DISSERTATION FROM THE
NORWEGIAN SCHOOL OF
SPORT SCIENCES
2019

Hedda Berntsen

Teaching and understanding “need supportive” coaching

Developing and implementing a coach development program

NIH NORWEGIAN SCHOOL OF SPORT SCIENCES

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Dedication

The girl who was pushed to train when in pain, resulting in an end of career injurie

The injured girl who did not receive any visit or calls from her coaches

The girl who did not ski for eight years

The girl who burned her skis

and all other athletes who had coaches who misunderstood what good coaching is

Acknowledgements

First, I want to thank all my coaches –I am grateful for each one of you. I know how important a good coach is, and your efforts play a crucial role for athletes in their everyday pursuit. This insight inspired this research project. Next, I want to thank the Norwegian School of Sport Sciences (NIH) and the Norwegian Research Centre for Children and Youth Sports (FOBU) for giving me the opportunity to complete my doctoral degree. Hence, thanks to professor Nicolas Lemyre for believing in the project and landing the collaboration between NIH and the Norwegian Olympic and Paralympic Committee and Confederation of Sports (NIF), the Norwegian ski federation (NSF), FOBU, and the Ministry of Culture (KUD). Thank you Anja Veum (NIF) and "Ante" Antero Wallinus-Rinne (NIF) for acknowledging the importance of gaining understanding regarding how to increase coach knowledge to enhance athletes' experiences though sports.

The NSF has played an important role in this project. First, Connie Hagen, from the Buskerud Alpine Team helped create and implement *the Buskerud Project* to increase our understanding about the youth context. We presented motivational strategies followed by a discussion with the coaches and athletes in the Alpine skiing clubs in Buskerud. Thanks to Jørund Li (Buskerud Alpine Team) and all the parents and athletes who shared their experiences and thoughts. Next, the NSF education group was positive about the project from the start, and I really appreciated the collaboration in the early stages. Thanks, Per Elias Kalfoss for being such a positive influence, Helen Ingebretsen, thanks for being so engaged in the development aspects of the ski sport, and for inviting me to the FIS fall meeting in Zurich to present my project and attend clinics. Eivind Gjeraker, my visionary friend, thanks for involving me in developing educational videos (for dryland and ski), inviting me to Hafjell with freestyle and for your passion for skiing (ski-mania). Thanks for joining the filming of the videos for the project and for being involved in your special way. You are great! Finally, when developing the learning material, the NSF involved Morten Nordli to film and edit. Thank you, Morten, for doing a great job, and for our collaboration on the voice-overs. You really have an eye for art.

This brings me over to NTG. I want to thank all the athletes and coaches who "acted" in the video fragments. The "bad coach" or "to do a Bendik" has now become a term. Bendik, your way of interpreting the role of "bad coach," and Kenneth's interpretation of "good coach" made the videos work. Thank you both. Athletes did a phenomenal job getting the message across, it does matter how the coach acts. Thank you "Toffa" Torleif Gunhildrud for being so

positive and engaged with athletes and sports. Thanks to the rector at the interventions school, and all the coaches, athletes, and teachers for making this research project possible. I want to thank all the coaches for participating in MAPS. It was great to present the learning material, discuss and have one-on-one sessions with you all. You all thought me a lot. I am also thankful for feedback and questions you have asked, making me try to make the link from theory to practice clearer, and to see the complexity.

My amazing cousin Camilla Jødal did the layout of the digital workbook and the figures. I love your work. Thank you, Camilla, for always saying "yes"! When designing the workbook, I needed more information about multimedia learning. Thank you, Professor of Education, Professor Glenn-Egil Torgersen from the Norwegian Defence University College, Akershus Fortress, Oslo. I was lucky to be invited into the military grounds and get a private introduction into the science of learning and the cognitive theory of multimedia learning. Additionally, I am grateful to Dr. Torgersen for taking the time to read through my article, for his books, and article suggestions. Learning is indeed still one of my passions.

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I am forever grateful for the collaboration with and mentoring by the great Professor Elsa Kristiansen. In my experience, you are the most professional, kind, caring, direct, predictable, phenomenal academic. Elsa, you stepped in when I was extremely frustrated. To get feedback on my work, and in due time was a new and welcome reality. You are a master in offering feedback in such a way that I feel competent – information about what is good and

suggestions for how I can improve (need-supportive strategy 6). You make me feel that you care about the project and me, as person – and the relatedness need was satisfied (strategy 1). Finally, you give me the room to feel ownership of the project and articles and made me feel like an *origin* rather than a *pawn* to quote De Charms from 1968. Your contribution has been invaluable. Thank you, Andreas Ivarsson, for contributing your statistical knowledge; it has increased the quality of my work. It has been fun to work with you and discuss hypothesis and which analysis to use. Thank you, Barrie Houlihan, for *the* continuum. I want to thank Aage Radman and Susann Hedenborg for a great qualitative method course in the fall of 2017. The Motivational Interviewing course led by Professor Michelle Fortier was fruitful regarding the mechanisms of motivational regulations, as was the interesting discussions with Fortier. "The Publishing Game" led by Glyn Roberts was great. I also want to thank Gerda Wever for her superb proofreading.

I want to thank Tyler Conrad for standing by my side throughout this time of extreme demands and struggle. Thanks for being patient with and supportive to me, for playing sports with me and for helping me relax when I need to, I love you. As always, my Dad came to the rescue, he translated the surveys with me, and most importantly encouraged me to be strong when having to make difficult decisions. He taught me to stand up for myself and be angry rather than sad. When I was 14, my brother gave me textbooks for Christmas. Now he gave me statistic books and installed a huge white-board in his living room, so we could discuss Bayesian Statistics and attempt to find useful results from the intervention despite not having a control group. Thanks to Marcia Conrad and my Mom for being caring and understanding, and reminding me to go ski and have fun, and thanks to my sister Ingrid for believing in me.

List of articles

Article 1

Berntsen, H. & Kristiansen, E. (2019). Successful coach learning: Digital workbook informed by pedagogical principles. *International Journal of Sports Science and Coaching.* DOI: 10.1177/1747954119835439

Article 2

Berntsen, H. & Kristiansen, E. (2019). Guidelines for Need-Supportive Coach Development: The Motivation Activation Program in Sports (MAPS). *International Sport Coaching Journal*, 6 (1), 88-97. DOI: 10.1123/iscj.2018-0066

Article 3

Berntsen, H., Ivarsson, A., & Kristiansen, E. (Submitted) Need-supportiveness and athlete wellbeing. *Motivation and Emotion.*

Article 4

Berntsen, H. & Kristiansen, E. (2018). Perceptions of need-support when "having fun" meets "work hard" mentalities in the elite sport school context. *Sport Coaching Review.* DOI: 10.1080/21640629.2018.1525862

Summary

The aim of the thesis was to contribute to an understanding as to how to increase coach knowledge to enhance athletes' experiences from sports. The primary aim of the study was to understand how to create a coach development program specifically for coaches' need-support. The second aim was to understand need-supportive coaching and its influence on athlete well-being and autonomous functioning. The content of the coach development program is based on self-determination theory, and learning theories informed how to plan for coach learning of the need-supportive coaching skills. I developed the *Motivation Activation Program in Sports* (MAPS) and implemented it at one of the six schools of the Norwegian College of Elite Sport (NTG) during the 2016/2017 academic year among 10 coaches and 102 students.

Developing and Implementing the Motivation Activation Program in Sports (MAPS)

Article 1 discussed the design of a digital workbook that was informed by evidence based pedagogical principles, more precisely the cognitive theory of multimedia learning. Ten coaches at one of the NTG schools attended the program over a season, and afterwards the coaches were asked whether the learning material had contributed to meaningful learning of need-supportive skills. The pedagogical principles in the used digital workbook showed the coaches *how* need-support can be acted out in a sport specific context. Additionally, the learning material resulted in increased engagement and awareness through coaches' reflections, which is an important step towards integrating new material to prior knowledge and create meaningful learning. Finally, the coaches highlighted transfer of the presented learning material to their lived experiences as a positive outcome.

Article 2 examined impact evidence of MAPS and whether the developed program had been successful in teaching coaches how to act need-supportive toward their athletes. The article explains how the program was delivered at NTG throughout the 2016/2017 season as a test trial. First, a detailed description of the conceptual framework used to inform MAPS is offered. Next, a thorough description of MAPS building components is provided. The third section of the article presents impact evidence of coaches' learning experiences together with coaches' practice examples of need-supportive coaching skills. Results reveal that MAPS taught coaches about need-supportive skills at the intrapersonal (awareness of own coaching practice) and interpersonal (interaction with athletes) level. In addition, effective need-support

for athletes required sufficient time for each athlete, a gradual approach to athlete understanding, and a thorough consideration of specific situations.

Understanding need-support

Article 3 explored quantitatively how coaches' behaviour affected athletes' well-being. In a sample of 102 NTG student athletes, the within-person relationship between need-supportiveness and subjective vitality was investigated. They completed three questionnaires over an academic year (beginning, middle, and end), and Bayesian growth curve analyses revealed that the levels of relatedness and autonomy-support were stable and high throughout the year. In contrast, competence-support decreased during the season. In addition, the results showed a credible positive within-person relationship between changes in all three facets of need-supportiveness from the coach and vitality measured at the end of the season.

Article 4 investigated athletes' and coaches' perceptions of coach need-supportive behaviour and the athlete-coach dynamic in the endorsement process. Video-based interviews were conducted with 11 (of the 102) athletes and the 10 coaches from the same school. The interviews were analysed, and narratives were used to illustrate the story of the predominantly *hedonic athlete* (the aim of sport participation is having fun) and the predominantly *eudaimonic athlete* (the aim of sport participation is development). There was an obvious endorsement misfit between the group of athletes labelled hedonic and their coaches due to the expectations and demands of the elite sport school context. The paradox of the endorsement process intensifies when the "have fun" mentality of the athlete meets the "work hard" mentality of the coach, which, for some athletes, undermines their need-satisfaction, commitment, performance, and well-being. The findings suggest a strong need for a fit between coach and athlete aims for successful coaching in the elite sport school context."

Guidelines for need-supportive coach development is the main practical contribution of this thesis. The use of learning theories to plan coach learning is suggested, as well as explicit coaching skills and videos fragments to present the need-supportive style. The theoretical contribution is the coaches' learning process model that incorporated meaningful learning as nexus, and a more nuanced understanding of the endorsement process. Based on our investigation it is proposed that future research concentrates on person-environment fit to understand how to facilitate an athlete created sport context that facilitates youth athletes' flourishing.

Sammendrag

Hensikten med dette PhD-prosjektet var å bidra til økt kunnskap om hvordan å øke treneres samhandlingskompetanse for å bedre utøveres opplevelse i idretten. Trenerkurset *Den støttende treneren: Hvordan tilrettelegge for motiverte utøvere, trivsel og sportslig utvikling* ble implementert på en av de seks skolene til Norges Toppidrettsgymnas (NTG) i 2016/2017. Ti trenere og 102 utøvere deltok i denne intervensjonen.

Del 1: utvikling og implementering av trenerkurset

Artikkel 1 viser hvordan den kognitive teorien om multimedia læring ble brukt for å designe et digitalt trenerhefte. Dette inneholdt videoer (en for hver støttende strategi) og oppgaver – i tillegg la det grunnlaget for de tre workshoppene som utgjorde trenerkurset. De ti trenerne gjennomførte trenerkurset høsten 2016. Våren 2017 ble trenerne intervjuet og spurt om læringsmateriellet hadde bidratt (eller ikke) til meningsfull læring av de støttende trener-strategiene. Trenerne uttrykte at det digitale trenerheftet økte deres forståelse av hva den støttende stilen betyr i deres idrettskontekst. I tillegg hadde læringsmateriellet, spesielt videoene, ført til at de ble mer bevisst egen trenerstil gjennom refleksjon av egne og andres erfaringer. Trenernes engasjement er viktig for å integrere den nye kunnskapen til eksisterende erfaringer fra praksisfeltet. Da først vil den nye kunnskapen blir meningsfull for dem. Flere av trenerne opplevde at det digitale heftet hadde bidratt til økt forståelse av sammenheng mellom teori og egen erfaring, et viktig steg mot endret treneratferd.

Artikkel 2 fokuserte også på trenernes læringsutbytte, men problemstillingen her var i hvilken grad de tok i bruk støttende strategiene og hadde endret atferd. Artikkelen fokuserer på trenernes erfaringer med implementering av trenerkurset på NTG gjennom 2016/2017 sesongen – og i hvilken grad de bruker de støttende strategier oftere og på en bedre måte i hverdagen. Resultatene viste at kurset hadde lærte treneren om de støttende strategiene. Det ble videre hentydet at for å lykkes med den støttende stilen, er det avgjørende med (a) tid til hver utøver, (b) at implementering må skje i samsvar med utøveres modningsnivå, og til slutt (c) at støttende strategier må tilpasses ulike situasjoner.

Del 2: Å forstå den støttende trenerstilen

Artikkel 3 fokuserer på endring over tid i utøvernes opplevelse av treneres støttende stil og hvordan den er relatert til utøveres trivsel. Utøverne svarte på spørreskjema på tre tidspunkt gjennom året (begynnelsen, midten og slutten). De tre aspektene ved den støttende stilen ble undersøkt (autonomi, kompetanse og tilhørighet). Bayesiansk statistisk analyse viste at tilhørighetstøtten og autonomistøtten var høy og stabil på alle tre tidspunkt.

Kompetansestøtten falt gjennom året. Resultatene viste en positiv statistisk signifikant relasjon på individnivå mellom endringer i alle tre dimensjonene av behovsstøtte fra treneren og subjektiv vitalitet på slutten av sesongen. På bakgrunn av funnene oppfordres trenere til å legge ekstra fokus på de kompetanse-støttende strategiene i elitekonteksten.

I **artikkel 4** framheves trener-utøver dynamikken, og hvorvidt utøverne aksepterer trenerens struktur. Videobaserte intervjuer ble gjennomført med 11 (av 102) utøvere og alle 10 treneren på NTG. Intervjuene ble analysert, og gjennom to narrativer ble historien til den utpregede hedoniske utøveren ("ha det gøy" innstilling til idrettsdeltakelsen) og den utpregede eudaimonske utøveren ("utvikling-innstilling" til idrettsdeltakelsen) fortalt. For sistnevnte var det få problemer, mens for den hedoniske utøveren og treneren – var det manglende samsvar i innstilling til idrettsdeltakelsen og mangel på aksept for trenerens struktur. Aksept for trenerens struktur (at regler og treningsaktivitet er meningsfull) er avgjørende for opplevelsen av støtte fra treneren. Skolens strukturer kan dermed oppleves som utfordrende hvis utøver ikke forstår hensikten og dermed ikke har en reell mulighet til individualisering. Studien indikerer viktigheten av samsvar mellom treneren og utøverens innstilling til idrettsdeltakelsen for suksessfull støtte i elitekonteksten.

Det praktiske bidraget fra avhandlingen er trenerkurset *Den støttende treneren.* På bakgrunn av funnene i studien oppfordres det til å bruke læringsteorier, og at det kan være hensiktsmessig å bruke videoer for å praktisk vise teoretiske begreper ved utvikling av andre trenerkurs. Det er to teoretiske bidrag fra avhandlingen er (a) trenerens læringsprosess modell der den meningsfulle dimensjonen vektlegges som link mellom teori og praksis, og (b) viktigheten av samsvar mellom konteksten og utøveres innstilling til idrettsdeltakelsen for å forstå når utøvere aksepterer (eller ikke) strukturen til treneren.

List of publications based on the dissertation

Berntsen, H. & Kristiansen, E. (2019). Feilaktig syn på hva som er god "coaching" gir utbrenthet, frafall og mistrivsel. Derfor bør treners samhandlingsferdigheter kvalitetssikres på lik linje med idrettsspesifikk-kompetanse. [Wrong beliefs about coaching results in burnout, drop out and ill-being: Coaches interpersonal skills are important] (chronicle). www.nih.no

Berntsen, H. & Kristiansen, E. (2018). Perceptions of need-support when "having fun" meets "working hard" mentalities. *Conference on Motivation, University of South-Eastern Norway*.

Berntsen, H. & Kristiansen, E. (2018). Derfor blir idrettsungdom drittlei! (chronicle). [Why youth get fed up with sports]. *www.forskning.no*. Most read chronicle 2018.

Berntsen, H. & Kristiansen, E. (2017). Transfer problems in coach education. *Nordic Sport Science Conference, Halmstad, Sweden*

Berntsen, H. (2017). Slik dreper du idrettsgleden til barnet ditt (chronicle). [How you smother your child's love for sports] *www.forskning.no*. 61 000 reads.

Lemyre, P-N. & Berntsen, H. (2016). Eierskap over drivkraften til å drive med idrett [Ownership of the energy to participate in sports]. I: *Ungdomstreneren*. A. Wallinus-Rinne (red.). Oslo, Norway: Akilles.

Berntsen, H. & Hagen, C. (2016). Presentation "the Buskerud Project" (oral presentation) *Annual Meeting, Buskerud (one of Norways 19 counties) Regional Ski Confederation*

Berntsen, H. & Gjesdal, S. (2015). Bredde er topp [When recreational sports turn elite] (chronicle). www.nih.no

Berntsen, H. (2015). What motivates athletes? *Norwegian Sport Galla Conference (Speech)*

Berntsen, H. (2014). Play or early specialisation, in youth sport? *Youth Sport Conference, Norwegian Confederation of Sports*, Gardermoen, Norway (oral presentation)

Berntsen, H. (2014). Autonomy-supportive coaching strategies- for the love of skiing. *FIS Autumn Meeting 2014, Zurich, Switzerland (Oral Presentation)*

Berntsen, H. (2014). Autonomy-supportive strategies *Club Five International Annual Meeting, Brussels, Belgum (Oral presentation)*

Abbreviations

MAPS The Motivation Activation Program in Sports

BPNT Basic Psychological Needs Theory

CDP Coach Development Program

FOBU The Norwegian Research Centre for Children and Youth Sports

KUD Ministry of Culture

NIF The Norwegian Olympic and Paralympic Committee and Confederation of Sports

NIH The Norwegian School of Sport Sciences

NSBF Norwegian Snowboard Federation

NSD The Norwegian Centre for Research Data

NSF The Norwegian ski federation

NTG Norwegian College of Elite Sport

OIT Organismic Integration Theory

SDT Self-Determination Theory

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INTRODUCTION

Hedda's story. Throughout my career I observed that some athletes quit skiing as a result of negative experiences. It made me wonder why they went from loving their sport to feeling frustrated and hating it. The aftermath of quitting sports for these reasons can be detrimental to the individual athlete. Such as remaining bitter as they experience their dream to be thwarted and remain feeling like a failure. Unfortunately, I think that some of these athletes might always wonder "what if?"

SERIE: KVINNEMYSTERIET

Stina Hofgaard Nilsen er alpinstjerna Norge mistet

VAR BEST I VERDEN: Allerede 22 år gammel vant Stian Hofgaard Røsjø, tidligere Hofgaard Nilsen, sin første verdenscupseier i storslalåm og var jevnlig på pallen. Likevel ble ved løper, norske flagg og nasjonalsangen aldri en så stor del av hennes liv som mange trodde. 24 år gammel forsvant gullhåpet fra idrettsverden. Foto: Nina Hansen

Stina Hofgaard Nilsen, som hun het tidligere, var på full fart mot å bli den kvinnelige alpinstjerna Norge trengte med verdenscupseier og regelmessige pallplasseringer som 22-åring. Så forsvant hun.

SNØDRONNINGEN SOM FORSVANT

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«Vår nye snødronning» skrev Dagbladet i januar 2002.

Stina Hofgaard Nilsen var 22 år gammel og på god vei mot å bli verdens beste storslalåmkjører med resultatrekka 5-5-3-2 den sesongen. Eventyret var så vidt i gang.

Dagen etter, 28. januar 2002, tok hun steget øverst på pallen og vant sin første verdenscupseier i karrieren, i storslalåmrennet i Cortina d´Ampezzo. Endelig skulle det ta helt av.

22-åringen fra Bergen seilte opp som en gullkandidat til OL i Salt Lake City i 2002. Skulle Norge endelig få en kvinnelig verdensener, en profil på høyde med Kjetil André Aamodt og Lasse Kjus?

To år seinere, i mars 2004, lå hun imidlertid opp bare 24 år gammel.

En lysende karriere var plutselig over.

– Hvor ble det egentlig av henne? spør sportssjef i norsk alpint, Claus Ryste, i intervju med Dagbladet i forbindelse med prosjektet «Kvinnemysteriet».

Skjebnen til Hofgaard Nilsen - som i dag heter Hofgaard Røsjø - er på mange måter veldig treffende for den største utfordringen i den mannsdominerte norske idretten.

Ingen oppfølging

Norge har hatt nok av store kvinnelige talenter, men altfor mange av dem har gitt seg tidlig før potensialet er nådd.

Stina Hofgaard Røsjø, som i dag er 39 år gammel, har levd 14 år utenfor idretten etter at hun ga seg som en av verdens mest lovende alpinister. Livet i dag er veldig bra, men i møte med Dagbladet reflekterer hun over hva som gikk galt.

– Jeg hadde ikke én samtale eller noen form for oppfølging da jeg valgte å slutte. Ingen reagerte. At det ikke var et system som fanget meg opp da jeg gikk fra å prestere bra til dårlig, har jeg tenkt mye på at er rart. Det opplevdes som om ingen stilte opp da jeg var i en sårbar periode og tok et vanskelig valg. Det har jeg vært lei meg for. Det er noe uforløst som ligger der. Jeg kunne omtrent ha skrevet ei bok om alt jeg ville ha gjort annerledes, både som utøver og trener, sier den tidligere norske alpinprofilen til Dagbladet.

Til slutt fikk alpinesset nok.

– Hedda Berntsen ga seg på alpinlandslaget også rundt da. Hun var kjempefrustrert og kom med krass kritikk den gang, mens jeg trakk meg helt tilbake. Jeg orket ikke mer. Jeg hadde alpinsporten helt oppe i halsen. Det var noe som var feil den gang. Jeg håper og tror det er bedre i dag, sier 39-åringen.

– Vi var et bra lag med flere som hadde gode resultater. Andrine Flemmen og Trine Bakke hadde vært gode en stund. Så var det meg, Hedda og et par andre som var oppe i toppen. Så skjedde det noe rundt år 2002. Resultatene mine gikk nedover.

Supertalentet

Tilbake til den gode, fruktbare tiden i alpinbakken:

Stina Hofgaard Røsjø, som da het Hofgaard Nilsen, hadde et enormt talent i spesielt storslalåm og en skifølelse som svært få andre. Etter kjempesuksessen i 2001/02-sesongen seilte hun opp som en gullkandidat i OL i Salt Lake City, bare 22 år gammel.

