself, I think it is because that’s what I’ve always done and, in that way, it reminds me of ‘well you have done that before!’ and then it takes me out of feeling pressured.

As exemplified, having an automatized routine can be helpful to find as much comfort as possible in unfamiliar and ever-changing situations. Besides trying to change one’s own state of mind, it also appears beneficial to optimize the controllable factors in the environment when facing stressful situations. One athlete explained his strategy to make the competition setup feel more like his ‘normal training routine’ by socializing with teammates or competitors or by practicing the competition setup regularly during the training sessions:

The context you train in is also the one you will get good in at climbing. If I can make the competition context feel more like my training, maybe... it can help me.

Adaptability

In climbing and bouldering, you can never be certain what you will encounter along the route. Trusting your ‘last-minute’ decisions while in action demands a high degree of self-awareness and confidence. It consequently becomes evident for a climber to train the ability to navigate and manage different options and solutions as well as quick decision-making and adjustment:

A typical mistake would be that you have read a thing, understood in the way that you have planned to do a certain thing when you climb, but if it does not work then getting stuck and keeping at it (...), so instead, you need to be able to see different solutions that you can then try out.

Being able to thrive with uncertainty is something you can practice by challenging yourself to stay curious, open-minded, and ready for a change in multiple contexts. For example, several athletes mentioned the relevance of being able to handle adjustment and changes in the actual planning and execution of their daily training sessions where work, study, or friends may “come in the way”. All athletes pointed out the importance of being able to seize such chances and then adjust the training week accordingly, as an exercise for the unknown element of climbing:

If you, as a practice for climbing, have a tightly fixed programme even though you will have to face the unknown all the time in climbing and you therefore do not train it, yeah, then it does not really fit together... The fact that it (the training plan) is a bit unknown and may change during the day is in fact also quite telling for climbing.

Adaptability is thus evident in several ways in climbing (e.g. being able to adapt and regulate the daily training, or adjust strategy, plan, or tactics on a specific boulder problem or concerning a specific climbing technique).
Autonomy

According to all interviewed athletes, the Danish climbing environment at the senior level is characterized by a high degree of individualism without the possibility of 'just' showing up for practice supervised by a coach. Instead, climbers must show autonomy and critically assess themselves what needs to be done and how it should be done, something which comes with the attendant great responsibility of developing one's own success. As an athlete exemplifies, autonomy becomes a matter of being able to independently seek out sparring and guidance, and critically choose from the overwhelming information gathered during one's career:

Now that I have grown up, there is a lot to find out, like 'okay, what can I use for something? And what is it I appreciate in a certain relation?' What can I do to improve myself and what methods and information do I stay with and what do I think should be thrown away?

The need for having a high degree of autonomy in Danish climbing is also shown by the expectations the athletes face regarding the possession of self-drive. One of the athletes highlighted how she, already as a junior, had to take the lead in organizing her competition schedule due to the Danish climbing federation's low prioritization of competitions:

Only two or three competitions per year were planned, but I had the ambition to go to 5-6 competitions a year. I remember the last 3-4 years of my junior years (until 19), I was very often alone and the only one competing in my age group.

Throughout her career, the athlete showed a great deal of inner motivation and self-drive combined with autonomy. Reflecting on these early experiences and independent trips was something she felt helpful later in her career, making it easier to critically reflect upon her own progress and the information and sparring she got from multiple sources.

The Influence of the Environment in the Process of Developing Psychological Characteristics

Four themes revolving around environmental influences on psychological development emerged from the analysis based on the interviews. The themes are separated into two main themes: 1) opportunities and 2) barriers indicating how the environmental factors, according to the athletes, either created opportunities for optimal development or were limiting it. The opportunities and barriers are listed in the table below and are explained in the following section.