– Jeg hadde en grunnleggende feeling for underlaget som jeg tror er medfødt. Jeg trodde karrieren skulle vare mye lenger enn den gjorde. Men da det begynte å gå dårligere, fant jeg ikke ut hva som var feil og det var veldig frustrerende, forteller 39-åringen fra Bergen.

– Både Andrine Flemmen og jeg hadde

→ FORTS. NESTE SIDE

Youth sports participation has the potential to foster positive physical and psychological benefits (Fraser-Thomas, Cote, & Deakin, 2005; Jayanthi, Pinkham, Dugas, Patrick, & LaBella, 2013). Unfortunately, organized sports may also be harmful for (youth) sports participants as it can result in burn-out, drop-out, and general ill-being (Baker, Cobley, & Fraser-Thomas, 2009; Bean, Fortier, Post, & Chima, 2014). These negative experiences from sport participation are regularly displayed in the media. One such story was published November 30, 2018: "The snow queen who disappeared" (Godø & Lübeck, 2018). Stina Hofgaard Rosjø was interviewed 14 year after retiring from elite alpine skiing. Stina podiumed in World Cup races when she was 22 year old and was considered Norway's up and coming star. In the article, she reflects on what went wrong when she retired 24-years old, only two years after her World Cup victory. As her results declined, so did the support from the coaches and the team, and she ended up feeling very alone in her endeavours. Her well-being suffered. When, in frustration, she quit, not one of the coaches or representatives from the ski federation attempted to understand why or communicated that she would be missed. Unfortunately, her story is not exceptional.

To avoid the negative consequences of sports participation, literature stresses the importance of the sport environment for athletes' well-being, enjoyment, and development (Bean et al., 2014; Côté & Gilbert, 2009). Coaches are often responsible for shaping the social environment of athletes (Gilbert & Trudel, 2004; Matosic, Ntoumanis, & Quested, 2016).

Stina's case illustrates why coach interpersonal knowledge is of great importance for athlete well-being and development. When coaches don't know the importance of interpersonal skills then it becomes a matter of luck whether an athlete has a coach with interpersonal knowledge i.e., someone who knows how to communicate, asks about and acknowledge athletes' feelings, gives feedback in a way that supports competence, and who creates social environments that foster relatedness and team culture – which may be crucial for his/her prolonged involvement in sport. Furthermore, coaches acting from false beliefs about what "good coaching" is are not to blame when the system they work within does not make sure coaches are properly educated.

The purpose of this thesis was to investigate how to increase coach interpersonal knowledge and develop a coach development program that teaches coaches how to use interpersonal skills, ultimately enhancing athlete sport experiences.

THEORETICAL FRAMEWORK

Hedda's story: "Back in the fall of 2009, while training for the Vancouver Olympics, I was a Master's student in philosophy of education at the University of Oslo. That fall, we started studying theories on human motivation. Reading about self-determination theory and the implications of the different coaching styles on athlete experiences made me think; "this is important for all coaches!" Why is not this part of coach education curriculum? "The idea that coaches need to know that their behaviours influence their athletes' motivation, performance and well-being" was born. I decided that I wanted to better understand coach education and learning to make sure an interpersonal perspective was included in the Norwegian Ski Federation learning material; at the time it was not much more than a section on the role of the coach"

The theoretical framework for this thesis is a combination of self-determination theory, which the content was based on, and learning theories used to plan for coach learning.

"Good coaching" in Self-Determination Theory

Self-determination theory (SDT), first formulated by Deci (1975) and extended by Deci and Ryan (Deci & Ryan, 1985, 2000; Ryan & Deci, 2017), is an organismic theory of human behaviour that is focused on the ways in which social contextual factors influence peoples' thriving and growth. The theory explains how a need-supportive interpersonal style is associated with adaptive athlete outcomes, which is why we chose to inform our intervention on SDT. Below I offer a presentation of the theory.

Motivation in SDT

"To be motivated means *to be moved* to do something" (Ryan & Deci, 2000, p. 54). The theory distinguishes between three types of motivation. *Amotivation* can be described as athletes going through the motions with no intention to act and thus having non-regulation. *Extrinsic* motivation leads athletes to engage in behaviours because of the instrumental value of the behaviour (to gain a reward, avoid punishment, or attain valued outcomes). This form of motivation includes four major types of motivational regulations: external, introjected, identified, and integrated. Through the process of internalization, athletes can adopt values, beliefs, or behavioural regulations from the sport context and make them their own. Successful internalization leads to athletes practicing their sports, also when the coach is not there to monitor them. The "cornerstone" of SDT's theoretical foundation is the concept of *intrinsic* motivation (Ryan & Deci, 2017). Intrinsically motivated athletes act because the activity is inherently satisfying (enjoyable and interesting) to them (Deci & Ryan, 2002). According to the theory, intrinsic motivation is both a basic and a lifelong psychological growth function within humans.

Central to SDT is the distinction between types of motivation along a continuum from controlled to autonomous and is based on the finding that higher relative autonomy is associated with greater quality behaviour and persistence (Ryan & Deci, 2017). The implication of autonomous motivation is that athletes engage in an activity with a full sense of willingness and volition, and according to the theory, intrinsic motivation is the only true form of autonomous regulation. In contrast, controlled regulated athletes feel coerced to practice (or do other sports specific activities) in specific ways. Extrinsic motivational regulations are not inherently satisfying, and extrinsic incentives are needed to act. Extrinsic regulations vary in

their degree of autonomy along the relative autonomy continuum, spanning from relatively controlled (external and introjected regulations) to relatively autonomous (identified regulation and integrated regulation) (Deci & Ryan, 2000, 2002). The least autonomous form of the internalization process is termed *external regulation*. When externally regulated, athletes act to satisfy an external demand or fulfil a social condition (Deci & Ryan, 2002). A controlling coach or parent uses demands and controls to get the athlete to act in a specific way. Sometimes coaches use rewards to tempt and manipulate the athletes' actions. *Introjected regulation* is also a quite controlling form of motivation, but the person controls his or her own actions to avoid guilt and shame or to attain self-esteem (Deci & Ryan, 2002). An example of the introjection-based behaviour can be the athlete who regulates her behaviour by completing many runs in the giant slalom course to avoid feeling guilt. *Identified regulation* takes place when an athlete recognizes the importance of a certain behaviour to reach a goal; it is a conscious valuing of a behavioural goal (Deci & Ryan, 2002). If skiing fast is important for an athlete, and that athlete knows that strength training is necessary to resist the forces in the turns, which is important to ski fast, she chooses to do this type of training even though she still finds this activity not enjoyable in itself. The behaviour is still extrinsically motivated as a means to reach a goal, but it is more self-determined than the two former regulations. The most complete form of the internalization process of extrinsic motivation is *integrated regulation.* When acting from integrated regulation, the athlete has fully accepted the behaviour necessary to reach the associated goals, and this becomes part of the athletes' identity, values and lifestyle. Integrated regulation is self-determined and based on the athletes' choice that fits with other elements of the self, such as values, goals, or needs (Deci & Ryan, 2002; Vallerand, 2007). The different regulations can coexist within the sports domain and several of them can be operative within the same practice session (Ryan & Deci, 2017). To sum up, autonomous regulation, when athletes wholeheartedly engage in the activity and practice to become more skilled players because it is enjoyable or important to them, is associated with athletic development, sustained sports participation, enjoyment and well-being. Tapping into this motivation is preferable when working with young athletes (Balaguer et al., 2012; Carpentier & Mageau, 2013; Felton & Jowett, 2015).

Outcomes associated with controlled and autonomous motivation

The distinction between autonomy and control, two qualitatively different modes of functioning, have been empirically supported (Deci & Ryan, 2000; Moller, Deci, & Ryan, 2006; Vansteenkiste, Niemiec, & Soenens, 2010). The differentiation between controlled and

autonomous regulations and the types of outcomes associated with the different motives are now well accepted (Vansteenkiste, Lens, Elliot, Soenens, & Mouratidis, 2014). Young athletes who have more autonomous reasons to participate in their sport demonstrate higher quality motivation, and they have been found to work harder, have more fun, experience higher well-being, and persist longer in sports (Balaguer et al., 2012; Carpentier & Mageau, 2013; Felton & Jowett, 2015). In contrast, lack of autonomous regulation can lead to drop-out among young athletes (Calvo, Cervello, Jimenez, Iglesias, & Murcia, 2010; Jõesaar, Hein, & Hagger, 2011, 2012; Lemyre, Roberts, & Stray-Gundersen, 2007). Research has indicated that high levels of well-being prevent burnout and foster persistence, and this can in turn lead to better performance (Lemyre, Hall, & Roberts, 2008). An overview of the outcomes associated with the different regulations is presented in Figure 1.

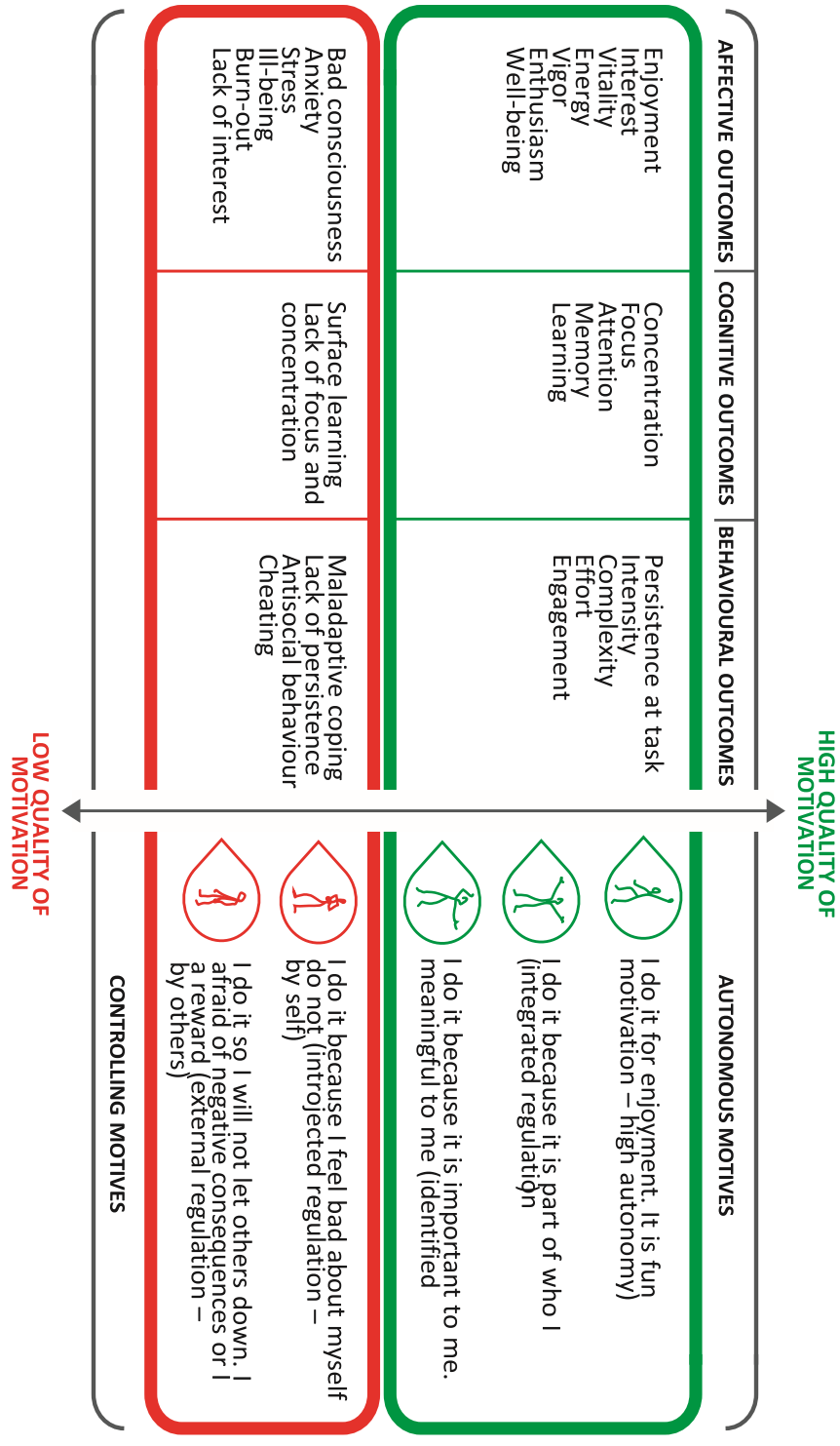


Figure 1 - Outcomes associated with autonomous and controlled functioning

Figure 1: *Outcomes associated with autonomous and controlled motivation*. Outcomes associated with autonomous motivation: General adaptive outcomes (Vallerand, 1997, 2007; Vallerand, Pelletier, & Koestner, 2008; Vansteenkiste & Ryan, 2013), positive affect and healthy personality (Deci & Ryan, 1985, 2002; Ryan & Frederick, 1997), improved performance (Lemyre et al., 2008), persistence in sports (Balaguer et al., 2012; Carpentier & Mageau, 2013; Felton & Jowett, 2015), cognitive outcomes of concentration, attention and learning (Ryan & Deci, 2013; Ryan & Deci, 2017). Outcomes associated with controlled motivation: General negative outcomes (Vallerand, 1997, 2007; Vallerand et al., 2008; Vansteenkiste & Ryan, 2013), negative affective states, such as feeling frustrated, tense, pressured, or controlled (Deci & Ryan, 1985, 2002; Ryan & Frederick, 1997), drop-out among young athletes (Calvo et al., 2010; Jõesaar et al., 2011, 2012; Lemyre et al., 2007), cognitive outcomes, lack of focus and concentration (Ryan & Deci, 2013; Ryan & Deci, 2017)].

The quality of athletes' motivation matters, thus an understanding of how to facilitate this motivation is our next step towards understanding how to develop the learning material.

Basic Psychological Needs

The assumption that all humans have three basic psychological needs for *autonomy*, *competence*, and *relatedness* (Ryan & Deci, 2017) plays a crucial role in understanding how to facilitate optimal training contexts. The Basic Psychological Needs Theory (BPNT), the fourth of SDT's mini theories, explains why these basic psychological needs are the energizing force in SDT. Autonomy concerns the extent to which people experience their behaviour to be volitional or self-endorsed (Ryan & Deci, 2017). Being autonomous is not equated to making choices (Soenens, Vansteenkiste, & Sierens, 2009). An athlete can feel autonomous in the absence of choice, when he or she endorses his or her coaches' mandated activity because he or she agrees with it. When feeling ownership of one's own actions, the need for autonomy is satisfied and the athletes' resources, interest, and capacities are invested in the action. The opposite of self-endorsement is feeling coerced, compelled, or seduced to act by forces external to self (Ryan & Deci, 2017).

Hedda feeling autonomous through ownership of the process, taking the initiative to skateboard to work on the pumping technique, with the rational that this technique also is important for pumping in the slalom course. Photo credit: Frode Klevstul

To feel competent, the athletes' actions must be perceived as self-organized or initiated, in other words, they feel a sense of ownership of the activities that they succeed in (Deci & Ryan, 1985). When feeling that one masters the drills and exercises in practices, and the goals are self-set, the competence need is satisfied.

Norwegian national skicross team athletes feeling competent when they master the drills and exercises in practice–as demonstrated in this Wu-tang (name of this type of element). Marte Gjefsen, Hedda, and Julie Jensen. Photo credit: Einar Witteveen

The need for relatedness is the need to perceive that others care for us unconditionally (Ryan & Deci, 2017). To belong, be significant, and matter in the eyes of others is a primary goal of human behaviour. When athletes feel part of their sport's social group and have a sense of belonging with their peers or coaches, the need for relatedness is satisfied and the athlete experiences need satisfaction.

Relatedness satisfaction: Athletes on the Norwegian skicross team having fun together. Photo credit: Hedda Berntsen.

Interpersonal styles

Whether a motivational context is optimal or harmful for young athletes is determined by the degree of perceives basic psychological need-support or thwarting (Bartholomew, Ntoumanis, Ryan, Bosch, & Thogersen-Ntoumani, 2011; Deci & Ryan, 2012; Vansteenkiste & Ryan, 2013). Social contexts that are perceived as predominantly need-supportive lead to need-satisfaction, facilitate natural growth processes, including autonomous motivated behaviour and well-being (Deci & Ryan, 2000; Vansteenkiste & Ryan, 2013). The complete SDT causal sequence exemplifies SDT concepts as seen in the model (Fortier, Duda, Guerin, & Teixeira, 2012; Grouzet, Vallerand, Thill, & Provencher, 2004; Vallerand, 1997; Vallerand, Fortier, & Guay, 1997; Vallerand & Losier, 1999). Coaches can foster autonomous motivation if they act in a need-supportive manner or undermine it if they use a controlling style towards their athletes (Chatzisarantis & Hagger, 2007).

Coaches can foster athletes' autonomous motivation through their *interpersonal style* when athletes perceive their needs to be satisfied (BPNT; Ryan & Deci, 2017). The coach's interpersonal style reflects the strategies he or she usually adopts when interacting with his/her athletes. As need-support is defined as autonomy-support accompanied by structure

and interpersonal involvement (Mageau & Vallerand, 2003; Matosic et al., 2016; Rocchi, Pelletier, & Desmarais, 2017; Taylor & Ntoumanis, 2007). The coach, as an important authority figure, should combine all three aspects of need-support. Autonomy support (requiring the person to take others' perspective in consideration, acknowledge others' feelings, promote choice and decision-making, and offer a meaningful rational whilst minimizing external demands) accompanied by structure (there are rules) and involvement ("I care about my athlete") makes up a need-supportive style (Mageau & Vallerand, 2003).

The absence of need-supportive behaviours does not automatically imply the presence of thwarting behaviours (Sheldon, 2011). An interpersonal style that actively thwarts athletes' needs can be considered controlling (Bartholomew et al., 2011). A need-supportive style is preferable over a controlling interpersonal style, which may actively thwart athletes' needs (Bartholomew et al., 2011). The concepts of controlling style and need-supportive style are orthogonal (Matosic & Cox, 2014; Soenens et al., 2009). Initial empirical evidence indicates that coaches often use a combination of the behaviours from these two interpersonal styles (Matosic et al., 2016), but the essence is that the the interpersonal style allowes athletes to have autonomous motivation, in particular *identified motivation* (Deci & Ryan, 2000), which is needed to reach goals. Identified motivation is essential to developing one's potential and willingness to take on tasks that may not be enjoyable, such as repetitive and demanding drills. In contrast, controlling behaviours are need undermining and include chaos (vs structure), hostility (vs warmth), and coercion (vs autonomy-supportive) (Skinner & Edge, 2002).

Determinants of coaches' interpersonal styles

Despite knowledge about and attempts to foster need-supportive coaching, there are determinants that influence coaches' interpersonal style: the coaching context, perception of athletes' behaviour and motivation, and coaches' personal orientation (Mageau & Vallerand, 2003). First, pressure from above is the pressure coaches feel to perform—this can determine how they act (Mageau & Vallerand, 2003; Pelletier, Séguin-Lévesque, & Legault, 2002). Secondly, if coaches perceive their athletes to be lazy and lacking incentives and engagement, they tend to pressure these athletes and downplay the motivation they wish to see (Mageau & Vallerand, 2003; Rocchi, Pelletier, & Couture, 2013). Thirdly, coaches' beliefs about what good coaching is influences how they behave toward their athletes (Mageau & Vallerand, 2003).

It is not very helpful to know what good coaching is if one does not know how to *do* it. Thus, an investigation into how coaches learn is of outmost importance.

Leaning dimensions - the holistic approach to learning

There are different ways to understand learning and thus inform the practice of coach learning (Cushion, 2011). There are three main types of learning theories (i.e. behaviourism, cognitivism, and social/constructivism) (Cushion, 2011). Each of these theories tries to capture parts of the whole as no one coaching approach fits all learning situations (Jarvis & Parker, 2006). Jarvis proposes that learning is the process of becoming as a result of doing, thinking, and feeling and needs to be holistic (Jarvis, 2004, 2005), thus the holistic approach to learning sees coaching as a complex social process. A major concern about the effectiveness of coach education has been the transfer of theoretical knowledge to practical skills (Morgan, Jones, Gilbourne, & Llewellyn, 2013). The Western dichotomizing of knowledge dates all the way back to Aristotle. More than 2000 year ago, he distinguished practical (techne and phronesis) from theoretical knowledge (episte) (Ackrill, Urmson, & Ross, 1998). This dichotomization has continued throughout the 19th century. This has been a constant debate. For example, McDougall (1923) distinguished between explicit recognition and implicit recognition, Tolman (1949) proposes that there are more than one way of knowing, Ryle (1984) introduced "knowing that" and "knowing how," Bruner (1969) separated memory with record form memory without record, and Winograd (1975) introduced declarative and procedural knowledge. On one side, we have theoretical knowledge, on the other practical. This mirrors the distinction between theory and practice that seems problematic in relation to skill acquisition in sport.

The theoretical dimension: The cognitive theory of multimedia learning

Given the lack of detailed guidelines from the coach education literature on how to design learning materials for coach learning, we turned to the science of learning and the cognitive theory of multimedia learning (Mayer, 2003, 2009). This is one of the most developed research-based theories on how people learn from words and pictures (Mayer, 2009). The cognitive theory of multimedia learning is based on the assumption that people learn from a combination of words and pictures and uses information-processing to explain how people learn (Mayer, 2009). Engagement and design are crucial for learners to reach the

meaningful learning stage – when coaches understand what need-support means for them in their practice. A detailed description of the design process is presented in Article 1.

The practical dimension

There are theories that explain the transcendence between "knowing that" and "knowing-how" (i.e.: Mesterlære, (Nielsen & Kvale, 1999), situated learning (Lave & Wenger, 1991), the three-level model of professional learning (Korthagen, 2010), the five-stage model of the mental activities involved in directed skill acquisition (Dreyfus & Dreyfus, 1980). Out of all of these dynamic models of human expertise, Dreyfus and Dreyfus' skill-acquisition model is especially fruitful because we are concerned with the development of need-supportive skills in coaches.