<table>
<thead>
<tr>
<th>Overview of Themes and Patterns Emerged from the Thematic Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Subthemes</strong></td>
</tr>
<tr>
<td>Respect and support</td>
</tr>
<tr>
<td>Affiliation</td>
</tr>
<tr>
<td>Fun and social gathering</td>
</tr>
<tr>
<td>Relationships</td>
</tr>
<tr>
<td>Feedback and knowledge sharing</td>
</tr>
<tr>
<td>Pushing and motivating each other</td>
</tr>
<tr>
<td>Common goal and vision</td>
</tr>
</tbody>
</table>
Table 2: Opportunities and barriers within the Danish climbing environment that influences climbers’ development of psychological characteristics and skills

Opportunities

Community of Practice

All athletes highlighted the community relationship within the climbing environment as one of the main motivating factors for them to stay in the sport. The community and the relationships the athletes develop in the climbing environment—both at training and in competition—help to make athletes feel safe in their surroundings and give them a sense of belonging amongst other like-minded young athletes. Given the small number of climbers in Denmark, all talented athletes know each other well which they highlight as a benefit while competing nationally and internationally:

*It is much less intimidating to be in competitions where you know most of those who participate because then it will be a friendly meeting where you have to try the challenges that the route setter has made up for you (and your friends)*.

The community can thus help to ease some of the pressure in a competition by making it feel similar to the daily training in a friendly atmosphere. However, one athlete pointed out that he usually finds himself having higher expectations regarding his performance when he knows the competitors, thus giving him a feeling of how he theoretically should rank in relation to them. On the other hand, he also revealed that this sometimes works as an extra boost to do his very best.

The many relationships within the community give the athletes a feeling of always having someone who supports and understands them when they experience resistance or difficult periods in their career. For example, one athlete explained that he found consolation in knowing that others struggle as well since there is a culture to talk about setbacks and share them with each other. Resistance and down-periods are natural and accepted in the climbing community:

*The fact that you know that the others have also been through similar struggles helps…yeah, everyone has dealt with some kinds of challenges and, therefore, we can be in it together, supporting each other, and talking about it*.

Culture of Learning

The learning culture and the community are closely intertwined since the social community provides athletes with the opportunity to meet, challenge each other, and seek inspiration from each other to develop individually and as a group. The athletes emphasized that, in
order for everyone to develop optimally, climbers need to learn from each other and share knowledge across clubs. Sharing happens in multiple ways such as verbal feedback or common training in pairs or groups. One athlete stated that the day-to-day feedback she gets by training with others—regardless of their level—helps to make her a better climber. Training in a community increases her motivation and drive, since she typically pushes a little harder when having company, and additionally she might get introduced to new tricks and techniques. The other athletes agreed with this but highlighted that they improve most when being challenged by athletes at the same level or above, or from athletes with a different climbing style (e.g. strengths and weaknesses) than their own:

* X and I have climbed a lot together because we trained somewhat the same things and it was really nice because X and I are almost opposites in our strengths in climbing. So, in that way, when we were setting boulder problems together or for each other than it just became perfect in terms of training, since what X wanted to train and improve was typically something I was good at and vice versa.

According to the athletes, it is additionally a matter of creating a common vision in the environment to achieve international success for Danish climbing. With a common vision and a feeling of ‘us against the rest!’ (i.e. Denmark vs. the bigger successful countries), it becomes evident that sharing knowledge and experiences enhances a positive learning culture in the environment. According to the athletes, a common vision is achieved through open and honest dialogue giving not only oneself but everyone the best chances to succeed in climbing.

As described earlier, the environment requires athletes to possess a high degree of autonomy and critical thinking to be able to navigate within all the various information about training. This fluctuation of information makes it even more relevant and beneficial for the athletes to foster a learning culture where one communicates openly, shares ideas, and potentially even creates a direction for a common training philosophy. This enables athletes to independently structure their training plan and goals:

* If we had the opportunity to give each other inputs, facilitated by someone who maybe is in charge of controlling it more than what it is now... then, I think it would be easier for everyone to navigate, and I think we would all be better....