The Dreyfus model introduced five different stages of learning in skill acquisition (Dreyfus & Dreyfus, 1980). A person usually passes through five qualitatively different stages of their mode of decision making as their skills improve through instruction and experience. For example, a coach at a higher stage of his leaning process will perform the skill better than a coach at a lower stage of the learning process. At level 1-3, the coach knows what need-support is, and also wants to act need-supportively, but this does not mean that the coach knows *how* to act need-supportive towards his or her athletes in the heat of the moment of a challenging situation where two athletes are yelling at each other. Reaching the last two stages of the Dreyfus model requires moving from analytical decision making to implicit decision making. To reach the expert level of need-supportive coaching, the skill must be practiced extensively in the sport specific context. The upper level coach does not go from athlete to athlete in a pre-set sequence, rather she or he continually evaluates the athletes' need for attention, feedback, support, rationales or opportunities for initiative taking and arrange his/her coaching accordingly. The coach behaviour "flows" at this level and he or she becomes better adapted to the concrete situation. The core expertise at the expert level is the judgement the coach so effortlessly makes. Dreyfus and Dreyfus suggest that intuitive decision making is not based on the same rule-based decisions of lower level skills (Dreyfus & Dreyfus, 1986). Thus, the Dreyfus and Dreyfus skill acquisition model challenges the cognitivist view of learning (viewed as an individual process) by acknowledging the importance of the interplay between the learner and the context for the learning process (Flyvbjerg, 2001).

Meaningful learning and reflection – the missing link?

In order for coaches to act need-supportively, they need to know *how* to prepare for trainings on the hill, *how* to respond in context specific situations that do not allow for the same kind of rule-based conscious decision-making. In other words, it requires more than knowing-that, articulated knowledge or the theoretical understanding of why need-support is important. The meaningful learning (Mayer, 2009) dimension is the dimension between theory and practice where the theoretical makes sense in light of the practical element. The expert coach knows what to do based on his/her mature and practiced understanding. Reflective learning and relevancy through reflection has been suggested to play an important role in continued developing coaching expertise (Jones, Morgan, & Harris, 2012; Knowles, Borrie, & Telfer, 2005; Moon, 2004). The holistic view of the situation is of great importance for the coach at the expert level. When discussing the development of human expertise, an operationalization is needed that includes:

- the theoretical dimension;
- meaningful dimension; and
- the practical (execution) dimension.

The research questions

Based on the self-determination theory framework, as outlined above, two overarching and five minor research questions are presented as the starting point for this investigation to add understanding to the current state of knowledge of what need-support look like in terms of behaviours and how to develop and implement a coach development program aiming to teach coaches need-supportive coaching strategies:

Overarching research question:

1. How can researchers design a coach development program that aims to enhance coach learning?
2. How does coach need-supportiveness influence athlete sport experience (well-being and motivation)?

More specific research questions:

1a) What is coaches' assessment of the educational value of the digital workbook for coach development?

1b) How are coaches using the need-supportive coaching strategies presented to them in MAPS, in their actual coaching practice?

1c) What is the change in athletes' perceptions of coach need-supportiveness throughout an academic year?

2a) What is the within-person relationship between need-supportiveness and vitality?

2b) How does the fit between coach and athlete aims for their sports participation influence the athletes' endorsement of coaches' behaviours, structure, and rules?

Research hypothesis

2 c) Perceptions of competence-support, autonomy-support and relatedness-support from coach has a credible positive within-person relationship with subjective vitality?

THE INTERVENTION

Hedda's story: "In the process of planning MAPS, I studied other interventions. Few seemed to be informed by theories of learning. Coming from pedagogy, I recognize the important of planning learning. Simply knowing what kind of interpersonal style is optimal for athlete well-being and motivation is not enough; we need to plan for coach learning so coaches know how to act need-supportive."

Using theory to improve practice has proven difficult in the field of coach development, and coaches' engagement with the real world may need to be better monitored, understood, and evaluated to improve coaching expertise (Culver & Trudel, 2006; Nelson & Cushion, 2006). However, before we can expect coaches to change and become more effective by attending a coach development program, we need to understand how we can successfully produce that change (Allan, Vierimaa, Gainforth, & Côté, 2017). One way to achieve such a behavioural change is through applying theories of learning (Trudel, Gilbert, & Werthner, 2010).

Coach Development Programs (CDP)

There are numerous prescriptions for coach learning, yet evidence of coach learning through attending programs is limited (Cushion & Nelson, 2013). Moreover, there is little scientific evidence that CDPs actually have a long-term impact on coaching practice (Trudel et al., 2010). CDPs typically play a marginal role in coach learning compared to learning from experience (Trudel et al., 2010). Naturally, this is more closely related to the time spent on coaching and interacting with athletes, than in coach education programs (Erickson, Côté, & Fraser-Thomas, 2007; Gilbert, Côté, & Mallett, 2006). Thus, a central issue in the field of sport coaching education is increasing the effectiveness of coaching strategies through CDPs (Evans, McGuckin, Gainforth, Bruner, & Côté, 2015; Lefebvre, Evans, Turnnidge, Gainforth, & Côté, 2016).

Researchers argue that coach development programs (CDP) have the potential to change coaches' interpersonal, intrapersonal, and professional behaviours through education, social interaction, or personal reflection when learning activities are systematically applied (e.g., Evans et al., 2015; Lefebvre et al., 2016; Smith, Smoll, & Cumming, 2007). Yet, research shows that few CDPs and coach education interventions lead to coach learning (Allan et al., 2017; Langan, Blake, & Lonsdale, 2013), which means that they are desperately in need of improvement. However, before entering that discussion I will offer some suggestions as to why CDPs fail.

1. *Interpersonal and intrapersonal coach knowledge underrepresented*

Lefebvre and colleagues (2016) classified CDPs into three main categories. The majority of the 285 CDPs focused on coaches' professional knowledge (sport specific) development such as technical and tactical skills. Only 18 programs focused on coaches'

interpersonal knowledge (relation-building skills), while six programs focused on coaches' intrapersonal knowledge (capacity to intersect and reflect), which means that both areas are underrepresented in the field of coach education. Turnidge and Côté (2017) suggest integrating interpersonal theories into coach education both to explore the interpersonal dimension of the coach-athlete interactions and to design effective, interpersonally-focused CDPs.

2. *Few need-supportive youth coaching programs*

Research and reviews have suggested that coach behaviour has important motivational implications for their athletes (Amorose, 2007; Amorose & Anderson-Butcher, 2007; Mageau & Vallerand, 2003). Mageau and Vallerand's motivational model (2003) has been a popular theoretical framework on the importance of adaptive outcomes (Occhino, Mallett, Rynne, & Carlisle, 2014). This model is based on the assumption that n autonomy-supportive coaching style can contribute to need-satisfaction and self-determined motivation, which in turn lead to positive athlete outcomes. The seven autonomy-supportive strategies presented by Mageau and Vallerand are key to a need-supportive environment.

3. *The importance of theory based CDPs*

Several reviews have concluded that there is a need for CDPs that are grounded in behavioural change theories (Allan et al., 2017; Evans et al., 2015; Lefebvre et al., 2016). Yes, little is known about the theoretical foundation and techniques used to design and implement effective CDPs (Allan et al., 2017). In a review of CDPs only one fifth (only six CDPs) of the programs were based on behavioural change theories (Allan et al., 2017). Interestingly, no single theory was used to inform CDPs more than once.

4. *Lack of focus on developing interventions for coaches' behaviour change*

Despite rigorous empirical testing of SDT (Ryan & Deci, 2017), the effectiveness of the application of autonomy-supportive behaviours is unknown in the context of coach education (Vella & Perlman, 2014). Yet we know that people can learn to be supportive, a finding that is supported by a review of intervention studies aiming to develop autonomy-support in other domains (Su & Reeve, 2011). Much of the research in autonomy-supportive coaching has focused on the impact of coaching behaviours on athlete outcomes (e.g., Amorose & Anderson-Butcher, 2007; Carpentier & Mageau, 2013; Gagné, Ryan, & Bargmann, 2003; Occhino et al., 2014) rather than on developing coaching interventions and

coaches' behaviour change (Amorose, 2007). One exception is an intervention for swimming coaches (Pelletier, Fortier, Vallerand, & Briere, 2001).

Underlying pedagogy of MAPS

Paramount for successful learning is the underlying pedagogy (i.e., how the learning material contributes to the learning process) (Govindasamy, 2001). MAPS is informed by a holistic view of learning. Shown in figure 2 are the different learning activities and tools inform different parts of the learning process: factors that influence learning (i.e., learning situations, context, and learner biographies/cognitive structures) and, as shown in the horizontal column of Figure 2 different learning dimensions (i.e., practical, meaningful learning, and theoretical). Figure 2 is further building on Mayer (2009) and Jones and colleagues (2012) non-linear process of coach development where theory and practice are intertwined through reflection. Reflection is illustrated through "thinking bridges" in our proposed coach learning process model for MAPS (see Figure 2). The *theoretical* dimension is the "knowing-that," including knowing *why* to act need-supportive, and what constitutes good coaching. The *practical* dimension is knowing *how* to act, which is difficult to articulate. We propose the *meaningful leaning* dimension as the *nexus* between the theoretical and practical dimension as the coaches relate practical experience and theoretical knowledge and understand how they connect; or not (Mayer, 2009, 2010). Meaningful learning is not behavioural change *per se*, however, it is important for behavioural change, and thus referred to as a *nexus* between the theoretical and practical dimensions of coach learning. This is an important distinction, as we will investigate the coaches learning process in relation to the different stages of Figure 2.

It has been suggested that the learning process needs both experience and reflection to understand what theoretical constructs mean in practice (Knowles et al., 2005; Moon, 2004). Engagement is important for active processing to reach the meaningful learning stage (Mayer, 2009). Engagement is also important for reflective learning (Jones et al., 2012; Knowles et al., 2005; Moon, 2004). Coaches' engagement and reflection (internal learning situation) are essential for a meaningful learning process, and this is reflected in the two thinking bridges in Figure 2. The bridges illustrate that the thinking process goes back and forth between the meaningful learning dimension and the theoretical and practical dimensions, and they illustrate the notion that learning is not a linear process (Jones et al., 2012).

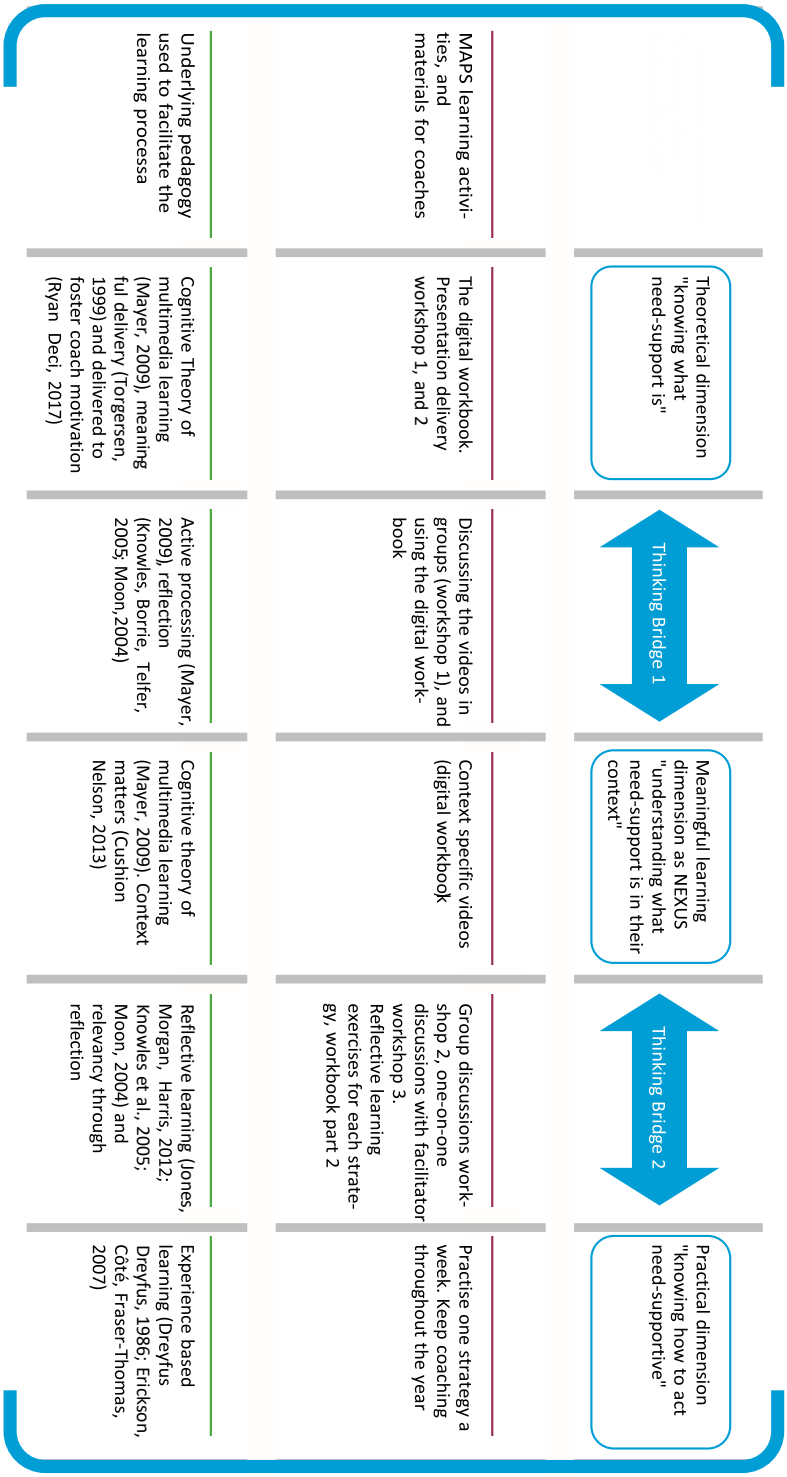


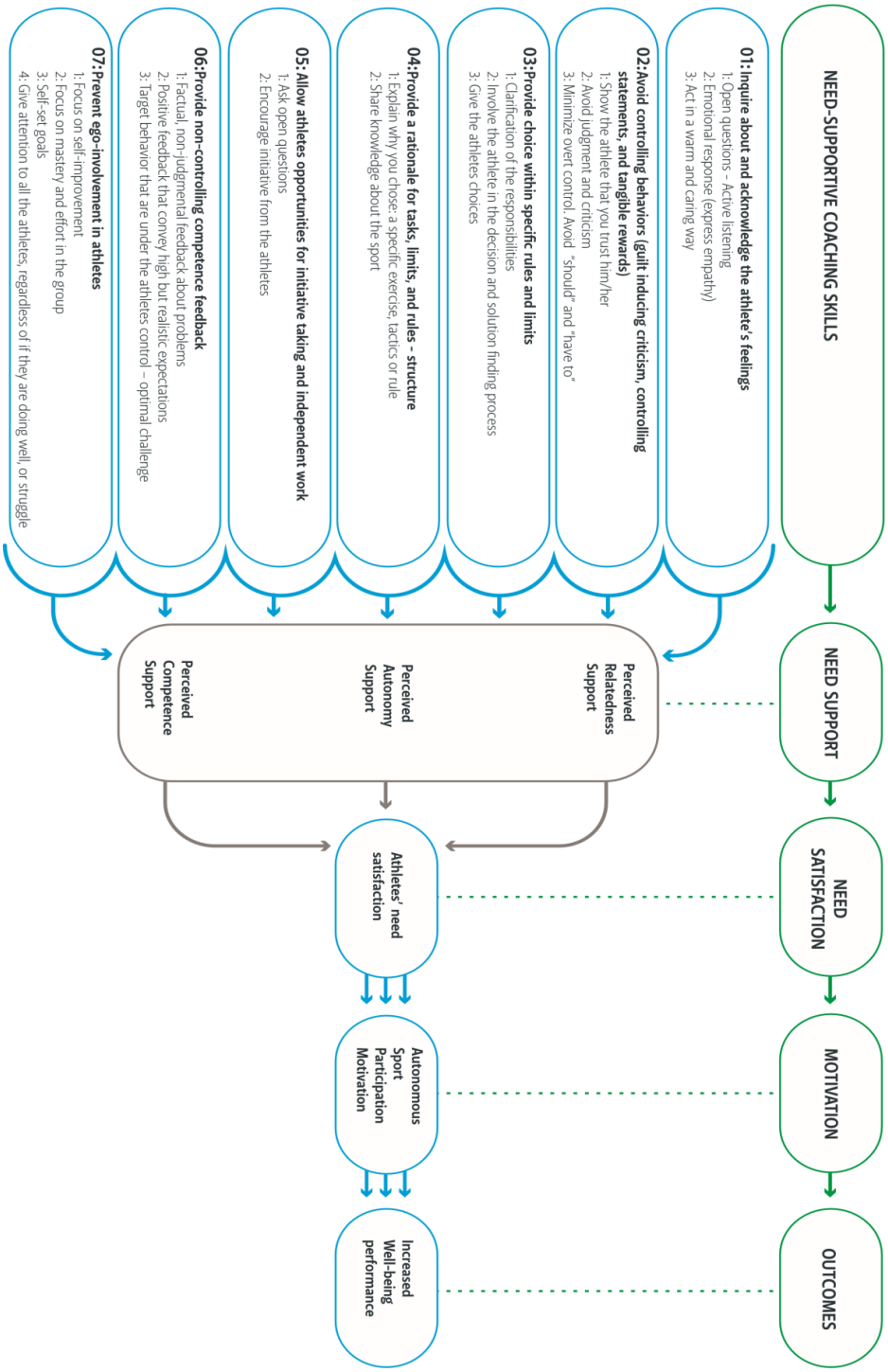
Figure 2. The learning process and pedagogical principles informing the motivation activation program in sports (MAPS)

MAPS content – the explicit need-supportive skills

> *Hedda's story: "When I was developing learning material for NSF in 2011, I found that the scientific articles and book chapters did not really explain "how" to act need supportive. I was at a loss when it came to explaining how to act need-supportive. The constructs (i.e., autonomy-supportive strategies, competence-supportive strategies, relatedness-supportive strategies) were explained in a theoretical manner (i.e., support your athletes' autonomy!). Yet I quickly realized that explaining the theory was not enough, I need to explain and show how to act need-supportive."*

Theoretical constructs were translated to develop this CDP. We wanted to translate theoretical constructs into actual behaviours and to present a set of skills that could show coaches "how" to be need-supportive. The explicit need-supportive coaching behaviours were developed through an extension of Mageau and Vallerand's (2003) seven autonomy-supportive strategies. We incorporated an explicit focus on support for competence (structure) and relatedness (interpersonal involvement) by adding *explicit coaching skills* for each of the original seven strategies. Structure is explained as the extent to which the coach allows her or his athletes to feel competent (Mageau & Vallerand, 2003). Coaches can, through their instructions and structure, and, based on their knowledge, be essential to athlete progress and perception of competence. Involvement is explained as the extent to which the coach allows athletes to connect with others (Mageau & Vallerand, 2003). Structure and involvement instilled by the coach are important determinants of athletes' perceptions of competence and relatedness in addition to existing autonomy-supportive behaviours and their multiple needs-effects (Mageau & Vallerand, 2003; Matosic et al., 2016; Ntoumanis, 2012).

The seven autonomy-supportive coaching strategies presented by Mageau and Vallerand (2003) represent the basis of this intervention. They are as follows: (1) Provide as much choice as possible within specific limits and rules. (2) Provide a rationale for tasks, limits, and rules. (3) Inquire about and acknowledge others' feeling. (4) Allow opportunities to take initiatives and do independent work. (5) Provide non-controlling competence feedback. (6) Avoid overt control, guilt inducing criticisms, controlling statements and tangible rewards. (7) Prevent ego-involvement from taking place (see Figure 3).



Figur 3 – SDT process model of coach need-supportive behaviours on sport participation motivation and well-being

[Figure 3. References *SDT process model of coach need-supportive behaviours influence on sport participation motivation and well-being*: The seven need-supportive strategies: (Mageau & Vallerand, 2003), SDT causal sequence: (Fortier et al., 2012; Grouzet et al., 2004; Vallerand, 1997; Vallerand et al., 1997; Vallerand & Losier, 1999); Vallerand, Fortier, & Guay, 1997; Vallerand & Losier, 1999). The explicit skills: (1): (Mageau & Vallerand, 2003; Skinner & Edge, 2002; Sparks, Dimmock, Whipp, Lonsdale, & Jackson, 2015; Tessier, Sarrazin, & Ntoumanis, 2010). (2): (Mageau & Vallerand, 2003; Reeve, Deci, & Ryan, 2004; Reeve, Jang, Carrell, Jeon, & Barch, 2004; Skinner & Edge, 2002; Tessier et al., 2010). (3). (Amorose, 2007; Amorose & Anderson-Butcher, 2007; Mageau & Vallerand, 2003; Matosic & Cox, 2014; Matosic et al., 2016; Standage, Gillison, & Treasure, 2007; Taylor & Ntoumanis, 2007). (4). (Jang, Reeve, & Deci, 2010; Mageau & Vallerand, 2003; Matosic et al., 2016). (5). (Amorose, 2007; Mageau & Vallerand, 2003; Stone, Deci, & Ryan, 2009). (6). (Amorose, 2007; Carpentier & Mageau, 2013; Deci & Ryan, 2000; Jang et al., 2010; Mageau & Vallerand, 2003; Matosic et al., 2016; Ryan & Deci, 2017; Tessier et al., 2010). (7). (Mageau & Vallerand, 2003; Matosic et al., 2016; Skinner & Edge, 2002; Taylor & Ntoumanis, 2007; Tessier et al., 2010)]

To illustrate the importance of the explicit coaching skills the following example is offered. "Prevent ego-involvement in athletes" is one of the original seven autonomy-supportive strategies proposed by Mageau and Vallerand (2003). This strategy can be quite hard to transfer into actual coach behaviours for any coach. To know how to prevent ego-involvement in athletes, one first needs to know what ego-involvement means. To focus on self-improvement, emphasize effort and mastery in the group, use self-set goals for the athletes, attend to all athletes, regardless of if they are doing well or struggling was added for this coaching skill. These explicit skills are examples of *how* to prevent ego-involvement. More explicit explanations of need-supportive behaviours have been requested (Conroy & Coatsworth, 2007). The proposed explicit coaching skills were drawn from SDT research reports and SDT-based interventions (see Article 2 for full referencing).

The digital workbook

Based on my literature review and principles of the cognitive theory of multimedia learning, I developed a digital workbook (see Appendix VIII). The digital workbook was divided into three main parts. Benefits of a need-supportive coaching style were outlined, and key concepts explained through text with tables, graphics, and pictures in part one of the coaches' workbook. Part two of the workbook contains the videos and exercises for each of the need-supportive coaching strategies. In part three, personal, contextual, and social influences on coach behaviours were presented. We hired a graphic designer to do the layout for the digital workbook. The models and tables were developed in close collaboration between the researchers and the designer. Two additional researchers as well as non-academic coaches read though the workbook and offered feedback, based on which I further improved the workbook.

Based on need-supportive coaching skills and knowledge about the coaching context and sport, a manuscript was written, acted out, filmed, and edited into seven videos. The seven videos in part two, started out with a description of a need-supportive coaching strategy and a sport specific scenario is described by a voice-over, as we see athletes practicing while music is playing in the background. Next, a dialogue between a coach and an athlete or a monologue by the coach took place. The coach behaviour in each scenario is shown in a need-supportive way ("good coach") as well as a controlling way ("bad coach"). The videos end with a reflection by one of the athletes of how it felt to be treated in a need-supportive versus a controlling style. The goal for the videos was to demonstrate the difference between a controlling coach and a need-supportive coach.

Expert knowledge about the context of youth sports (especially skiing) was very helpful when working on the video scripts, hence, an understanding of the sport specific context was needed in order to write a script that would be familiar for coaches.

I spent a week in a ski resort working with a group of elite skiers and their coaches. The athletes and the coaches were given the manuscript and asked to act out the different roles and contexts. I (as the director of the videoes) explained, instructed, and talked with the "actors" as they acted out the scenarios. As a perceived sense of being controlled depends also on non-verbal factors, the scripts were acted out. Tone of voice and non-verbal expressions were also essential to achieve a clear distinction between the two different coaching styles. I worked closely with the editor when editing the video and when recording the voice-overs

The seven videos

1. **Inquire about and acknowledge the athlete's feelings (relatedness)**

a) Open questions and active listening;
b) Emotional response (express empathy); and
c) Act in a warm and caring way.

Voice over: One athlete approaches his coach with something on his mind. The way the coach responds influences his feeling of involvement.

2. **Avoid controlling behaviours (guilt inducing criticism, controlling statements and tangible rewards) (relatedness, autonomy)**

a) Show the athlete that you trust him/her, give responsibilities;
b) Avoid judgment and criticism; and

c) Minimize overt control. Avoid "should" and "have to" (instead us "you could try," "may").

Voice over: It is the last practice before spring break. How the coach talks to the athletes shows them whether he trust them.

3. Provide choice within specific rules and limits (autonomy)

a) Clarify responsibilities;
b) Involve the athlete in the decision and solution finding process (trust); and
c) Give the athletes choices.

Voice over: It is team meeting, and the plan is handed out. The planning process influences the athletes' feeling of involvement in their career. Now, we will witness two different approaches.

4. Provide a rationale for tasks, limits and rules – structure (autonomy and competence)

a) Explain why you chose a specific exercise, tactics or rule; and
b) Share knowledge about the sport.

Voice over: The athletes are getting ready for a tough weight lifting session. How well the reason for this session is explained, influences the athletes' understanding of the importance of the session.

5. Allow athletes opportunities for initiative taking and independent work (autonomy)

a) Ask open questions; and
b) Encourage initiative.

Voice over: An athlete shows initiative in his developmental process. How the coach responds to this initiative influences his sense of ownership.

6. Provide non-controlling competence feedback (competence)

a) Offer factual, non-judgmental feedback about problems;

b) Offer positive feedback (informational) that convey high but realistic expectations; and
c) Target behaviours that are under the athletes' control – optimal challenge.

Voice over: It is ski practice. One of the athletes had a bad run on the slope style course. Nothing worked out. The athlete approaches the coach for feedback. How the coach gives feedback influences the athlete's perception of competence.

7. Prevent ego-involvement in athletes (competence)

a) Focus on self-improvement;
b) Focus on mastery and effort in the group;
c) Allow for self-set goals; and
d) Attend to everyone, regardless of if they are doing well or struggle.

Voice over: It's competition day. As all teams, some athletes get highly ranked while others get poorly ranked. The ability of the coach to focus on every athlete's personal development and effort influences athletes' perception of competence.

A full example: Strategy 6

Good Coach (C)

Athlete (A)

A: Hi

C: How did it go?

A: It went really bad. I think I was leaning back in my boots and lost my balance.

C: Ok, what do you think you need to do differently next run?

A: I don't really know what to do.

C: All right, the important thing is that you lean more forward in your boots because if you stay back, the centre of gravity is back when you leave the jump. So, it is important that you try to push forward against the front of your boots, and then you can push of as you leave the jump.

A: Yes

C: Then you will stay balanced in the air.

A: Yes

C: Good

Athlete reflection:

A: I really like it when my coaches are honest with me and tell me what I did wrong, but it is important that they also tell me what I need to do better, so that I can improve the run I am trying to make. It helps my motivation when the coach can point out what I do not manage to do yet, so I have room for improvement.

Bad Coach (BC)

BC: Shit, this is not worth it for me Tora. We have travelled for seven fuckings hours to get up here, and you have practices all day and you still jump like a scarecrow, you are hanging in your boots and fly like a girl, get back up there and try again, this is pointless. Ski more.

Athlete reflection:

A: I do not like it when the coaches say mean things to me and fail to give me feedback on what I can do to improve, but just tell me how bad I jump. Asking me to do it again without telling me what I can focus on. It makes me feel defeted.

METHODOLOGY

Hedda's story: "Using surveys to capture behaviours seems to be a common method of data collection. As an elite athlete, we were asked to answer questionnaires on several occasions. I always felt the need to explain that checking of pre-made questions does not explain the whole picture. When preparing this research project, I wondered how four items could capture autonomy-support, competence-support or relatedness-support. Maybe there is a better way to make sure the coaches and athletes are talking about the same behaviours we wish to investigate?"

Qualitative and quantitative methods were chosen to answer the research questions in the different phases of this research project. In recent sport psychology investigations, mixed-methods studies (MMR: Johnson, Onwuegbuzie, & Turner, 2007) have gained acceptance as a methodology that can offer a more nuanced understanding of a phenomenon (Partington & Cushion, 2013). The possible gains of MMR in evaluation research is increased validity, more comprehensiveness to findings, more insightful understanding, and better ability to include diversity. Through reflexivity and responsiveness, MMR promise increased understanding of social programs, which in turn can improve coach practices (Greene, Benjamin, & Goodyear, 2001).

One of the critiques of this type of design has traditionally been the potential clash of epistemological and ontological positionings (Greene et al., 2001). One philosophical stance that allows for a mix of methods and avoid the clash between realists and constructionist is Bhaskar's *critical realism* (Bhaskar, 2013). This stance has emerged as one of the most powerful directions in philosophy of science, offering a good alternative to positivism and constructivism (Patton, 2005). It merges classical realistic ontology with an interpretive epistemology. Critical realism acknowledges that the world exist independently of our perceptions of it, thus admits that our understanding of the world is constructed and coloured by our subjective perspectives (Maxwell & Mittapalli, 2010). This stance allows for a healthy scepticism toward the data. When interviewing the athletes for example, I was aware of their power relation to their coaches as well as me, and I was aware that they might have tried to impress me.

	Paper 1	**Paper 2**	**Paper 3**	**Paper 4**
Co-authors	Kristiansen	Kristiansen	Ivarsson Kristiansen	Kristiansen
Journal	International Journal of Sports Science and Coaching	International Sport Coaching Journal	Motivation and Emotion	Sport Coaching Review
Date of acceptance	February 14th, 2019	November, 2018		September 1st, 2018
Sample	N=10	N=10	N=102	Athletes: N=11 Coaches: N=10
Age	Coaches: 29-54 (M=36,4)	Coaches: 29-54 (M=36,4)	Athletes: 16-18	Athletes: 16-18 Coaches: 29-54 (M=36,4)
Interviews	10	10		A: 3, C: 10
Number of surveys			3	
Quantitative	NO	NO	YES	NO
Qualitative	YES	YES	NO	YES
Design	Cross-sectional	Cross-sectional	Experimental (i.e., to manipulate coaches), Temporal longitudinal (i.e., to assess athlete measures)	Cross-sectional
Research strategy	Semi-structured interviews	Semi-structured interviews	Survey research	Semi-structured interviews, focus group interviews
Analysis	Thematic analysis	Thematic analysis	Bayesian	Thematic analysis
Major theme	Assessment of learning material	Coaches learning experiences	Teaching need-support and the role of perceptions of each need on athlete well-being	Perceptions of need-support. Coach-athlete interactions.

Table 1 - Overview of method, participants and focus

The present study was executed in one of the approximately 34 elite sport schools in Norway. The non-profit private foundation *The Norwegian College of Elite Sport* (hereafter NTG) is a network of elite sport schools in Norway. NTG currently runs six schools with 990 students participating in 27 different sports (Norges Toppidrettsgymnas, 2018). Current and former NTG athletes have achieved considerable success, accumulating 175 world championship medals, and 64 Olympic medals (Norges Toppidrettsgymnas, 2018). Arguably, NTG is a stepping-stone for national teams and professional sports.

The NTG coaches

Ten coaches 25-54 years (Male=9, Female=1, M age=36.4, SD= 9.167) at NTG participated in the two-month long intervention. The coaches' working experiences ranged from no prior full-time coach experience to true veterans with over 10-years of experience at NTG (M = 5.4, SD =4.35).

The NTG athletes

The total sample consisted of 102 winter sport athletes (male n=70, female n=32, 15-19 years of age, M age= 17.04, SD= 0.866). The athletes represented five winter sports: freeskiing (n=5), snowboarding (n=12), alpine skiing (n=17), cross-country (n=31) and biathlon (n=34).

Of the total sample, 11 athletes aged 16-18 years participated in the video-based interviews evaluating the intervention. They were organized into three focus groups according to sports (alpine n=2, biathlon and cross-country skiing n=4, freeski and snowboarding n=4). A typical focus group has six to 10 members, though smaller groups are suggested when the topic is complex and or emotionally difficult (Morgan & Scannell, 1998). Furthermore, the number of focus groups pays importance to the researchers needs (Bryman, 2015), and it was seen preferable that athletes from the same or similar sports were grouped together.

Ethical approval

The Norwegian Social Science Data Services was informed about the research project. Informed consent was obtained from coaches, parents, and athletes (age 18 and over) in the beginning of august 2016, before conducting the intervention between August 24th - October 13th, 2016) and follow-up interviews (May 8th-10th, 2017). Parents were informed about the project in a teacher-parent conference. We informed the coaches about the project before the first data collection, as well as their participation rights. We asked the sport director and coaches to invite athletes for participation. Athletes were informed about the project before the first data collection. All the participants were informed that their anonymity would be protected, the confidentiality of the study upheld and their freedom to withdraw from the study at any point in time. No consent was withdrawn. The Norwegian Centre for Research Data (NSD) approved the project prior to the data collection (Appendix I). Athletes and parents (of athletes under the age of 18) granted informed consent for participation in the project.

Procedures

23.08.16	24.08.16		05.10.16		11-13.10.16	30.11.16	08.05.17
T E S T 1	**Workshop 1** Two hours Multimedia multi-presentation	Inde-pendent worktime with the digital workbook	**Workshop 2** Two hours Multimedia presentation and group discussions	Inde-pendent worktime with the digital workbook	**Workshop 3** One-on-one discussions with educator	T E S T 2	T E S T 3

Table 2 - Intervention design

Practical considerations for workshop procedures

Ten coaches at the Norwegian College of Elite Sport participated in the two-month long intervention. MAPS consisted of three workshops taught between August 25th, 2016 and October 13th, 2016. Altogether the three workshops lasted for five hours (see Table 2). All the workshops and presentations were based on the digital workbook, and between the workshops the coaches had time for independent work with the digital workbook. Group discussions in workshop two focused on personality, contextual, and social influences on coach behaviours, which had initially been presented to the coaches in part three of the digital workbook.

An additional aspect of the learning process is the "wanting to learn." Motivational features can improve learning by coaches' engagement (Mayer, 2014). MAPS itself was therefore delivered in a need-supportive way–fostering coach autonomous motivation. Technologies can be essential tools for teaching and learning. Information and Communication Technology (ICT)-pedagogy has developed important insights into how learning materials can be delivered for optimal learning. Based on Torgersen's (1999) multiple formula, any program can deliver meaningful instruction for any targeted audience and in any subject with appropriate facilitation and angulation of the multimedia sequence (Torgersen, 1999). This is possible because of the diversity of the language of sounds and pictures. Facilitation of the learning material enables the implementer to extend the span of information that pass through the different channels (Saeverot & Torgersen, 2016). The power of multimedia presentations lies in the sheer amount of information that can pass through one screen in different forms all at once. How the facilitator uses the digital workbook (learning material), in what context the learning material is presented, and how the learning material is discussed is of importance for the coaches' learning process. Adaptation of the material and form of presentation to individuals' needs is the goal of ICT-pedagogy in order to optimize the

learning outcome. See Table 3 for suggestions (that are in line with ICT-pedagogy) on how to deliver learning material for optimal coach learning (Saeverot & Torgersen, 2016).

How educators can deliver the learning material for maximum impact on coach learning	Examples from MAPS
Make technical opportunities of the learning material accessible.	Accessible digital workbook. Printable, interactive writing in the document, could be copied.
Carefully choose problems that fit the group or individual.	The workbook problems represented typical situations for coaches at a sport school for that specific sport. One-on-one sessions with the educator discussing the problems.
Ask questions to direct the attention to aspects you wish to discuss.	For example, the educator discussed the difference between the supportive and controlling coaching styles with the coaches after showing the videos.
Add information about the scenarios in the videos.	We discussed how information about an athlete in the video could change the message in the video.
Present in a learner-past way.	Coaches could ask questions. We stopped after each video and had group discussion and one-on-one sessions. The learning material was always accessible – so they could go back and read, but also look at the videos and stop them and start them and learn in their own paste.
Use the multi-presentation to differentiate – depending on the context and level.	Coaches attending MAPS could use the learning material to look up the scientific articles and the theories the program was based on. The coaches who did not feel comfortable reading English articles could use the videos to see how to act need-supportive. The digital workbook also allowed for individual tempo.

Table 3 - Delivering the learning material for maximum impact on coach learning

Intervention evaluation coaches

Semi-structured interviews were conducted to understand the nuances of the coaches' experiences with MAPS, as interviews can help us understand the meaningfulness and the implementation of the program (Greene et al., 2001). Before executing the interviews with all the coaches, the interviewer went through Kvale's criteria for high quality interviews and made sure she had done the preparations accordingly (Kvale, 1996). The semi-structured interviews allowed coaches to provide in-depth information (Kvale, 2008) about their experiences with MAPS and the educational material, to what extent they used the digital workbook and what they found challenging. The interviews took place in coaches' offices, except one that took place in the dining hall at a time when there was no one else. The two-way interaction process in the interview setting is the product of the researcher, the participant, and the relationship between them (Finlay, 2002). To create safe settings and

empower the other, communication strategies such as not interfering or expressing own opinions and paraphrasing as part of the role as an active listener were employed (Sparkes & Smith, 2013). The interviews were audio recorded and lasted between 49 and 64 minutes.

When discussing the strategies, the video fractions from the digital workbook were used as basis for the discussion. Photo-elicitation can be used in research as a stimulus for questioning, and it has been suggested that it can help create a meaningful common ground for discussion (Bryman, 2015; Harper, 2002; Pink, 2013)–and in this case stimulate the coaches to remember situations. Each of the seven need-supportive videos were discussed in regard if they used or used not these strategies. Each video was on average two minutes long and prolonged the interviews accordingly.

Intervention evaluation athletes

The athletes had both a quantitative and qualitative evaluation of their perception of coach behaviour and its effect on their well-being and autonomous functioning (only interviews). All the athletes responded to a quantitative survey at three occasions, and they received a short explanation about the research project each time. Next, the athletes were asked to read the questions thoroughly, and ask questions if something was unclear.

In addition to the traditional questionnaires, a qualitative approach was used to supplement evaluation and to gain understanding of coach need-support and athlete experiences. Ten athletes participated in three focus-group interviews. The focus group method was chosen to provide in-depth information about the interaction between the group members and their experiences with their coaches' interpersonal behaviours, and how the members of the groups discuss this issue (Bryman, 2015). A semi-structured interview guide was prepared and used in the focus group method. The interviewer started with an informal talk about their everyday life at ski academy to break the ice, asking them about their sport. The interviewer and athletes viewed the seven need-supportive videos that showed how coaches could act supportive or controlling and discussed them in turn. The athletes were asked to discuss and give examples of how their coach act in relation to what they saw in the videos. To find the balance between guiding the discussion but not being intrusive, the interviewer avoided to interrupt the naturally occurring discussions between group members. It was interesting to notice that some of the athletes elaborated on their examples after listening to their fellow athletes, something that they would not have thought of without the opportunity of hearing the examples of others. The focus-group interviews were scheduled

and conducted at school. After thanking the participants and explaining to them what will happen to the data, I thanked the athletes for their participation. The interviews also ended on an informal note. The interviews were audio recorded and lasted between 55 and 75 minutes.

Measurements

102 elite winter sport athletes filled out a questionnaire package including perception of coaches' interpersonal style and well-being at three time points.

Questionnaire of Basic Psychological Needs Support (QBPNS)

Athletes' perceptions of their coaches' interpersonal need-supportiveness were assessed with the Norwegian version of Questionnaire of Basic Psychological Needs Support (QBPNS) (Sánchez-Oliva, Garcia-Calvo, Sánchez-Miguel, Amado, & Ntoumanis, 2013). The 7-point Likert scale consists of 12 items (1=completely disagree, 4=somewhat agree, 7=completely agree). Athletes were asked to answer 12 different statements following "During practice, my coach....” (e.g., encourages us to do well). In contrast to other scales assessing coach interpersonal styles, the QBPNS takes into consideration all three needs and evaluates athletes' perception of their coach's behaviour in terms of supporting the need for autonomy, competence, and relatedness. This was important for the current investigation, in addition to using a scale to provide insight into situationally induced and changing coach behaviour and the following fluctuations. We assessed need-support, at the state level as stated in the questionnaires, as "over the last few weeks."

Subjective vitality

Athletes' well-being was assessed using the subjective vitality scale (Ryan & Frederick, 1997) with a 7-point Likert scale consisting of seven items (1=not at all true 7=very true). Athletes were asked to what degree the different statements were true for the last seven days (state level) e.g., "I feel alive and vital.” In SDT the definition of well-being goes beyond hedonic outcomes such as happiness and is conceptualized in terms of full functioning (Ryan & Deci, 2017). The rationale behind choosing subjective vitality as an indicator of athlete well-being (wellness) is that vitality is, in SDT, considered to be a state of being fully functioning or thriving (Ryan & Deci, 2017; Ryan & Huta, 2009).

Criteria to ensure rigor in MMR

Several measures were taken for this MMR investigation in order to ensure rigour.

Qualitative research analysis: Articles 1, 2, and 4

Thematic Analysis (TA) allows the researcher to see and make sense of the shared meanings and experiences across a data set such as the conducted athlete and coach-interviews (Braun & Clarke, 2012; Bryman, 2015). This accessible, flexible, and increasingly popular method of analysing data is concerned with the importance of finding the patterns of meaning and link them to the particular research questions.

Member reflection

Further, member reflections (Smith & McGannon, 2018) were used to create high quality, meticulous, and robust research. Member reflections are not done to verify the research but rather to generate additional insight into the process. All articles and quotes were shared with participants. Their comments were welcomed. We received several notes and more reflections on the themes presented. This is in line with the critical realist position since the realist epistemological position acknowledges that we can never know the objective world.

Critical friend

Inter-rater reliability as traditionally used by Lincoln and Guba (1985) has been deemed ineffective in ensuing that the findings are reliable because of philosophical assumptions (Smith & McGannon, 2018). The critical friend strategy is an opportunity for dialogue and to acknowledging multiple truths, perspectives, and results in the research process (MacPhail, Khoza, Abler, & Ranganathan, 2016; Smith & McGannon, 2018).

Transparency

We have offed transparency through detailed records of the research process to enable readers to judge the quality of the final report through their own reflections, scrutiny, and opinions. To determine of the findings can apply to other contexts we discussed the context in detail. We do leave this up to the reader to decide how she or he can use the results and whether they can be transferred to other contexts (Sparkes & Smith, 2013).

Quantitative data analysis

All analyses were estimated using a Bayesian approach. The Bayesian statistical approach and the traditional frequentist approach is based on different statistical assumptions (Stenling, Ivarsson, Johnson, & Lindwall, 2015). The Bayesian approach was chosen as it is better suited of producing reliable estimates with small sample sizes (Song & Lee, 2012). Due to the less restrictive distributional assumptions, the normality assumption does not need to be fulfilled to perform the analyses within the Bayesian approach (Yuan & MacKinnon, 2009). See Article 3 for a full description of the statistical analysis.

BRIEF DESCRIPTION OF THE ARTICLES

Article 1

Successful coach learning: Digital workbook informed by pedagogical principles

Berntsen, H. & Kristiansen, E. (Published March 21st, 2019).

This study was motivated by the hypothesis that advances in cognitive science may be helpful for the design of Coach Development Programs. More precisely, how can a learning tool such as a digital workbook that is informed by evidence based pedagogical principles be helpful? After designing the learning material, based on the cognitive theory of multimedia learning, the digital workbook was used in a coach development program aiming to improve coaches' need-supportiveness. Ten coaches at an elite sport school in Norway attended the program over a season, and afterwards they were asked whether the learning material had contributed to meaningful learning of need-supportive skills. Thematic analysis of the interviews revealed visualization, awareness, and transfer to one's practice as the three main themes describing the educational value of the digital workbook. The pedagogical principles incorporated showed the coaches *how* need-support can be acted out in a sport specific context. Additionally, the learning material resulted in increased engagement and awareness through coaches' reflections, which is an important step towards integrating new material to prior knowledge and create meaningful learning. Finally, the coaches highlighted transfer of the presented learning material to their experiences. In conclusion, cognitive science may have useful implications for the design of effective learning materials for coach development programs.

Article 2

Guidelines for Need-Supportive Coach Development: The Motivation Activation Program in Sport Berntsen, H. & Kristiansen, E. (Published, February 2019).

The purpose of this article was to share the conceptual framework, design, and impact evidence of a coach development program that was aimed at teaching coaches how to act need-supportive toward their athletes. Informed by Self-Determination Theory, the Motivation Activation Program in Sports (MAPS) was developed to contribute a coach interpersonal-style perspective to the Norwegian Ski Federation education system. The program was delivered at the Norwegian College of Elite Sport throughout the 2016/2017 season as a test trial. This article is organized into three sections. First, a detailed description of the conceptual framework used to inform MAPS is offered. Next, a thorough description of MAPS building components is provided. The third section of the article presents impact evidence of coaches' learning experiences together with coaches' practice examples of need-supportive coaching skills. Results reveal that MAPS taught coaches about need-supportive skills at the intrapersonal (awareness of own coaching practice) and interpersonal (interaction with athletes) level. In addition, effective need-support for athletes required sufficient time for each athlete, a gradual approach to athlete understanding, and a thorough consideration of specific situations.