**Barriers**

**Lack of Challenges**

Nowadays, route setters set the bar for which skills climbers need in competitions, making it very important to keep updated with the current, advanced competition style. According to the athletes, keeping up to date and having enough high-quality route setting is one of the biggest problems in the Danish climbing environment. One athlete points out how this affects the skills he and the next generation will learn, including both technical skills but also the psychological skills one will need to develop highly complex problem-solving skills required by the international competition routes. The low quality and quantity of new, complex routes combined with these routes mostly being set by the best athletes themselves makes the athletes feel as if they do not meet enough new challenges in their training:
There is a lack of route setting, meaning there are not enough new ‘problems’. Most routes we create and set ourselves, and it is rarely as enlightening as if someone else sets the problems for you where you will have to do some new movements. So, because we set most stuff ourselves, we have thought the idea already [...] it is not something where we are challenged by the unknown having to think alternative options and adapt—as we would have to do in international competitions...

Besides being challenged on hard factors like facilities/route setting, all athletes also highlight the small number of talented climbers in the environment as a barrier for them to evolve and develop optimally. It is more difficult to find someone suitable to get inputs, feedback, and sparring. One athlete spoke of this limitation because this is where he finds inspiration to develop and motivation to keep pushing himself hard:

*It is easy to stagnate if you keep climbing by yourself all the time, or if everyone who is at a certain level in Denmark trains in the same way, so you won’t get much inspiration from them.*

Resistance to Change

Three of the four climbers emphasized strongly how they experience reluctance towards the modern competitive (sport) climbing and changes in general in their environment. As expressed by all athletes regarding the culture of learning, it is beneficial and desirable for all climbers to be a part of a strong learning culture where knowledge is shared and an open dialogue about how to improve, develop, and move forward exists. However, the athletes stated that even though this culture of sharing and learning does occur in some clubs and amongst some athletes, the resistance to change within the Danish climbing environment does not allow for a culture of sharing to be further established. The problem has its roots in the older traditions where climbers and clubs did not consider teaching or learning from others necessary or desirable—it was rather a secret as to how one had to become successful. As the athletes highlight, these slightly narrow-minded and selfish sub-cultures still dominate amongst several trainers and leading clubs in Denmark, making it difficult to break free of this to realize a strong culture of learning:

*The old ideas about how to do things are still being repeated ... people rarely dare to break out of old patterns and then just be creative, open and curious...*

Hence, it is a problem that some clubs and trainers prefer to continue with what they know to be safe and secure, instead of being proactive and thinking ahead as well as to keep up with the modern international developments of climbing, which undoubtedly require some changes.

*It is also about being willing to change, or at least willing to be open to the possibility of change. And there is, I think, a large part of the climbing environment that stubbornly insists that climbing should be as it always has been. And I think that is, in fact, the biggest factor that makes it difficult to develop competitive climbing and thus also develops elite climbers in Denmark.*
Discussion

The purpose of the present study was to identify psychological skills and characteristics that elite Danish climbers perceive as being important for their success in the sport, as well as how the environment affects the development of such skills and characteristics. We found that athletes possessed a high degree of self-reflexivity and -regulation, combined with a high degree of autonomy and motivation to develop and work on weaknesses. Moreover, they felt confident in adapting and coping with stressful situations, using strategies such as visualization and routines. Regarding the environment, it was especially the community and relationships as well as the learning culture that the athletes associated with their positive development. The barriers experienced include a lack of efficient challenges in the environment through which one is forced to progress to a higher level. Moreover, the athletes felt limited by an unwillingness from the environment to change the individualistic and slightly narrow-minded culture that prevails in the Danish climbing environment, thus making it hard to move forward.