Article 3

Need-supportiveness and athlete well-being. Berntsen, H., Ivarsson, A., & Kristiansen, E. (Submitted, March 2019)

The aim of this study was to evaluate a need-supportive intervention targeting sport school coaches, and to explore how coaches' behaviour affected athletes' well-being. In a sample of youth elite student athletes, we investigated: (a) the potential change in perceptions of need-support from the coach (over an academic year), and (b) the within-person relationship between need-supportiveness and subjective vitality at the end of the academic year. The 102 student athletes completed three questionnaires over an academic year (beginning, middle, and end) to assess coach need-support and subjective vitality. Bayesian growth curve analyses revealed that the levels of relatedness and autonomy-support were stable and high throughout the year. In contrast, competence-support decreased during the season. In addition, the results showed a credible positive within-person relationship between changes in all three facets of need-supportiveness from the coach and vitality measured at the end of the season. We argue that through the intervention, coaches learned strategies and gained awareness of their coaching style, and this may have ameliorated the negative effects of pressure to perform and win that is prevalent in the elite sport context, which may have meant that they stayed relatedness- and autonomy-supportive throughout the season.

Article 4

Perceptions of need-support when "having fun" meets "working hard" mentalities in the elite sport school context. Berntsen, H. & Kristiansen, E. (Published, October 1st, 2018).

The aim of this study was to investigate athletes' and coaches' perceptions of coach need-supportive behaviour and to increase our understanding of the athlete-coach dynamic in the endorsement process. Video-based interviews were conducted with 11 athletes and 10 coaches at an elite sport school in Norway. The interviews were analysed, and narratives were used to tell the story of the predominantly *hedonic athlete* (the aim of sport participation is having fun) and the predominantly *eudaimonic athlete* (the aim of sport participation is development). There was an obvious endorsement misfit between the group of athletes labelled hedonic and their coaches due to the expectations and demands of the elite sport school context. The paradox of the endorsement process intensifies when the "have fun" mentality of the athlete meets the "work hard" mentality of the coach, which, for some athletes, undermines their need-satisfaction, commitment, performance, and well-being. The findings suggest a strong need for a fit between coach and athlete aims for successful coaching in the elite sport school context."

DISCUSSION OF THE RESULTS

Hedda's story: "All my coaches have been hard workers. Getting up really early to prepare for training on the hill. Carrying the gates up the lifts, salting if needed, slipping the courses, filming the athletes, giving feedback to all the athletes. After the training on the hill, they have to up-load the video, charge the drills and radio batteries, prepare and implement coach meetings, for reservations and do book-keeping. Then they have to do dryland training, watch videos with each athlete, and finally after dinner they have a team meeting for planning of the next day. I know how busy it can be to be a coach, and it is crucial that we develop education programs that are facilitated for the coaches work load."

To date, there is no rigid scientific method to grasp knowledge at the practical dimension, which is however crucial for the evaluation of MAPS and coach development (expertise development). The *differential access hypothesis* proposed that different methods capture different kinds of knowledge (Hoffman & Lintern, 2006). These methods have moved from unstructured interviews to structured interviews. Ericsson and colleagues introduced the "thinking aloud" (concurrent verbalization of tasks while performing a task) while experts conducted their tasks (Ericsson, Charness, Feltovich, & Hoffman, 2006). Protocol analysis was another method that has been recommended to use (Chi, 2006), followed by the era of cognitive task analysis, proficiency scaling and social interaction analysis (Hoffman & Lintern, 2006). Today, two main methods are often used when eliciting expert knowledge (i.e., coaches' behaviours): 1) Ask people questions and 2) Observe performance (Hoffman & Lintern, 2006).

In this MMR study, we combined quantitative survey and interview approaches in order to produce complementary and non-overlapping weaknesses and strengthen the meta-inferences (Johnson et al., 2007). The interviews were chosen to capture the subjective experiences of the coaches. Meanwhile, the questionnaires and athlete interviews captured athletes' perceptions of coaches' need-supportive behaviours, giving coaches subjective experiences something to be compared to. The for MAPS developed seven context specific videos were also used as basis for the interviews with coaches and athletes, as they secured a good foundation for in-depth discussions about coach need-supportive behaviours (Bryman, 2015; Harper, 2002; Pink, 2013). This combination of asking questions while observing behaviour might be the best method, to our knowledge, to capture coaches' perception of need-supportive behaviours at the practical dimension.

The discussion focusses on the theoretical and practical implications of the study and consist of two main sections: 1. Practical implications for (1a) Coach development, and (1b) Athlete experience, before 2. Theoretical contributions are outlined together with the study's strengths and limitations (see Table 4). As the distinction between practical and theoretical contributions are not always clear-cut, figure 4 exemplifies this though a continuum.

CONTRIBUTION TO PRACTICE		THEORETICAL CONTRIBUTIONS
COACH DEVELOPMENT (THEORETICAL DIMENSION) Digital workbook informed by pedagogical principles seems fruitful for coach learning (CDP developers)	Adding explicit ("how to") need-supportive skills to Mageau and Vallerands seven autonomy-supportive strategies	SDT Started investigating person-environment fit to understand the endorsement process
COACH DEVELOPMENT (MEANINGFUL LEARNING DIMENSION) Videos explaining all the strategies – a tool-box for coaches.	Translating theoretical constructs to practice: Showing how to act need-supportive through video fragment	SDT Coach need-support (all three dimensions) has a credible positive relationship with athlete well-being in the elite sport school context, thus supports SDT
COACH DEVELOPMENT (PRACTICAL DIMENSION) MAPS: Guidelines for need-supportive coach development		LEARNING THEORY The presentation of meaningful learning as nexus between the theoretical dimension and practical dimension of coaches learning process model
ATHLETE EXPERIENCE (MOTIVATION) A strictly developmental focus in sport clubs and organizations can be detrimental for athletes with predominantly hedonic aims		
ATHLETE EXPERIENCE (WELL-BEING) Suggestions for federations and clubs implement CDPs teaching coached need-supportive skills to enhance athlete sport experiences		

Table 4 – The continuum between practical and theoretical contribution from the PhD-research project

Practical implications

Coach development

The results suggest that coach development towards positive behavioural change follows three stages: the theoretical, the meaningful learning, and the practical stage (see Figure 2, p. 38). At the theoretical level, coaches can *explain* what need-support is (recall the learning material). Coaches at the meaningful learning stage *understand* how to transfer the theoretical knowledge about need-support to their context. At the practical dimension coaches know *how* to use the strategies in their context. The complexity of the coach learning process is illustrated by the back and forthing process between the three dimensions (the thinking bridges in the learning process model in Figure 2, p. 38). Our presentation starts with the presentation of the learning material, although coaches' engagement with the material brings in their own experiences as well.

Theoretical dimension

The ultimate goal for this CDPs was improved practice (behavioural change). This has been demonstrated as challenging in other CDPs, as transfer from the theoretical to behaviour change can be problematic (Cushion & Nelson, 2013; Morgan, Jones, Gilbourne, & Llewellyn, 2013). Obviously, results from Article 1 suggested that the theoretical anchored workbook increased the coaches' perception of need-supportive skills at the theoretical level by recall. This gave them also an opportunity to compare need-supportive and controlling coaching behaviours and better understand the difference. This is theory made practical, to help coaches leap the gap between theory and practice. The workbook presented the coaches with tools/strategies as the videos showed them *how* to do it. *Visualization* of how to do it, was also one of three main themes outlined in Article 1. Coach "Andrew" explained this by stating:

> Those videos are really easy to understand, and they show the situation in a totally different way than what you would be able to understand from reading about it. And I think that is very good. It is a great medium.

This was an important help for them, and the videos increased their understanding of need-support in the practice field.

The coaches' cognitive processing (thinking about) and relating the theoretical material to their former knowledge is needed to reach the next stage of their learning process. This is illustrated by Thinking Bridge 1 of the proposed coach learning process model (Figure 2).

Meaningful learning

According to the cognitive theory of multimedia learning, meaningful learning requires appropriate cognitive processing during the learning (Mayer, 2010). This happens when the learner integrates, or mentally connects, the verbal and pictorial models (the visual pictures of need-supportive coaching to audio explanations of the skill and text) with prior knowledge (e.g., what they already know about supportive behaviours). At this stage, long-term memory is activated. However, only when coaches can integrate the theoretical knowledge to their own experience, the learning becomes meaningful (Mayer, 2009; Trudel, Culver, & Werthner, 2013). Thus, it is not enough to know what need-supportive coaching is, the coaches also need to know what that knowledge *looks like* for them in *their* interaction with *their* athletes in *their* own context. The transfer of theory to one's own practice may require adaption of knowledge (engagement and thinking) to new situations over an extended period of time in order to reach the meaningful learning stage. While the visualization of the learning material was the starting point of the process, the coaches expressed that it was proceeded by a greater *awareness* of what need-support means for them, for example illustrated by coach "Jeff" (see Article 1):

> One becomes more aware in a way over what to say, what to do or how to act. One thinks more about it, one does that, so that is for sure what it [i.e., the digital workbook] has contributed to. I also think it has given me some ideas for how I should act as a coach, and certainly made me more aware [i.e., of how my action affected the athletes].

Even though the videos provided the coaches with a toolbox of strategies, these strategies need to be adapted and connected to each new situation, by repetition and discussion with others. Coach "Fred" addressed this point in Article 1:

> The videos have the potential to make it clearer when you as a coach should or could respond in different ways. In the digital workbook, Strategy 5 emphasized the importance of allowing athletes opportunities for initiative taking and

> independent work. While I wholeheartedly support this for some athletes, you cannot let one who is always late have this opportunity. It is important that we distinguish between the different situations, and how to respond would depend on the situation and athlete in question. Sometimes we challenge the athletes a little more than the "good coach" in the video in similar situations by coming up with suggestions "can you...?" or "how would it have been if you...?" If an athlete approaches me and says it is not possible to compete three days after a graduation party, I would say that yes, it *is* possible. I make the structure clear for the athlete based on the information about the situation.

This quote from coach "Fred" illustrate how transfer takes place when coaches are able link the theoretical material to their coaching experiences. This is an important step toward behavioural change because it means that the coaches know what "good coaching" looks like in their practice. Without knowing what "good coaching" is, one cannot be expected to improve practice (Côté & Gilbert, 2009; Jones et al., 2012). Thinking Bridge 2 (Figure 2) illustrates the point of a back and forthing process, also expressed by coach "Tim":

> I remember the strategies when I meet resistance or when I realize I should have handled the situation differently, then you remember, and I think 'I should have been smarter, given myself a minute to think before responding' (i.e., giving non-controlling competence feedback).

The practical dimension

Coaches at the practical dimension stage in their learning process know how to be need-supportive towards their athletes. Impact evidence of learning experiences from MAPS (Article 2) revealed that MAPS was helpful in teaching coaches about need-supportive skills at the intrapersonal (awareness of own coaching practice) and interpersonal (interaction with athletes) level. Yet, a successful implementation of need-supportive coaching also depends on the time one has for the individual athlete, a gradual approach of learning and autonomy, and a careful consideration of the specific situation. The test trial of the program revealed that MAPS is more successful with mature athletes (third year with an extensive knowledge of development) than with athletes who lack understanding for both development and why (how)

to take initiative, be involved, and take responsibility for their own development (autonomy). The quantitative results from athletes' perception of coach need-supportiveness in Article 3 were reported to be high and stay high throughout the season (see Table 5). This supports coaches' impact evidences of learning experiences of need-supportiveness through the qualitative interviews. Nevertheless, Article 4 elaborated upon athletes' qualitative perception of the coach-athlete dynamic and coach need-support. When differentiating between hedonic and eudemonic athletes, an interesting difference were found. The seeking fun and pleasure athletes did not endorse their coaches' actions, thus did not perceive the need-supportive behaviours as supportive. This supports the importance of using different methods to grasp coaches' need-supportiveness for a more nuanced picture.

It has been suggested that the limited impact of CDPs on positive behavioural change can be explained due to their briefness (Côté, 2006; Cushion, 2011; Cushion & Nelson, 2013; Solstad et al., 2017). This mirrors theories that acknowledge the importance of extensive experience for positive behavioural change (Dreyfus & Dreyfus, 1980; Ericsson, Krampe, & Tesch-Römer, 1993; Korthagen, 2010; Lave & Wenger, 1991). Coaches' former experiences, their learning situations, and their ability to reflect will further influence coach learning (Cushion & Nelson, 2013). Thus, the proposed learning process model (Figure 2) incorporates and illustrates the importance of the different learning dimensions as well as coaches' engagement and reflection (thinking bridges), as success factor for MAPS and improved coach need-supportiveness.

Athlete experiences

Weather the school context per se may end up being a barrier in the athlete-coach relationship is discussed in Article 4. The reason for this is that the elite sport school context is predominantly competitive and the sport skill development in combination with the competitive nature of this context might naturally challenge coaches' need-supportive interpersonal skills. The school's aim is to develop athletes to the point of them being 'capable of winning medals in international championships, qualifying for university and academic education and developing excellent ethical principles' (Norges Toppidrettsgymnas, 2018, para. 3). Unfortunately, the coaches are bound by the school's structure, and this structure may become a hindrance for them in taking into account the athletes' perspective (i.e., their own aims with the sport participation). For some athletes this might be experienced as control. We evaluated the athletes' experience of coach behaviour change both

quantitatively (see Article 3) with a focus on athletes' perception and experience of the three needs, and qualitatively (Article 4) with a closer look at coach-athlete endorsement process.

Perceptions of need-support

The quantitative results (Table 5) from Article 3 revealed that coaches at NTG were perceived as high in all three dimensions of need-support at all three measurement times. Unfortunately, we did observe a significant decrease in competence-support throughout the season. This is an important finding, as the potential for enhanced motivation and improved performance is only present if coaches adapt their own behaviours to fulfil their athletes' needs of autonomy, competence, and relatedness (athlete centred). The multiple needs effect suggests that the needs work together (Mageau & Vallerand, 2003). This knowledge is of vital importance for coaches working with all three need-supportive aspects of the need-supportive style. So, when the perceived competence-support decreases as it did during this intervention, the coaches must know that the athletes' total sport experience might be threatened. The study also suggests that an extra focus should be on the competence-supportive strategies, as the competence need is constantly challenged by the elite sport school context and its evaluation and competition focus.

The eudemonic and the hedonic athlete

If we only assessed the athletes' perception of coach need-support quantitatively, we would have missed the fact that not all athletes felt supported even though need-support was assessed as high at all three times of measurement (see Table 5). By supplementing the quantitative measures with interviews, we found that the school had two groups of athletes– and by extension two groups of narratives- the predominantly *hedonic athlete* (the aim of sport participation is having fun) and the predominantly *eudaimonic athlete* (the aim of sport participation is development) (Huta & Ryan, 2010). The hedonic athlete felt controlled even though the coach focused on being more supportive, and there was an obvious misfit between the aims of the hedonic athlete and his coach due to the expectations and demands of the elite sport school context. As the hedonic athlete uttered "it is not awesome to talk about goals" and "if you have to set a goal for a new trick, then I do not feel like doing the trick anymore." In contrast, results from Article 4 revealed that the eudaimonic athletes perceived the coaches as need-supportive, supporting the quantitative results. Obviously, the fit between the aims with the sports participation played a crucial role for successful perception of need-support.

The findings suggest a strong need for a fit between coach and athlete aims for successful coaching in the elite sport school context.

This finding also had an impact on the evaluation of the CDP, as it adds to the complexity of how to measure behaviour change in coaches. This is an important finding as it illustrates the importance of capturing dimensions that may not be evident in the quantitative surveys–where four items are used for each of the three dimensions of need-support to assess coaches' behaviours. A typical method bias in quantitative studies can be item valence and complexity (Podsakoff, Mackenzie, Lee, & Podsakoff, 2003). The construct validity suffers if we are unable to measure (capture) the three dimensions of need-support through four items. Other potential method biases in self-reported measures are social desirability, scale format, and scale length. Qualitative research, placed in a critical realist position, assumes a constructivist epistemological position, and all results are interpreted and coloured by the theoretical stance and the researcher's experiences. Mixed methods offer a more nuanced understanding of the phenomenon of perceived need-support, and their limitations.

Variable		M (SD)	1	2	3	4	5	6	7	8	9	10	11	12
1.	Aut T1	5.44 (0.75)												
2.	Aut T2	5.52 (0.89)	0.02											
3.	Aut T3	5.33 (1.17)	0.01	0.63*										
4.	Comp T1	6.42 (0.55)	0.42*	0.21	0.13									
5.	Comp T2	6.21 (0.74)	-0.05	0.73*	0.47*	0.32*								
6.	Comp T3	5.98 (0.86)	-0.09	0.61*	0.76*	0.29	0.59*							
7.	Rel T1	6.31 (0.66)	0.52*	0.18	0.07	0.66*	0.27	0.17						
8.	Rel T2	6.30 (0.72)	0.03	0.59*	0.38*	0.35*	0.82*	0.58*	0.47*					
9.	Rel T3	6.15 (0.77)	0.02	0.56*	0.56*	0.28	0.64*	0.73*	0.26	0.63*				
10.	Vit T1	5.25 (0.84)	0.13	0.43*	0.33*	0.34*	0.47*	0.36*	0.31	0.42*	0.31			
11.	Vit T2	5.19 (0.96)	-0.01	0.50*	0.53*	0.19	0.47*	0.50*	0.22	0.38*	0.39*	0.48*		
12.	Vit T3	4.97 (1.10)	0.13	0.24	0.29	0.12	0.22	0.36*	0.11	0.19	0.29	0.41*	0.53*	

Table 5 - Descriptive statistics and correlations, coach need-support and athlete well-being

Note: Aut = Perceived Autonomy Support; Comp = Perceived Competence-support; Rel = Perceived Relatedness Support; Vit = Subjective Vitality; T1 = Measured at time 1; T2 = Measured at time 2; T3 = Measured at time 3.

* BF > 10

Athlete well-being

Results from Article 3 also revealed that all three needs matter for the athletes' well-being and these results support SDT tenets (Ryan & Deci, 2017). Each of the aspects of need-support are linked to well-being assessed though athletes' subjective vitality. A credible positive relationship was observed between all three aspects of the need-supportive style and

athletes' subjective vitality. Subjective vitality is an indicator of athlete well-being (wellness) as vitality is a state of being fully functioning or thriving (Ryan & Deci, 2017; Ryan & Huta, 2009).

Contribution to SDT

The starting point of SDT was Deci's PHD Puzzle cubes experiment where the test-subjects that got money as a reward for a specific activity lost their intrinsic motivation (Deci, 1975). The conclusion was that sometimes rewards can diminish people's engagement and intrinsic motivation. Thus, the premise of SDT as well as the shift in the field of motivation in recent decades is that it has moved away from the behaviourist way of thinking that you can control someone from the outside, to a stronger focus on how you can facilitate and support people's commitment and engagement in activities. SDT focuses on peoples' inner motivation for doing an activity (Ryan & Deci, 2017). The results from the present thesis reveal that structure can in some instances make need-support (i.e., taking the athletes' perspectives into consideration) an almost impossible task. The hedonic athletes' story emphasized in Article 4 in the discussion of the endorsement process adds to the SDT-literature as it challenges its premise of "not controlling" from the outside.

Understanding the endorsement process

The concept of autonomous regulation is a cornerstone in the SDT literature (Deci & Ryan, 2000). Thus, it is paramount that the coaches understand the importance of autonomous functioning and provide for it in their interaction with athletes. This proved difficult for the coaches because of competing expectations from the athletes and school structure – it was challenging to to give their athletes real choices and meaningful rationales (Article 4). These unpublished quotes illustrate their understanding of autonomous functioning, "Tyler":

> The point must be that, as we discussed earlier, we wish the athletes to have that kind of motivation that makes them practice, even when the coach is not present. A good test is what happens to the athletes' training routines when they go home for the summer.

Another coach explained autonomous motivation this way, coach "Josh" – "It is important to give the athletes the sense of being the 'origin' of her/his own actions." Despite coaches understanding of how to provide need-support and the importance of autonomous functioning for athletes, they were frustrated over some athletes who did not endorse their structure even

when they used the MAPS-tools. One good example of this is the following story by coach "Mark" who talked about the challenge of implementing need-support when athletes do not endorse their actions or accept the structure:

> This year, inspired by MAPS, we focused on structure. One "hot topic" at team meetings have been whether or not the athletes need to be in the same park (training venue). This has been challenging in the past, as the athletes want to decide which park to use at all times. We told the athletes that they could decide themselves on Tuesdays, and that Wednesdays and Thursdays the coaches would decide. We explained to them why it is important for the group to train in the same park at least two out of three sessions so we can give them feedback. Despite these rationales the athletes did not accept our structure. This is a continuous circle. (Previously unpublished story)

As the example above illustrates, despite using the need-supportive strategies, some athletes do not endorse their coach's behaviours and decisions. This challenge forced us to want to increase our understanding of successful need-support in light of the endorsement process. This because it is a pre-requisite for athletes to accept/endorse their coaches' structure and rules to satisfy the basic psychological need for autonomy.

Despite the theoretical claims (Deci & Ryan, 2000) and research suggesting that young elite athletes can benefit from instructions and structure provided by experienced coaches (Mageau & Vallerand, 2003; Matosic et al., 2016), the discrepancies in our data (see Article 4) suggest an amendment and a more nuanced view. The group of athletes we called hedonic (Huta & Ryan, 2010) perceived the mandated activity and rules in the sports context as negative and were vocal about not understanding the importance of nor accepting the training activities and structure of the school and therefore not understanding the coaches' structure. Based on the results from Article 2, I argue that need-support is a gradual process, and athletes will develop understanding about the sport and what is expected and needed to become elite athletes at a different pace, or not at all. Furthermore, for this to happen, the social contexts values must be meaningful to the athletes (as pointed out by SDT)– and not only the coaches. Therefore, when including the match between the context and the athlete's mentalities –a better understanding of when the structure is perceived as control may be achieved. As such, the refining of the theory might have practical consequences.

Strengths and limitations

This thesis has both its strengths and limitations. A clear strength is that MAPS was informed by pedagogical principles, a neglected aspect in current CDPs (Cushion & Nelson, 2013), in addition to be a theory informed CDP. Furthermore, coaches in their natural context were used for testing, in contrast to testing the intervention on students (Cushion & Nelson, 2013). By using the video fragments as common ground for understanding and discussion of need-support and the endorsement process, coach learning were captured.