The Influence of the Context on the Development of Climbers’ Psychological Skills

The elite Danish climbers are generally good at handling difficult situations and performing even when they experience substantial internal and external pressure and stress. This is consistent with MacNamara and her colleagues’ findings that ‘coping with pressure’ is an essential PCDE for elite athletes regardless of the sport (MacNamara et al. 2010; MacNamara 2011). In addition, the ability to handle high stress levels has previously been identified as a climbing-specific trait (Kiewa 2001; Serhii et al. 2020). It is therefore not surprising that climbers are additionally skilled at dealing with a high level of anxiety since the sport itself provides risky conditions requiring climbers to learn strategies to deal with high arousal states and control as much as possible (Kiewa 2001). In this study, the athletes similarly explained how they used techniques or strategies such as breathing exercises for concentration and focus, self-talk, and visualization to master challenging situations. These three techniques are mentioned as essential tools within PCDEs for prospective and elite athletes (MacNamara 2011). Moreover, the Danish climbers’ high degree of self-reflexivity, as well as their focus on working on weaknesses and towards goals, also confirms that they possess and use not only one but several of the already known PCDEs.

Besides the well-known PCDEs, the athletes emphasized that being an elite athlete in the Danish climbing environment requires especially a high degree of autonomy. In individual sports, it is not so surprising that some degree of autonomy is a prerequisite for getting to the top. However, environmental constraints in Danish climbing reinforce individualism since athletes after the junior years are on their own without organised team training. Consequently, athletes must be able to initiate, regulate, and adjust according to resources, time, physical, and mental conditions as well as external surroundings. Autonomy is not in itself a part of MacNamara’s (2011: 59) PCDEs, though several of the PCDEs (including goal setting) are described in terms of actions such as ‘the athlete can independently set short- and long-term goals’. In this study, however, it became clear that autonomy is not only a sub-branch of other PCDEs, but an essential psychological characteristic to possess as a Danish climber.

Supporting the hypothesis of Dohme and colleagues (2019) as well as MacNamara et al. (2010b), this study’s findings of climbing-specific characteristics and skills suggest that certain PCDEs are obviously more domain-specific. Adaptability has not yet been described as an essential PCDE in elite sports. However, Serhii and colleagues (2020) highlighted how climbers with a good ability to adapt and adjust quickly have a higher stress tolerance.
which supports the idea that adaptability is an essential skill in climbing where stress and risk is ever-present. In this study, the athletes attributed the need for quick adaptations and adjustment according to one’s weaknesses and strengths, not only to the stress and risk but also to solving problems in unique and changing competition routes.

Opportunities and Barriers in the Danish Climbing Environment

In the absence of some of the pillars that the SPLISS study (De Bosscher et al. 2015) highlights as necessary to achieve the required standards for international elite sport (e.g. large talent mass, specialized talent development programmes, high-class facilities, and adequate coaching) in Danish climbing, our data showed that to reach an elite level in Danish climbing, the athletes need to compensate for some of its weaknesses. The climbers emphasized how the community in the climbing environment (including peers and coaches) had a substantial positive influence on their development of essential skills along with their motivation to develop and stay in the sport. Similarly, several previous studies have found that family/friends or a long-term coach can have an especially great impact on athletes' successful development (Elbe and Wikman 2017; Gould et al. 2002). Despite the generally positive influence, the athletes also highlighted that some people in their environment had a limiting impact instead (e.g. coaches being narrow-minded, not wanting to collaborate or share knowledge across clubs). Consistent with Gould et al. (2002), the athletes in this study experienced the various relationships throughout their career as helpful for their development in different ways. Amongst these were the feeling of belonging to a tight and supporting community that increased their self-esteem, and the desire to stay in the sport as well as the mental support from athlete-peers who experience similar struggles. Additionally, providing support in the form of 'social security' in competitions made it easier for athletes to feel comfortable and focus on performance. Furthermore, the community and relationships provided fruitful ground to push each other and compete in practice as well as share knowledge in a positive learning culture (Henriksen et al. 2010).