Despite these strengths, the present thesis also has its limitations. Although the limitations for each article is described in detail within, a few of the most prevalent limitations need attention. First, objective observation of coach behaviour was not included in this study. We relied on coaches' experiences and athletes' perceptions of coach behaviour. This is a limitation as there are discrepancies between coaches, athletes, and observers reports of coach behaviour (Smith et al., 2016). Next, the lack of a control group thwarted the quantitative evaluation of the intervention, but this was also an ethical decision as the school wanted all coaches and athletes to benefit from the program. Finally, the overall sample sizes for coaches and athletes were small. Future research should implement MAPS in multiple sport contexts to gain understanding of its effect on different coaches, athletes, and contexts.

CONCLUSION

This thesis has investigated both what good coaching is (understanding need-support) and how to plan for coach learning (teaching need-support). The design of the CDP was an extensive process, but the guidelines presented in MAPS - in particular the digital workbook with videos, can easily be used when making other theoretical based CDPs. The lack of theory-based youth CDPs is critical, and as such this need-supportive coaching program is an important contribution to the field of coach education. MAPS may be implemented in the Norwegian Ski Federation educational system; however, it may easily be adapted for implementation in other federations CDPs.

The thesis also has some theoretical contributions. First, the coach learning process model (Figure 2) proposes meaningful learning as nexus between the theoretical and practical dimensions and intertwined through reflection and engagement (see also Table 4). As coaching is as a complex social process (the holistic approach to coach learning), the model enables the tracking of coach development for behaviour change. Coach education developers

are encouraged to further investigate the model to understand the coach learning process and future attempts to increase coach knowledge to enhance athlete experiences.

The second contribution to theory is a more nuanced understanding of successful need-support. First, insight into the endorsement process, crucial for athletes' autonomous regulation and adaptive outcomes. The hedonic athletes (snowboard/freeski) participating in the investigation had stereotypical hedonic aims, and it allowed us to investigate how challenging it can be for both athletes and coaches in predominantly eudaimonic contexts for elite development. We propose that future research should concentrate on the person-environment fit to understand how to facilitate an athlete centred sport context that facilitate youth sport participants flourishing. Finally, the study also suggest that an extra focus should be on the competence-supportive strategies, as the competence need is constantly challenged by the elite sport school context and its evaluation and competition focus.

Après-ski

The historical relativistic question is: How would the Stina story have played out if her coaches knew the importance of need-support and how to use the strategies? (and were willing to use them). Would the coaches' hypothetical inquiry about how she was doing (i.e., caring) and acknowledge her feelings made her feel related? Would the way they gave feedback (i.e., non-controlling competence feedback) made a difference in her feeling competent? Or the way they treated her when she did well or struggled (i.e., avoid ego involvement) and that she felt equally important and valued as an athlete regardless of her results. I wish that the Stina story could be rewritten–that athletes and coaches and their interaction have multiple chances.

The important questions are of course if only the coaches should be blamed for the lack of interpersonal knowledge? Or, is it rather the responsibility of the sport federations – and as such a system default? In the same way as the sport science department at the NSF provide coaches with recommendations for physical training and days of skiing and technique to make sure athletes excel – interpersonal skills are as important for the athletes' well-being, motivation and development. The supporting evidence for the importance of need-support for athletes' adaptive outcomes should be taken seriously and implemented in all coach education programs. The *après-ski* experience for each athlete will matter for each individual athlete – their experience of success or failure is lifelong. Thus, all athletes deserve a sports context that values their well-being and fosters the love for their sport. This is a small contribution to a big quest: Improving coach knowledge to enhance athlete experiences.

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THE ARTICLES

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Successful coach learning: Digital workbook informed by pedagogical principles

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Abstract

This study was based on the hypothesis that advances in cognitive science may be helpful for Coach Development Programs. We wondered: How can a learning tool such as a digital workbook that is informed by evidence-based pedagogical principles be helpful for coach development? After designing the learning material, based on the cognitive theory of multimedia learning, the digital workbook was used in a coach development program that aimed to improve coaches' need-supportiveness. Ten coaches at an elite sport school in Norway attended the program over a season, and afterwards they were asked whether the learning material had contributed to their knowledge of need-supportive skills. Thematic analysis of the interviews revealed visualization, awareness, and transfer to one's practice as the three main themes describing the educational value of the digital workbook. The material *showed* the coaches how need-support can be acted out in a sport-specific context. Additionally, the learning material resulted in increased engagement and awareness through coaches' reflections, which is an important step towards integrating new material to prior knowledge and create meaningful learning. Finally, the coaches highlighted transfer of the presented learning material to their practice experiences. We conclude that cognitive science may have useful implications for the design of effective learning materials for coach development programs.

Keywords

Assessment of learning tools, coach development programs, coach learning, cognitive theory of multimedia learning, designing learning tools

Introduction

Research shows that few coach development programs (CDPs) and coach education interventions lead to coach learning.[1,2] Furthermore, there is little scientific evidence that CDPs have a long-term impact on coaching practice.[3] CDPs can be defined as systematically applied learning activities that are designed to change coaches' behaviors through education, social interaction, or personal reflection.[4] CDPs aim to improve coach effectiveness in different domains, such as professional knowledge (sport specific), interpersonal knowledge (relation-building skills), or intrapersonal knowledge (capacity to intersect and reflect).[5] However, "effective coaching" is not a self-evident concept. Côté and Gilbert[6] suggest that there are three key elements to effective coaching: (a) coaches' knowledge/behavior, (b) the outcome of the application of that knowledge/behavior, and (c) the coaching context.[6] Coaches who consistently use theoretical and practical knowledge in training sessions or competitions and adapt it to the athletes and their contexts are effective. However, while there are numerous prescriptions for coach learning, evidence of coach learning is limited.[7]

A central issue in the field of sport coaching education is increasing the effectiveness of coaching.[4,5] However, before we can expect coaches to change and become more effective by attending a CDP, we need to understand how we can successfully initiate that change.[1] One way to achieve behavioral change is

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through applying theories of learning.[3] Paramount for successful learning is the underlying pedagogy (i.e. how the learning material contributes to the learning process).[8] Interviews with coaches in different domains reveal that CDPs typically play a marginal role for coach learning compared to learning from experience.[3] Coaches spend much more time on coaching and interacting with athletes than in coach education programs.[9,10] This highlights the need of focusing on the design of the CDPs. The aim of the present study was twofold: (a) to design a digital workbook that is informed by evidence-based pedagogical principles and (b) assess the educational value of the digital workbook for coach development.

Theoretical framework

This study is based on the hypothesis that advances in cognitive science are helpful for the design of CDP learning materials. We will address *why* knowledge about learning is important, before outlining *how* theory should (can) be taught, and *what* we chose to include as the content of the designed digital workbook.[11,12]

Why – The holistic approach to learning

There are different ways to understand learning and thus inform the practice of coach learning. There are three main approaches to learning theory (i.e. behaviorism, cognitivism, and social/constructivism).[13] The holistic approach to learning acknowledges that different theories capture parts of the whole; indeed, not one coaching approach fits all learning situations.[14] We developed a theoretical framework that incorporates different learning theories.

Learning dimensions

A major concern regarding the effectiveness of coach education is the transfer of theoretical knowledge to practical skills, or lack thereof.[15,16] On the one hand, we have theoretical knowledge, on the other practical. This mirrors the distinction between theory and practice that seems problematic in skill acquisition.

The horizontal column in Figure 1 shows three learning dimensions, and we added two bridges to connect them. The *theoretical* dimension is the "knowing-that", including knowing *why* to act need-supportive, and what constitutes good coaching. The *practical* dimension is knowing-*how to act*, *which* is difficult to articulate. Some theories explain the transcendence between "knowing that" and "knowing-how" (i.e. Mesterlære (apprenticeship),[17] situated learning,[18] the three-level model of professional learning,[19] and the five-stage model of the mental activities involved in directed skill acquisition[20]). We propose the *meaningful learning* dimension as the *nexus* between the theoretical and practical dimension as the coaches relate practical experience and theoretical knowledge and understand how they connect; or not.[21] Meaningful learning is not behavioral change *per se*, but it is important for behavioral change. This is an important distinction as we will assess whether coaches can apply

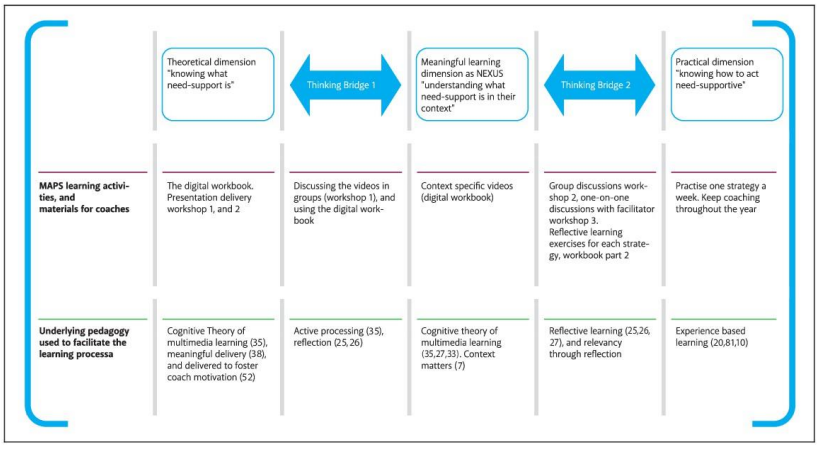

Figure 1. The learning process and pedagogical principles informing the motivation activation program in sports (MAPS).

knowledge about need-supportive skills to their previous experiences – not the actual behavior change.

Using theory to improve practice has proven difficult in the field of coach development, and coaches' engagement with the real world may need to be better monitored, understood, and evaluated to improve coaching expertise.[22,23] It has been suggested that the learning process needs both experience and reflection to understand what theoretical constructs mean in practice.[24–26] The combination of this is reflected in the two bridges in Figure 1, as coaches' engagement and reflection (internal learning situation) are essential in a meaningful learning process. The bridges illustrate that the thinking process goes back and forth between the meaningful learning dimension and the theoretical and practical dimensions, and they illustrate the notion that learning is not a linear process (see Jones et al.[27]).

The intervention implementation in relation to learning dimensions

The transfer problem is pervasive in discussions concerning formal and informal learning.[28,29] On one side, there is the traditional, formal educational system, which is "highly institutionalized, bureaucratic, curriculum driven, and formally recognized with grades, diplomas, or certificates" (see Merriam et al.,[30] p. 29). Informal learning on the other hand is concerned with the individual's ability to experience and learn through self-motivation. Naturally, there are factors within the social context as well as within the individual (doing, thinking, and feeling) that affect individual learning.[31–33] Coaches' experiences (i.e. biographies, cognitive structure) and the specific learning situation (i.e. mediated, unmediated, internal) plays a crucial role in coaches' learning process.[24,25,33] The suggested learning situations of the *Motivation Activation Program in Sports* (MAPS) are described in the "MAPS learning activities and materials for coaches" in the vertical column of Figure 1 and explanation of "underlying pedagogy used to facilitate the learning process" for the activities and material is presented in the lower vertical column of Figure 1.

How – The cognitive theory of multimedia learning

Given the lack of detailed guidelines from the coach education literature on how to design learning materials for coach learning, we turned to the science of learning and the cognitive theory of multimedia learning,[34,35] one of the most thoroughly developed research-based theories on how people learn from words and pictures.[35,36] There are several different theories within the cognitive science tradition (i.e. cognitive load theory, cognitive affective theory of learning, cognitive theory of multimedia learning). We prefer the cognitive theory of multimedia learning because it is based on the assumption that people learn from a combination of words and pictures, and uses information-processing to explain how people learn.[35] This theory was a good fit for the planning of an intervention designed to use video, a well-known training tool for coaches in addition to the use of textbooks. Coaching training can be very theoretical and *showing* coaching expertise in context-specific situations was deemed beneficial and appropriate.

Multimedia learning includes learning from textbooks that contain text and illustrations, computer-based lessons that contain animation and narration, and face-to-face slide presentations that contain graphics and spoken words.[35] How information is presented impacts processing capacity. Information can be conveyed through spoken words, as text and pictures, or as multi-presentation (music, text, spoken words, and pictures and moving pictures).[37,38] Multi-presentations are effective educational means.[35,38] To understand how the mind works and how to design learning materials for meaningful learning, three main assumptions need consideration.[39]

The dual channel assumption

First, human information processing has two channels.[35,40,41] This so-called 'dual channel assumption' was introduced by Paivio in 1986, called the dual-coding theory,[42] and has been supported by recent researchers.[35,41,43] The *auditory/verbal* channel processes sound through the ears: auditory input or verbal representation. The *visual/pictorial* channel processes images through the eyes: visual input and pictorial representations.[39] The assumption is that presentation of information through two channels simultaneously leads to better learning than through one single channel.[21,41] For example, it has been argued that pictures can be easier recalled than words.[44] Sound and pictures activate more memory processes than spoken words alone and this increases the chances of knowledge retention, as long as no contradictory information is given through the different presentation forms.[37,38] Simply put, a multimedia presentation offers better results.

The channels have limitation. Our working memory has limited capacity for processing information.[21,35] In contrast, our capacity for holding information in sensory memory and long-term memory seems unlimited. Only a limited amount of processing can take place in the verbal and the visual channel at any one time.[43,45] Mayer's research has shown that multimedia

presentations lead to better learning, especially when speech and image are combined rather than text and image.[35] This allows for stretching of our information processing capacity (quality). The ability to stretch the span of the channels when exposed to multimedia presentations is of great importance to learning.[41]

Active processing is needed for meaningful learning. The third assumption focuses on the selection, organization, and integration of new material.[35,46,47] The information needs to get organized and then integrated into already existing knowledge.[21] For example, coaches need to engage in cognitive processes when learning (selecting words and images, organizing words and images, and integrating the information to prior knowledge), before being able to apply what is taught to new situations. Meaningful learning requires the internal state that initiates, maintains, and energizes the coaches' efforts to learn the material. Motivation can improve coach learning as long as there is not a constant overload of extraneous processing or distracted from essential processing.[48] The facilitator delivering the intervention should also be need-supportive to foster high-quality motivation in the coaches (see Figure 1). This active processing requires five cognitive processes: selecting words, selecting images, organizing words, organizing images, and integrating;[39] thus, design is important.

Developing authentic material for the MAPS

There are potential problems in multimedia learning situations relating to the three aforementioned assumptions. Mayer[21] proposes three instructional goals and nine principles for design of multimedia lessons to optimize the information processing system and increase meaningful learning. These principles are derived from empirical research in the field of education, specifically the cognitive theory of multimedia learning.[21,35,39] Learning outcomes in multimedia research have typically been achieved by using problem solving transfer tests.[35,39] The design of the digital learning tool for MAPS followed the following three steps.

Step 1. The first goal is to reduce extraneous processing in order to avoid unnecessary information,[35] as people learn better from multimedia lessons that exclude extraneous material (the coherence principle; see Mayer[35]). We only included learning material that was relevant for the instructional objective, and important materials were highlighted by using outline, headings, and pointer words (signalling principle; see Mayer[35]). To prevent the learner from losing attention by going back and forth between two different pages, words explaining the pictures were placed on the same page, and near rather than far from the corresponding graphic (contiguity principle; see Mayer[35]).

Step 2. The goal in this step is to manage essential processing to avoid overloading the system. The *selection* of important words and images plays an important part because the working memory is limited.[39] People learn better from multimedia material if they are introduced to the words and concepts first (pre-training principle) and when sessions are broken into smaller sections that are learner-paced (the segmenting principle).[21,35] The design of a digital workbook ensured that learners learn at their own pace. In addition, people's auditory-verbal channel is typically under-used due to focus on printed material, and therefore a voice-over was used in the design (modality principle; 25).

Step 3. The third instructional goal focused on fostering generative processing through multimedia, personalization, and voice principles[21,35] to help coaches make sense of the information about need-supportive skills, organize the new material, and integrate it into prior knowledge. We used videos because, as pointed out before, people learn better from words *and* pictures than from words alone (the multimedia principle). A (human) narrative voice-over offered information about "*your* athletes" rather than "athletes" (personalization principle). The *voice principle* is that we learn better from lessons narrated by a human voice rather than a computer voice.[21,35]

What: Need-supportive coaching skills

There has been a dearth of research on the challenges and complexities of a need-supportive approach to coaching,[49] and there is currently limited evidence informed practice, particularly in examining learning tools employed in coach education. For a CDP to be theory informed, researchers must show how the strategies map onto the theoretical construct.[1] The need-supportive learning skills in our coach development program are derived from self-determination theory (SDT; see literature[50–52]). More precisely, we extended Mageau and Vallerand's[11] autonomy-supportive strategies. Need support is defined as autonomy support accompanied by structure and interpersonal involvement.[12,53] Mageau and Vallerand's model shows that autonomy-support encourages the satisfaction of all three basic psychological needs. Focus on support for competence and relatedness (structure and interpersonal involvement) was secured by adding *explicit coaching skills* (See Figure 2; see literature[11,12,52–57]) for each of the original seven autonomy-supportive strategies.[11] *Need-supportive coaching* towards young athletes is associated with higher quality motivation (associated with adaptive outcomes) and well-being in these athletes.[11,12,53]

Need supportive skills were chosen as previous research found it teachable in domains such as physical

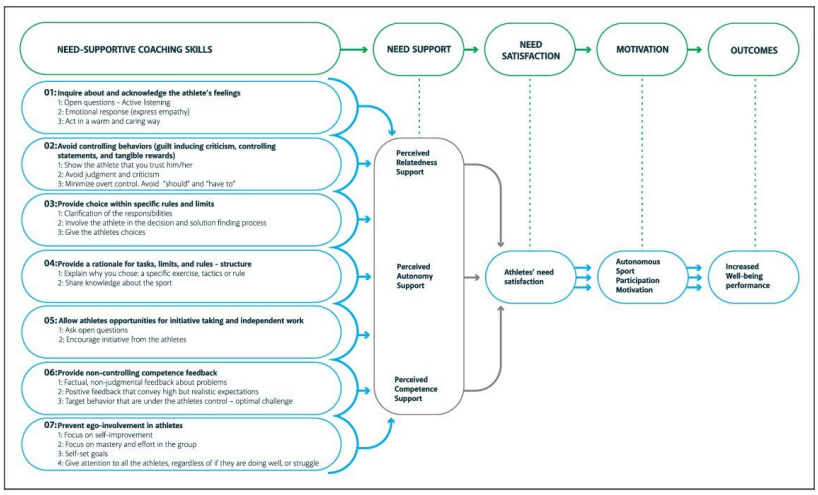

Figure 2. SDT process model of coach need-supportive behaviours influence on sport participation motivation and well-being.[58]

education, exercise, and health.[59] To demonstrate the value of evidence-based pedagogical principle, the aim of this study was to examine the learning material employed in this CDP and fill a gap in coach education literature by designing a multimedia learning tool to improve the efficiency of the CDP. Thus, we asked: What is the educational value of a digital workbook (learning tool) that is informed by evidence-based pedagogical principles, for coach learning?

Method

Philosophical assumption

Qualitative research is a complex mix of different traditions, orientations, and techniques, and philosophical assumptions determine its quality and (mis)alignment of approaches and techniques.[60,61] Five main approaches (i.e. narrative, phenomenology, grounded theory, ethnography, and case study) have been suggested in qualitative inquiry.[62] Bradbury-Jones et al.[60] suggest adding "generic qualitative" approach to these main approaches. In their recently published review on the state of qualitative research in health and social sciences, they found that almost half of the articles belonged to the generic qualitative, as well as having the highest level of alignment. Through their wheel of alignment, they argue for the possibility of pluralism (i.e. using different methods) as long as stating level of alignment for rigor.[60]

Based on the above recommendation, the methodological approach of this study is generic qualitative with an interpretive epistemology. The post positivistic approach of critical realism[63] has emerged as one of the most powerful directions in philosophy of science, offering a good alternative to positivism and constructivism.[64] Critical realism merges classical realistic ontology (there is a real world that exists independently of our perceptions of it) with an interpretive (relativism) epistemology (our understanding of the world is constructed and colored by our subjective perspectives).[65] With an interpretive epistemology comes the subjective nature of the research process, which makes transparency important (i.e. describing the procedures)[61,66] in the construction of knowledge.

Participants and their context

The context of this research was an elite sport school, the non-profit private foundation The Norwegian College of Elite Sport (hereafter NTG), which can be referred to as elite youth coaching. NTG is a network of six elite sport schools in Norway, with 990 students participating in 27 different sports.[67] Current and former NTG athletes have achieved considerable success, accumulating in 186 world championship medals and 77 medals in the Olympics.[67]

The current investigation took place at one of the sport schools, and all 10 coaches between 25 and 54 years old (Male = 9, Female = 1, M age = 36.4,

SD = 9.167, alpine skiing $n = 2$, cross-country skiing $n = 3$, biathlon $n = 3$, snowboard and freeski $n = 2$) participated. The coaches' working experiences ranged from no prior full-time (only club based experience), to true veterans with over eight years of experience at NTG (M = 5.4, SD = 4.35). Of the 10, 2 have long careers as national team coaches at the world cup level in addition to their NTG coaching experience. Six of the 10 coaches had a university education in sport sciences (four Masters, two Bachelors), which made them a well-educated group and ideal for the intervention based on SDT.[52] Two of the coaches without university education were certified elite coaches through their respective federations.

Procedures

After obtaining approval from the Norwegian Social Science Data Services, informed consent was obtained in the beginning of August 2016, before conducting the three researcher led workshops (24 August, 5, 11 and 13 October 2016), followed by semi-structured interviews (May 2017). The coaches were informed about the project before the implementation of the intervention (workshops), as well as their participation rights.

Knowing the context

Expert knowledge about the context of youth sports (especially skiing) was very helpful when producing the learning material of MAPS and especially while developing the video scripts. Facilitators' knowledge on context and coaching was suggested as a success criterion by Trudel et al.[33] as the facilitator meets coaches with different biographies. In addition to extensive experience as a coach and former elite athlete in multiple snow sports, the first author travelled around Norway, visiting ski clubs, presenting and discussing need-supportive strategies as part of the research for the development of the learning materials. The researcher also spent a week in a ski resort with a group of elite skiers and their coaches. The athletes and the coaches were given drafts of the manuscript and asked to act out the different roles and contexts. The researcher (facilitator) explained, instructed, and talked with the "actors" as they acted out the scenarios. As a perceived sense of being controlled depends also on non-verbal factors, the scripts were acted out; tone of voice and non-verbal expressions are essential to clearly distinguish between the two different coaching styles.

Using the digital workbook

All coaches were introduced to the digital workbook as part of a presentation on need-supportive coaching strategies at the first work shop at the elite sport school. Shortly after the first workshop, the coaches received the digital workbooks as a link, sent to their work e-mail addresses. The digital workbook was downloaded onto their tablets, phones, or computers – making it easily accessible. Coaches reported that they read through the workbook and watched the videos before we met for the second workshop (i.e. presentation and group discussions) and third workshop (i.e. one-on-one sessions with the facilitator). Some coaches reported that they used the workbook frequently throughout the season. Having access to the learning material throughout the season gave the coaches an opportunity to use it when time permitted.

The content of the digital workbook

The design of the workbook followed principles of learning in line with the cognitive theory of multimedia learning as outlined above[21] and was divided into three parts. In the first part, benefits of a need-supportive coaching style are outlined and key concepts explained through text with tables, graphics, and pictures in part one of the coaches' workbook. Part two of the workbook contains video fragments that show each of the seven strategies. Between the workshops, coaches were asked to work with one strategy per week, by preparing for hypothetical situations, and then reflecting retrospectively about how it went when they tried to use the strategy (see Figure 1). In part three, personal, contextual, and social influences on coach behaviors are presented.

The *video fragments* (1.37–3.18 min) show how coaches can act need-supportive. All videos had a similar structure; first a sport-specific scenario is described by a voice-over. The videos show athletes practicing while music is fading out and (human) voice-over starts. Next, we witness a dialogue between a coach and an athlete or a monologue by the coach. The coach behavior in each scenario is shown in a need-supportive way ("good coach") as well as a controlling way ("bad coach"). The videos end with a reflection by one of the athletes of how it felt to be treated in a need-supportive versus a controlling style.

Interviews

The coaches' assessment of the learning material may offer important insight into the effectiveness (or lack thereof) of the learning material. Typically coach transfer retention tests have been used to assess meaningful learning.[35] As the aim is to understand the nuances of the coaches' experiences with the digital workbook and to explore their understanding of the seven need-supportive coaching skills,[68] we chose interviews to explore coaches' perceptions of the digital workbook,

whether it had fostered meaningful learning, and to ask about their ability to use the material to talk about how they coach.[68,69] In addition, interviews can help us to understand the meaningfulness of the implementation of programs.[68,70]

The semi-structured interviews were conducted six months after the end of intervention (May 2017), and the interview guide[71,72] focused on five areas of the coaches' (learning) experiences with MAPS. First, the coaches were asked about their experiences with the intervention and MAPS as a whole (all the workshops). Next, the coaches responded to the extent they used the digital workbook and what they thought about the different parts of it (e.g. text, videos, and scenarios). We went on to explore coaches' perception of learning (whether they changed something in how they coach or think about their coaching), then the coaches were asked about their opinions as to what they would suggest as revisions to the program, and finally, what they found challenging. The first author conducted the interviews. The interview guide was piloted with two coaches (not from NTG), one freeski coach and one alpine coach (this data not included here). During this pilot, the interviewer learned to listen and not interfere but use prompts to encourage the participants to keep talking. Small changes to the interview guide were made regarding how to ask open questions and get detailed answers rich in texture. Learning which prompts can encourage coaches to keep talking was helpful as well. The interviews lasted about an hour and were audio recorded. The interviews were conducted at school offices. Each interview was conducted in one of the offices that were available at the time of the interview. Pseudonyms were used when writing up the report.

Data analysis

The interviews were transcribed verbatim, which resulted in 88 pages of raw text. The data set was analyzed through the six-phase approach of thematic analysis.[73,74] The process started with the first phase of *familiarize one's self with the data*, consisting of doing the interviews, listening to the audio tapes, reading and re-reading the transcripts. This process helped us become familiar with the content of the dataset as we invested great efforts in reading the text and listening to the audio files. Next, in phase two, *generalizing initial codes*, potentially relevant codes (for the research question) were highlighted. These were interpretive codes for "what participants say." The codes were written down (e.g. makes it easy, explaining through situations, seeing the action, etc.), and the text associated with it marked. The next phase of the analysis process was *searching for themes* that represent meaning.[73] Through this active process,[74] we constructed the themes and sub-themes by collapsing and clustering codes that seemed to share unifying features and meaningful patterns of the data set (see Table 1). Emerging findings were compared with the data to verify understanding and were also discussed with colleagues. When looking closer at the codes representing coaches' experience with the learning material for the learning process, we went through the process of evaluating code clusters several times, developing themes for the coded data "quotes" and the dataset as a whole. In phase four, *reviewing potential themes*, themes were reviewed in relation to the coded data and entire data set relevant to the research question. This involved making sure each theme had boundaries, and we generated enough data to support the theme with coherence. Finally, we identified three main themes regarding the value of the multimedia learning material. The main themes had four, three, and two sub-themes, respectively, and there was consensus regarding these themes between the two researchers' thematic analysis process. *Defining and naming themes* is the fifth phase. With the research question in mind, the themes were titled in a way that captures their meaning in relation to the effectiveness of the learning process. After we reached saturation,[75] quotes were selected for the report or *producing the report* (phase six).

Rigor

The interviews were conducted in Norwegian by the first author. We carefully translated the quotes in English to make sure the meaning was conveyed with accuracy. The first author is fluent in two languages. The data were aggregated to maintain anonymity, following ethical guidelines.

Member reflections

As the research process evolved, an early draft of the article and tables with quotes were sent via e-mail to all the coaches to ensure accuracy of meaning translation and to enhance trustworthiness. Further, member reflections[66,76] helped create high quality, meticulous, and robust research. Member reflections are not done to verify the research but rather to generate additional insight. This logic of justification is in line with the critical realist position since the realist epistemological position acknowledges that we can never know the objective world.[66] The data analysis process did not reveal negative case analysis, as all the codes seem to fit the developed categories.

Critical friend

Inter-rater reliability as traditionally used by Lincoln and Guba[77] is ineffective in ensuring that the findings

Table 1. Coaches' assessment of the value of the digital workbook for coach learning.

Codes	Sub-themes	Main themes	General dimension
See action Video learning Reading Evidence for good practice Understanding why Funny examples of coach practice	See what to do	Visualization	Coach learning process
See compare to reading Behavior	Reflective thinking		
Makes it easy Explaining through situation	Better understanding Remembering		
Ideas for action Information about context Experience similar situation	Recognition (context specific)	Awareness	
What kind of communication is good Transfer knowledge to practice	Aware of what to say and do		
Reaction Change practice	Know what "I" need to change		
Think about what I should have done Self-evaluate Time commitment Complex situations On the go Come with a solution	Self-evaluation Transfer	Transfer to own practice	

are reliable, as we cannot know the objective world.[66] The critical friend strategy is an opportunity for dialogue to acknowledging multiple truths, perspectives and results in the research process, and may be a marker of rigor in qualitative research.[66,78] The second author acted as a critical friend throughout the process, from data collection, analysis, and writing of the manuscript. Coders met in person on several occasions to discuss codes and meanings. All the text was coded and multiple paragraphs were marked for each code. Feedback from both coders was discussed to reach an agreement of the coding. Emerging findings and final draft were also read and commented on by an experienced scholar within the field of sport.

Results

The coaches' understanding, adaption, and evaluation of ability to transfer the meaning of the need-supportive skills to their own practice as revealed by the interviews are summarized in Table 1. The thematic analysis revealed three main themes and nine sub-themes. The two overreaching themes were coaches' perceptions of the format of the learning material (visualization and awareness) and its contribution to foster meaningful learning (by transfer to own practice).

Visualization

The first aspect of the coach learning process, visualization, had four sub-themes; (a) see what to do, (b) reflective thinking, (c) better understanding, and (d) remembering. Overall, the major advantage of using videos, in contrast to text only, was that it showed the coaches *how* need support can be acted out in a context-specific way. They experienced the videos as a medium that helped them recognize context-specific situations. The inclusion of athletes in the sport they usually coached also helped as they more easily could relate to the issues dealt with. To *see what to do* was the main reason given by the coaches as it gives you the "essence of the task" immediately. As Mark (pseudonym) emphasized:

> What I remember is that it is really easy to see how one should act according to the videos, what the point of the situation is and how this is illustrated by the different scenarios. I thought that was good. I absolutely found this instructional.

Seeing is followed by thinking in the coaches' process, and it was helpful to them to see their own practice from an outside perspective. The videos' design invited coaches' reflection on coaching styles and situations,

and seeing it with colleagues they trusted also fueled the reflection process. Forest explained how sounds and images helped him in his thinking process: "it really made me think about which strategies I use, which words I use and whether I use the hard or the supportive tone, you know." By viewing others, they "reflect on what *I* do" – including self-criticism – more easily than when just discussing coaching strategies. Furthermore, this reflexive thinking also leads to better understanding of the coaching context, as this quote from Andrew shows:

> Those videos are really easy to understand, and they show the situation in a totally different way than what you would be able to understand from reading about it. And I think that is very good. It is a great medium.

The videos content is communicated through a multimedia format, and as such enhanced the coaches' understanding of coaching styles in a way just reading about them never would have accomplished. The use of contrasts in the material by using "good" and "bad" coaching examples, made them laugh and see more clearly what could be gained (or lost) by not using the more advantageous coaching style. Several of the coaches mentioned that they had used the name of the "bad coach" in the video as a nickname for coaches who had been unreasonable toward an athlete. This kind of engagement with the material is essential for remembering. The videos stuck with the coaches. Tyler expressed how the videos helped him remember the material:

> Even if you just pay a little bit of attention when watching the videos, you will remember them much better than any text. If the learning material only consisted of text, it would have been much harder to recognize the different situations.

Awareness

The second aspect of the coach learning process, awareness, had three subthemes; (e) recognition, (f) awareness of what to say and do, and (g) awareness of what "I" need to change. This aspect is related to another major advantage of the videos, in contrast with text only, which is that being able to see and compare coaching style heightens the awareness of one's own practice. In short, they shared that the digital workbook made them much more aware on how they *acted* as coaches. For example, Adam explained how the videos helped him recognize different contexts, "To see it this way, makes it very visual and it is easy to recognize the different situations. This was clearly aimed at us (situations in the videos), so that is very good. I think it worked well." The scenarios were tailored to reflect typical situations, problems, and challenges. Using these familiar situations heightened coaches' awareness of how to be need-supportive (or controlling). In other words, the theoretical concepts became alive.

The recognition of context specific situations increased coaches' awareness of what to say and do. This example from Josh shows the awareness aspect of the learning material:

> One becomes more aware in a way over what to say, what to do or how to act. One thinks more about it, one does that, so that is for sure what it [i.e., the digital workbook] has contributed to. I also think it has given me some ideas for how I should act as a coach, and certainly made me more aware [i.e. of how my action affected the athletes].

The coaches seemed to have developed specific ideas for how they should act towards their athletes for optimal athlete motivation. Awareness through recognition leads to awareness of what to say and do, and this can lead to an awareness of what to change. This was expressed by Seth: "Both the strategies and working specifically with the strategies makes us more aware of how one acts. Because one has its own things that that one can see that one should work on." The awareness process goes back and forth between the material and scenarios in the videos to their former and present experiences in the field. The awareness of different scenarios can be further developed by proposing different background information about the athletes and coaches in the videos. For instance, in a discussion session the facilitator could offer different background information for the videos, for example, an athlete who typically does not ask for less training but who suddenly does so. This may increase awareness that sometimes, this type of request needs to be met differently.

Transfer to one's practice

The third aspect of the coach learning process, transfer to practice, had two subthemes: (h) self-evaluation and (i) transfer. Self-evaluation was discussed in all the coach-interviews due to it being a natural part of the learning process. For example, Tim expressed:

> I remember the strategies when I meet resistance or when I realize I should have handled the situation differently, then you remember, and I think "I should have been smarter, given myself a minute to think before responding" (i.e., giving non-controlling competence feedback).

Tim's example shows the back and forthing between experience and material, and represents a great step

toward transfer. The digital workbook also helped them to develop tools for better interaction. However, when using the strategies in new situations, the coach needs to consider different perspectives, he/she needs to evaluate each new situation there and then as well as after it happened. It is complex, and Jeff gave a good example of the ongoing reflection process:

> It is really important to think about how one meets the athletes . . . It can sometimes be a little difficult . . . one athlete approached me: "Jeff [pseudonym], can we practice shooting inside today [part of biathlon training] because its cold and it is snowing?" I remember thinking that we can still practice outside. But he had a better solution, it will be better to train inside . . . The athlete showed initiative and had a good rationale, so for me to stick with my original plan required a rationale that they accepted, but sometimes you simply can't find your rationale before your three seconds are up.

In this situation, Jeff chose to stick with the original plan even though he reflected on both Need Supportive Strategy 5 and Strategy 4 (see Figure 2) and he shows great reflexive skills going back and forth between the strategies and his praxis. Also indicative of the positive impact of the digital workbook is that the coach was still worried that the athlete may have felt left without an explanation.

Transfer shows the complexity of using the skills in real situations, and how coaches used the newly acquired knowledge about what need support is to their coaching practice. Thus, transfer may require adaptation of knowledge to new situations over an extended period of time. The videos provided them with a toolbox of strategies, but these strategies need to be adapted to each situation, and information about the athlete and the sport plays a role in how the coach responds. Fred addressed this point in the interview:

> The videos have the potential to make it clearer when you as a coach should or could respond in different ways. In the digital workbook, Strategy 5 emphasized the importance of allowing athletes opportunities for initiative taking and independent work. While I wholeheartedly support this for some athletes, you cannot let one who is always late have this opportunity. It is important that we distinguish between the different situations, and how to respond would depend on the situation and athlete in question. Sometimes we challenge the athletes a little more than the "good coach" in the video in similar situations by coming up with suggestions "can you . . .?" or "how would it have been if you . . .?" If an athlete approaches me and says it is not possible to compete three days after a graduation party, I would say that yes, it *is* possible. I make the structure clear for the athlete based on the information about the situation.

Fred clearly shows that he understood what initiative taking and independent work means, and he has the ability to bring that into his coaching experience and use it within the boundaries of the structure of the school and group. When this transfer between theory and experience happens, the material has become meaningful.

Discussion

The purpose of this study was to investigate the value of a digital workbook that was informed by evidence-based pedagogical principles. The findings revealed that the design of the workbook increased the coaches' perception of need-supportive skills. In the interviews, the coaches expressed that they started an *awareness process*. They had an opportunity to compare need-supportive and controlling coaching behaviors and shared a few laughs about coach–athlete interactions in the videos. They learned tools for better coaching, also the aim of most CDPs. However, their time spent in CDPs is limited compared to their time spent coaching.[3,10] Therefore, they underlined the usefulness of a CDP that takes place where the coaches learn to coach.[10]

Designing CDPS

Coaches valued the video more than the text and books. As the findings suggest, the videos with situation-context specific videos help coaches visualize, develop awareness of what to say and do, and transfer the new knowledge to their own practice. Learners' preferences and motivation influence their engagement and experience with the learning situations,[48] and through the learning materials, coaches could learn to differentiate between need-supportive and controlling coach–athlete interactions. Using illustrations they could relate to enabled them to relate the material to their coaching practice. Awareness is closely related to relevance when the goal is to reach meaningful learning.[33,35] The relevance also allows the coaches to better engage in their own learning process,[79] which was clearly expressed in the interviews.

Designing the CDP for this investigation (i.e. MAPS) was time consuming. Specific knowledge of the sports and its context and pedagogical principles were starting points before even adding the content! We used real-life problems for coaches in an attempt to construct learning situations where problems of theoretical and craft knowledge are intertwined in the situation specific videos.[27] This helps translate theoretical

constructs/content into real-world actions. The videos made the material relevant for the coaches attending the program, as the actors and situations were all from the elite sport school snow sport contexts. For authentic situation-specific scenarios, the material has to be meaningful.[33] Learning needs to be contextualized and facilitated in an appropriate environment.[13,27] The coach-centered learning opportunities come from the design of the digital workbook. When coaches understand what the theory means for their practice, then this is a great starting point for further reflection between meaningful learning and their experiences (practical dimension), and continued development of need-supportive skills, as seen in Figure 1 (Bridge 2). Reflection increases coaches' understanding of their own practices,[27] which will be important in the next stages of the learning process to improve practice. Each stage in the learning process is important to evaluate in depth to increase our knowledge about what causes coaches to change their behavior. We argue that for better CDP design, different stages of the learning process have to be identified and designed accordingly for coach learning.

The importance of meaningful learning for improved practice

The ultimate goal for CDPs is improved practice (behavioral change). This has proven to be a challenging endeavor due to the problematic nature of transferring theory directly to coaching.[7,80] Our solution to this challenge was to propose a model of coach learning process where theory, thinking, and doing are intertwined (see Figure 1), a model we adapted from Jones et al.[27] In our proposed pedagogical model, meaningful learning happens in the intersection (nexus) between theory and practice. The meaningful learning nexus allows coaches to better engage in their own learning, which is an important step toward behavior change. Thus, the information about how to behave need-supportive can lead to improved practice when reaching the meaningful learning dimension.

Theory has the potential to become meaningful to the individual[33,35] if integrated to her or his experiences. It is not enough to know what need-supportive coaching is. It is essential that the coaches know what the skills look like in their context specific. The cognitive theory of multimedia learning explained how the coach needs to bring the information of the different learning styles to relevant prior knowledge.[35] Similar arguments have been made in the body of coach learning literature. The coaches' ability to see the link between the material and their coaching practice is important for deep learning.[33]

The meaningful learning stage is proposed to represent coaches adaption of the knowledge dimensions (see Figure 1), and essential because it means that the coaches know what "good coaching" looks like in their practice. When moving towards improving practice, Jones et al.[27] argue for the importance of reflection to improve practice. Knowing what need-supportive skills means in their context is a great starting point for learning how to coach through experience and reflection (see Figure 1). When reflecting without knowing what "good coaching" is, one cannot expect improved practice.[6,27] When coaches reach the meaningful learning stage, they will or can reflect on their own practice meaningfully – alone or with other coaches.[27]

The knowledge dimensions seen in Figure 1 have been adapted from Trudel et al.,[33] Mayer[35]and Jones et al.[27] Adapting the theoretical material to one's own practice experience is crucial to reach the meaningful stage.[35] Reflection[27] between meaningful learning and experience is essential for improved practice. As coach learning happens inside and outside of educational settings,[13,81] the meaningful learning stage lays the foundation for ongoing learning.

Strengths and limitations

This article assessed meaningful learning,[35,39] not actual behavioral change. This is a strength, as careful consideration of underlying pedagogical principles is a neglected aspect in current CDPs, and current reviews do not mention this topic at all.[1,4] There is a lack of concern for *how* coaches learn,[7] and thus the careful design of MAPS fills a current gap in research on CDP.

We used coaches, in contrast to testing the intervention on students.[7] This is a clear strength of the investigation. The design also opened interpersonal perspectives in coach education, and the interviews revealed that the education offered by their respective ski federations had not provided an interpersonal perspective. The coaches found MAPS useful as they learned new tools such as the concept of need-support, a concept only one of the 10 was familiar with before. Lefebvre et al.[5] review of CDPs found that only 18 out of 285 programs primarily focused on coaches' interpersonal knowledge/behavior.

The study also has its limitation due to size and the role of the first author who developed the intervention as well as conducted the workshops and the interviews. It is possible that the coaches felt obliged to say positive things about the program due to her being a familiar figure, which might be considered a limitation. On the other hand, her knowledge in the sport encouraged them to attend and engage fully. Trudel et al.[33] encourage a careful selection of the facilitator, as the facilitators' biographies influence the ability to guide the learning process and interactions with coaches.

This suggests the importance of the facilitators' expert knowledge, as they meet coaches with different biographies. As such, the combination of credibility in sport combined with theoretical knowledge was a success factor in this study.

Concluding remarks

Coach education needs to be better supported by empirical evidence.[7,13] We conclude by presenting the contribution of our results to coaching science, and more specifically how to plan for coach learning. The results revealed that coaches perceive the digital workbook, which was informed by the cognitive theory of multimedia learning, to be successful in fostering coach meaningful learning. The distinctive contribution of this article is the outline of the development of educational means for teaching coaches to understand how to be need-supportive that is informed by an underlying pedagogical principle. This may lay the foundation for further development of the effective CDPs. Therefore, advances in cognitive science may have useful implications for how to design effective learning material for CDPs, and we encourage other sports to use this approach to improve their learning material for coaches.

Practical applications of the results

1. The main practical application of this work is that the cognitive theory of multimedia learning as an underlying pedagogical principle is helpful for the design of learning materials for CDPs, an important part of the complex reality of coach learning. Taking a holistic approach opens possibility for combining different types of learning theories.
2. Video as a medium used as part of learning material helped coaches conceptualize, reflect, recognize, and prepare them for the practice context. Also valued as a medium of choice for these coaches.
3. Meaningful learning has the potential to serve as a nexus between theory and practice. It creates what we call a thinking bridge, and may guide coaches towards improved practice.

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Article 2

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Guidelines for Need-Supportive Coach Development: The Motivation Activation Program in Sports (MAPS)

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The purpose of this article is to share the conceptual framework, design, and impact evidence of a coach development program that was aimed at teaching coaches how to act need-supportive toward their athletes. Informed by Self-Determination Theory, the Motivation Activation Program in Sports (MAPS) was developed to contribute a coach interpersonal-style perspective to the Norwegian Ski Federation education system. The program was delivered at the Norwegian College of Elite Sport throughout the 2016/2017 season as a test trial. This article is organized into three sections. First, a detailed description of the conceptual framework used to inform MAPS is offered. Next, a thorough description of MAPS building components is provided. The third section of the article presents impact evidence of coaches' learning experiences together with coaches' practice examples of need-supportive coaching skills. Results reveal that MAPS taught coaches about need-supportive skills at the intrapersonal (awareness of own coaching practice) and interpersonal (interaction with athletes) level. In addition, effective need-support for athletes required sufficient time for each athlete, a gradual approach to athlete understanding, and a thorough consideration of specific situations.

Keywords: coach education, interpersonal skills, need-supportive coaching skills, young athletes

Coaches play an important role in their athletes' sport participation experiences, and they are often responsible for shaping athletes' social environment (Gilbert & Trudel, 2004; Matosic, Ntoumanis, & Quested, 2016). Self-Determination Theory (SDT; Ryan & Deci, 2017) distinguishes between two distinctly different interpersonal styles that influence athlete experiences in very different ways – need-supportive and controlling styles (Ntoumanis, 2012). These styles are orthogonal (Matosic & Cox, 2014), and coaches tend to use a combination of controlling and supportive behaviors. A predominantly supportive style is associated with athlete well-being and adaptive athlete outcomes (Ntoumanis, 2012), whereas a predominantly controlling style is associated with athlete ill-being and maladaptive functioning (Vansteenkiste & Ryan, 2013). A need-supportive coaching style is highly recommended for young elite athletes' well-being and long term competitive participation (Balaguer et al., 2012; González, Tomás, Castillo, Duda, & Balaguer, 2017; Kristiansen & Roberts, 2010; Ntoumanis, 2012).