The athletes perceived the lack of challenges in the environment and resistance to change as main barriers to developing psychologically and physiologically. The lack of competition from other (i.e. better) climbers in their daily environment as well as the low complexity and quantity of routes to challenge them were especially highlighted as a barrier. As Collins and MacNamara (2017) emphasized, when the environment does not naturally challenge you, it could be relevant to stage resistance. However, in small countries like Denmark where the climbing sport has a lower budget and status than more popular sports like soccer or badminton, it might be artificial to stage sport-related challenges and resistance. The environment’s lack of financial and organisational support results in athletes being on their own without proper facilities to develop climbing-specific skills that are crucial to becoming a world-class climber (Saul et al. 2019). As highlighted by Collins and MacNamara (2017), the feeling of constantly being challenged is key to equip athletes with coping strategies that help to overcome the many struggles arising during an elite athlete’s career.

Danish climbing per sé cannot be categorized as successful, having never had an international podium. Furthermore, as athletes highlighted, there is neither enough inspiration to be found nor enough knowledge and experiences to be shared in this small community. A typical characteristic of a successful talent development environment is the understanding that “learning is most efficient in communities in which there are no secrets since everybody improves when knowledge is shared” (Henriksen et al. 2010: 218). What is really needed to be at the absolute top in sports climbing is rather unknown to
the best Danish climbers since no one so far has had international success. This can be problematic for the best athletes, as close and inspirational role models have been shown to have a positive influence on athletes’ development in their sport (Henriksen et al. 2010; Martindale 2011).

Limitations

Despite the interesting findings, some limitations need to be addressed for this study. One limitation of the study is the narrow perspective brought to bear on the topic. Only the views of a handful of athletes were explored, neglecting both family and coaches’ perspectives on the athletes’ skill development and the Danish climbing environment. Additionally, many of the climbers’ perspectives deal with the interpretations of past events that could be influenced by a recall bias. Furthermore, coding and analyses were conducted mainly by the first author with merely critical inputs from colleagues and the second author. The findings represent many of the traits of the Scandinavian sport system that is based on voluntarism, collaboration, and consensus, which limits generalization to other cultural contexts.

Practical Implications

Based on the study findings, we provide some recommendations. First, coaches are advised to apply an autonomy-supportive approach in talent development and athletes’ support (Conroy and Coatsworth 2007). Former top athletes could be used as role models to help young athletes develop a broad asset of PCDEs. Second, ongoing coaching education with international inputs or study visits abroad could help to minimize the gap between international top-standard and old-fashioned ways of training. All athletes emphasized their interest in more coaching and team training opportunities in the environment. However, it became clear that the athletes favored individualized coaching strategies that evolved during their careers. This requires great dedication from the (mainly) volunteering coaches and stronger structural support may be necessary to realize this form of practice and approach. Third, bringing international competitions and top foreign elite climbers on the home ground could serve as a springboard for inspiration and could increase the competitiveness of local talents and athletes. Future research could include the perspectives of coaches and sport managers to broaden the knowledge about the barriers and opportunities of small sports, and further inquiries into different cultures and sport systems are needed to better understand the development of the psychological skills of athletes in specific sports.

Conclusion

The current study provides some sport-specific and cultural insights into the performance and skills development of elite Danish climbers. The study highlights that individual skill development is highly dependent on the environmental setup with its opportunities (culture of learning among climbers) and barriers (lack of climbing-specific challenges and competition). In the absence of an elite sport setup with professionalised coaching and state-of-the-art facilities, athletes from this niche sport are forced to create an environment by themselves to facilitate each other’s development through strong communities of practices. Autonomy and adaptability seem to be both pre-requisites to reach elite level in Danish climbing but also important skills to compete internationally.
References


Kvale, S., Brinkmann, S. 2015. Interview - det kvalitative forskningsinterview som håndværk [The qualitative research interview as a craft]. Hans Reitzels (København).