Coach development programs (CDP) can change coaches' interpersonal, intrapersonal and professional behaviors through education, social interaction, and/or personal reflection when learning activities are systematically applied (Evans, McGuckin, Gainforth, Bruner, & Côté, 2015; Lefebvre, Evans, Turnnidge, Gainforth, & Côté, 2016; Smith, Smoll, & Cumming, 2007). Current reviews suggest that the quality of coach education can be improved when CDPs focus on: (a) coaches' interpersonal knowledge (Lefebvre et al., 2016) and (b) developing and implementing CDPs that are grounded in theory (Allan, Vierimaa, Gainforth, & Côté, 2017; Evans et al., 2015). Lefebvre et al. (2016) classified CDPs into three main categories in their 2016 review. The majority of the 285 CDPs focused on coaches' professional knowledge development such as technical and tactical skills. Only 18 programs focused on coaches' interpersonal knowledge, while six programs focused on coaches' intrapersonal knowledge, revealing that both areas are underrepresented in coach education.

The second area of improvement for coach education is the use of theory informed CDPs. Several reviews have concluded there is a need for CDPs that are grounded in behavioral change theories (Allan et al., 2017; Evans et al., 2015; Lefebvre et al., 2016). Turnnidge and Côté (2017) suggest integrating interpersonal theories into coach education both to explore the interpersonal dimension of coach-athlete interactions and to design effective, interpersonally-focused CDPs. Self-determination theory (Ryan & Deci, 2017) is one such theory. Despite rigorous empirical testing of SDT, effectiveness of the application of autonomy-supportive behaviors is currently unknown to coach education (Vella & Perlman, 2014).

Recently, an attempt to gain knowledge on the effectiveness of the application of autonomy-supportive behaviors to coach education suggests more focus is needed on specific examples of how to implement autonomy-supportive coaching behaviors (Langdon, Harris, Burdette III, & Rothberger, 2015). One CDP design with the aforementioned in mind is the Motivation Activation Program in Sports (MAPS). MAPS was developed to add a coach interpersonal-style perspective to the Norwegian Ski Federation's educational system and ultimately, if evaluated as meaningful,

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part of The Norwegian Olympic and Paralympic Committee and Confederation of Sports. MAPS was implemented at one of the *Norwegian College of Elite Sport* (NTG) schools in the 2016/2017 season. This elite sport school offers a unique research context in the sense that it has been highly successful–former and present NTG students have won 77 Olympic medals and 186 World Championship medals since the beginning of the 1990s (Norges Toppidrettsgymnas, 2018). In the present article, we describe coaches' learning experiences with MAPS.

The aim of this article is to present a detailed description of the conceptual framework used to inform MAPS, share a thorough description of MAPS components and design, and present impact evidence of coaches' learning experiences.

Conceptual Framework Used to Inform MAPS

The purpose of MAPS was to train coaches on how to create a more need-supportive sport context for their athletes, ultimately leading to athletes' autonomous functioning, performance, and well-being. SDT is of great interest for MAPS because one of its central tenets is that the quality of social contexts influences the motivation, performance, and wellness of the people in those contexts (Deci & Ryan, 1985; Ryan & Deci, 2017). By merging the extended version of the coach-athlete motivational model (Mageau & Vallerand, 2003) with the complete SDT causal sequence (Fortier, Duda, Guerin, & Teixeira, 2012; Grouzet, Vallerand, Thill, & Provencher, 2004; Vallerand, 1997; Vallerand, Fortier, & Guay, 1997; Vallerand & Losier, 1999) the SDT process model of coach need-support influence on sport participation and adaptive outcomes was created (see Figure 1).

The model is based on the assumption that coach behaviors influence athletes' motivation through their direct impact of athletes' three basic psychological needs. The degree of need-satisfaction will determine to what extent athletes exhibit autonomous sports participation motivation. One of the key postulates of SDT is that the quality of athletes' motivation will influence athlete outcomes, such as performance and well-being (Deci & Ryan, 2000; Mageau & Vallerand, 2003; Ryan & Deci, 2017). In addition to postulating the difference between intrinsic (something is enjoyable in itself) and extrinsic motivation (external incentive is needed to act), SDT distinguishes between autonomous (doing something by choice and for pleasure) and controlled (doing something out of a sense of obligation or pressure) forms of motivations (Grouzet et al., 2004). The most positive outcomes are derived from autonomous forms of motivation (intrinsic or self-determined extrinsic motivation) (Vallerand, Pelletier, & Koestner, 2008). For example, autonomously functioning athletes have been reported to make greater effort (Smith, Ntoumanis, Duda, & Vansteenkiste, 2011) and persist longer (Calvo, Cervello, Jimenez, Iglesias, & Murcia, 2010) than controlled (non-self-determined extrinsic motivation) functioning athletes.

A consideration of the three basic psychological needs of *autonomy* (the need to feel ownership in sports participation), *competence* (having a sense that one masters the drills and exercises) and *relatedness* (feeling related to the coach and teammates) is critical to understanding how to foster optimally

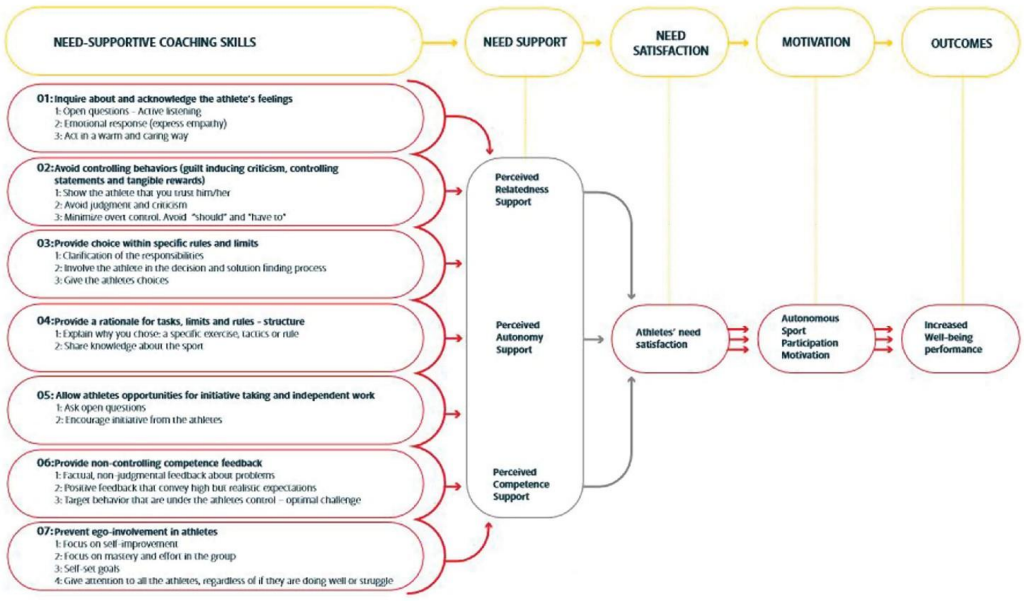

Figure 1 — SDT process model of coach need-supportive behaviours influence on sport participation motivation and well-being.

functioning and flourishing athletes (Deci & Ryan, 2000, 2002; Matosic et al., 2016). Parents, coaches, teammates, and administrators make up athletes' social environment, and they can support or thwart athlete's needs (Ryan & Deci, 2017). Athletes can also be active agents in their own need satisfaction (Reeve, 2013).

Typically, a need-supportive interpersonal coaching style supports all three athlete needs (Ntoumanis, 2012; Taylor & Ntoumanis, 2007; Tessier, Sarrazin, & Ntoumanis, 2010). These need-supportive coach behaviors include autonomy support accompanied by appropriate structure (competence support) and interpersonal involvement strategies (relatedness support) (Mageau & Vallerand, 2003; Matosic et al., 2016; Taylor & Ntoumanis, 2007). Based on the assumption that athletes may benefit from autonomy support accompanied by a well-structured sport context and the presence of high interpersonal involvement, as shown in the physical education context (Jang, Reeve, & Deci, 2010; Tessier, Sarrazin, & Ntoumanis, 2010), MAPS was developed specially around teaching coaches how to support their athletes' basic psychological needs. A set of explicit 'how to' skills was drawn from self-determination theory and research, which resulted in a toolbox for coaches (see need-supportive coaching skills Figure 1 and Table 1).

How to Act Need-Supportive—Explicit Skills

Autonomy-support, involvement-promoting strategies and structure often co-occur (Aelterman et al., 2013; Reeve & Jang, 2006). Equally, because the autonomy-supportive coaching strategies presented by Mageau and Vallerand (2003) have been shown to have a multiple needs effect (supporting more than one need at once), they were considered a good starting point for developing a set of explicit need-supportive coaching skills for MAPS. A detailed description of the need supportive strategies and explicit skills that informed the content of MAPS is offered below.

1. Inquire about and acknowledge athletes' feelings

This strategy supports athletes' need for relatedness and autonomy (Mageau & Vallerand, 2003). By taking an interest in their athletes' life and feelings through *open questions* and *active listening,* coaches can convey their involvement (Sparks, Dimmock, Whipp, Lonsdale, & Jackson, 2015; Tessier et al., 2010). Emotional support can be given by showing *emotional response* and *acting in a warm and caring way* in response to athlete's expressions (Skinner & Edge, 2002; Tessier et al., 2010).

2. Supportive behaviors (Avoid controlling behaviors)

Controlling behavior pressures the athletes to think and behave in certain ways (Deci & Ryan, 1985), and this restrains their autonomy (Deci & Ryan, 2000). In contrast, supportive behaviors can create a trusting context in which the athlete feels cared about and in which her or his relatedness need is supported (Tessier et al., 2010). Explicitly, the coach can *convey trust* by behaving sympathetic, warm, and affectionate (Skinner & Edge, 2002). By *avoiding judgement and criticism and minimizing overt control* (should, have to), athletes can feel supported both in terms of relatedness and in a context that allows them to feel ownership and act for self-determined reasons (Mageau & Vallerand, 2003; Reeve, Jang, Carrell, Jeon, & Barch, 2004).

3. Provide choice within specific rules and limits

Coaches can add structure when *clarifying athlete responsibilities* (Matosic et al., 2016) by being transparent about coach expectations and the consequences of athlete behavior (Taylor & Ntoumanis, 2007). Another explicit skill is to *involve the athlete in decision and solution finding processes* (Amorose, 2007; Standage, Gillison, & Treasure, 2007). When providing choices, it is vital that the athletes perceive them as *real choices* (Amorose & Anderson-Butcher, 2007; Standage et al., 2007) because having choice is important for the athlete's experience of volition in relation to her or his sport participation (Matosic & Cox, 2014).

4. Provide a rational for task, limits and rules – structure

This strategy supports both autonomy and competence. When a coach *explains why he/she chose a specific exercise, tactic, or rule,* it clarifies the reason behind it, allowing the athlete to internalize the meaningfulness of the activity and feel self-determined (Mageau & Vallerand, 2003). Structure comes in the form of the coach giving information about plans and goals in an appropriately structured environment (Jang, Reeve, & Deci, 2010; Matosic et al., 2016). This can happen for example when a coach *shares knowledge* about the sport and how it relates to the plan and chosen skill building activities.

5. Allow athlete opportunities for initiative taking and independent work

This fifth strategy is a predominantly autonomy support strategy. To be successful at facilitating perceptions of autonomy, coaches are encouraged to *ask open questions* to their athletes to have a better idea about athletes' ideas about their developmental process (Amorose, 2007; Stone, Deci, & Ryan, 2009). Central to this strategy is that coaches *encourage initiative* concerning athletes sport participation (Mageau & Vallerand, 2003; Stone et al., 2009).

6. Provide non-controlling competence feedback

As the phrase indicates, this is a cardinal competence supportive strategy, as the informational aspect (rather than controlling) of the activity informs athletes about their competence (Mageau & Vallerand, 2003). Coaches can give *factual non-judgmental feedback about problems* (Ryan & Deci, 2017; Tessier et al., 2010) to facilitate competence satisfaction. When offering contingent feedback in an autonomy supportive way, it relates back to athletes' endeavors and this can influence their feeling of competence and autonomy, as it is self-organized (Deci & Ryan, 2000). The feedback needs to be high in competence-related information and be constructive (Jang et al., 2010). Further, *positive feedback that conveys high but realistic expectations* (Amorose, 2007; Carpentier & Mageau, 2013; Tessier et al., 2010), informs athletes about their sports participation and fosters skill development. Appropriate expectations can facilitate athletes' confidence that they can meet the challenges of the sport (Matosic et al., 2016). Positive feedback supports the competence need directly (Ryan & Deci, 2017). Also, central for athletes to feel competent is to *target behaviors that are under the athletes' control by providing a challenging task* (optimal) (Deci & Ryan, 2000; Tessier et al., 2010). When challenges are optimal, the athlete experiences a feeling of competency (Deci & Ryan, 2000; Matosic et al., 2016). This is also an autonomy-supportive strategy in the sense that it allows for athletes' self-organization in their sport endeavors (Deci & Ryan, 2000).

7. Facilitate self-improvement focus (prevent ego-involvement)

Ego-oriented environments tend to pressure athletes into situations and coach dictated activities to prove themselves worthy. Athletes no longer feel free to choose activities of interest and their sense of self-determination is reduced (Mageau & Vallerand, 2003). One explicit behavior coaches can use to facilitate self-improvement focus and prevent ego-involvement is to provide

Table 1 Coach Learning Experiences Following MAPS

Need-Supportive Strategies (cf. Figure 1)	Description Explicit Skills From MAPS	Examples Coach Behaviours From Interviews	Learning Experience Following MAPS
1. Inquire about and acknowledge the athletes' feelings	Open questions – active listening Emotional response Act in a warm and caring way	Sometimes they are overwhelmed and come to me with their school-training conflicts – my job is to ask questions so they figure out themselves what to do. . . and meet them halfway.	Help them plan
		There are solutions to most problems, if one athlete tells you that he/she is exhausted and in pain, which typically happens at camp, you simply suggest that they do another exercise or rest whatever is hurting.	Problem solving activities
		One athlete had two weeks off training, and the first day back he complained about an important test and wanted to go home to study. We remembered the video and explained to him that he had not used his time off well enough and that we needed him back on the team.	Guidance to the right solution
		The school structure is also something they need to acknowledge and understand how to adapt to and coordinate as both a student and an athlete. We need to teach them that from day one.	Acknowledge and explain structure
2. Supportive behaviours	Show the athlete that you trust him/her Task related support (avoid judgement and criticism)	Athletes are responsible for their daily training as well as during vacations. We trust them. We ask the athletes to write their training log as a tool to them, not to control them.	Trust the athletes
	Use "you may", "what do you think about." (minimize overt control should, have to)	Our trust allows the athletes to take responsibility. My best athletes take the most responsibility for their own training.	Take responsibility
		It is hard to see athletes who do not take responsibility for their own training. Instead of using the independent time to train, they chill out. My reaction to this is unfortunately to become more controlling and reduce time for independent training.	Broken trust requires clear structure
		Sometimes, the athletes' initiatives need some guidance. One athlete had trained too hard and he needed us to help him plan differently.	Balance support and guidance
		There are consequences following broken rules. It is important to be very clear on the consequences of breaking rules. We have two athletes here who are on a short leash from partying during the season, something they know is breaking NTG code.	Clear consequences (NTG context and following structure)
3. Provide choice within specific rules and limits:	Clarifiy responsibilities Involve the athlete in decision and solution finding processes Give the athlete real choices	We involve our athletes in their long time development plans and short-time goals. Sometime they say they want to be the best, but they have no idea of what to do in the summer to reach their goals.	Explain to increase autonomy
		Instead of athlete involvement, I often end up giving them their plans,	Involve without response
		One of my athletes was coming back from injury asking for drills and exercises. Based on previous drills - he chose his own drills.	
		Some athletes spend three years here without accepting the responsibilities.	Do not accept responsibilities

(continued)

Table 1 *(continued)*

Need-Supportive Strategies (cf. Figure 1)	Description Explicit Skills From MAPS	Examples Coach Behaviours From Interviews	Learning Experience Following MAPS
4. Provide a rational for task, limits and rules – structure	Explain why you chose a specific exercise, tactic or rule Share knowledge about the sport	We start out each season by explaining the importance of all the different classic training sessions.	Information about training – maturity
		Sometimes you have to put your foot down. One athlete told me it is not possible to run the 3000 meter three days after a big graduation party, however, party hard is not about the school's values.	You have to set the structure
		It is a mistake to assume that the athletes understand the importance of training. They need an explaination for the reasons again and again. One often repeated question is why we do all the running.	Do not assuming they know
		The biggest challenge for us is when we explain why training is important, and they still do not believe you.	Not meaningful to the athlete
5. Allow athletes opportunities for initiative taking and independent work	Ask open questions Encourage initiative from the athletes	The athletes seem to get a little confused if I ask them what they think and their opinions. They get better with practice. The intervention made me more aware of how I can help them feel confident enough to take more initiative.	I can help the athletes feel confident in their decision making
		This is an important strategy. Previously I have not done this the way I should, I have been afraid of their knowledge or lack there-of to make good decisions	Afraid of too much initiative
6. Provide non-controlling competence feedback	Factual non-judgmental feedback about problems Positive feedback that convey high but realistic expectations	To find the right answer can be really challenging, and they want it immidiately. I have become aware that I need I need more think time before I respond.	Find solutions for competence feedback
	Target behavior that are under the athletes' control – optimal challenge.	I have turned around the way I give feedback from saying what they do wrong (you are too far in the back) to tell them what they do well (you did work great with the arms and upper body position)	Increase competence feedback
		Giving great informative feedback requires you to be aware, pay attention, and think before you speek. The clue is to find the right solution for the inquiry or feedback situation at hand.	Prioritizing focus areas
		Central to the interaction with athletes at competitions is to discuss with the athletes what might be important focus points, it is a two way process.	Feedback is a two-way process
7. Facilitate self-improvement focus (prevent ego-involvement)	Focus on self-improvement Focus on mastery and effort in the group Self-set goals Give attention to all the athletes regardless of if they are doing well or struggle.	It is much easier to ask them and focus on their own improvement when we work independently with athletes. On the roller-ski mill (treadmill for skis) for instance, I feel I have enough time to focus on self-improvement and also ask the athlete what her experience with or feeling about the technique is.	Situation dependent
		Every month we have independent meetings with all the athletes looking at their improvement and devel-opmental key points. We also discuss their technical and tactical and physical goals with them	Increase athletes' awareness on self-improvement
		It is easier to give group feedback when the group is doing well or showing effort in the task. Talking to the ones that need it the most is natural, though the athletes that perform well sometimes think they get too little focus.	Group dependent
		This is the most challenging strategy for me. When athletes get very disappointed, my solution is to ask them to mention three things they did well.	Help athletes re-focus
		Sometimes after practice I find myself reflecting that I did not really handle the interaction with that athlete well.	Increased coach self-awareness

structure when *focusing on self-improvement* by providing guidance for athlete development (Matosic et al., 2016; Skinner & Edge, 2002). Coaches are encouraged to *focus on mastery and effort in the group,* which can nurture the athlete's need for competence, and autonomy (Mageau & Vallerand, 2003; Tessier et al., 2010). Further, *self-set goals* help athletes experience success (Matosic et al., 2016; Taylor & Ntoumanis, 2007), rather than goals that are related to comparisons with others, which is risky. For each athlete to feel success and competent in their endeavors, it is important to *give all athletes attention, regardless of if they are doing well or struggle*.

A Short Presentation of MAPS

MAPS was designed with a consideration of three recurring elements of successful interventions, and use of multiple types of media to deliver the content (Su & Reeve, 2011). The first element consisted of group delivered information sessions in which basic tenets of SDT, types of motivation, and interpersonal style were presented. Second, coaches were presented empirical evidence for the adaptive outcomes associated with the supportive style. Third, every session in the intervention consisted of a section that was practice-oriented (group work activities, audio-visual clips, self-analysis). MAPS consisted of three workshops (two hours, two hours, one hour). Between the workshops, coaches had time for independent work with the digital workbook and continued experience-based learning to increase coaches' experience, so they could reach a higher level of leaning (Dreyfus & Dreyfus, 1986; Dreyfus & Dreyfus, 1980) throughout the intervention.

The Workbook

The participating coaches were presented with the digital workbook shortly after workshop 1. This workbook (34 pages) was available as an electronic media file and it was designed in line with the cognitive theory of multimedia learning to ensure coach learning (Mayer, 2009; Torgersen, 2012). The workbook content was divided into three parts. Part 1 explained postulates of SDT in the sport context: a) different types of athlete motivation; b) implications of motivational quality and motivational regulation; c) needs and the importance of need satisfaction; d) coaching styles and studies that demonstrate positive athlete outcomes from need supportive coaching. Part 2 presented the seven need-supportive coaching strategies: a) enumeration of the explicit coach behaviors; b) a video fragment that shows the practical application of the strategy in a sport context; c) examples of how they can use the strategy; d) implementation intentions; coaches were asked to think about how they can use the strategy in training and evaluate how it worked after training. Part 3 presented important determinants of need-supportive coaching: a) personal orientation; b) coaching context; c) perceptions of athlete behavior and motivation; and d) the complexity of coaching.

The Video Fragments

Each of the seven video fragments (1.37 – 3.18 minutes) starts with a description of a need-supportive coaching strategy and a sport specific scenario is described by a voice-over, as we see athletes practicing while music is playing in the background. Next, we witness a dialogue between a coach and an athlete or a monologue by the coach. The coach behavior in each scenario is shown in a need-supportive way ("good coach") as well as a controlling way ("bad coach"). The videos end with a reflection by one of the athletes of how it felt to be coached by a predominantly need-supportive coach versus a predominantly controlling coach.

Workshop 1: Multimedia Presentation

The content of the first part of the workbook is presented as a 45 minute multimedia presentation, followed by a 15 minutes break. After the break, need-supportive strategies are presented to coaches, and the video fragment for each strategy is shown.

Workshop 2: Presentation and Group Discussions

The main theme of workshop 2 is to present and discuss antecedents of need-supportive coaching. Workshop 2 starts out with a recap of workshop 1, followed by a power-point presentation (approximately 30 minutes) on determinants of coach behavior (the digital workbook part 3): personal orientation, coach context, perception of athlete motivation, and the complexity of coaching. Coaches are organized in two groups and are given a few minutes to discuss each determinant in turn. The groups exchange their thoughts. Next, the educator asks coaches to discuss each of the need-supportive strategies in their appointed groups and share their experiences. The final part of workshop 2 is a reflection session in plenum on two statements; one on the importance of quality of motivation for young elite athletes, the other on control versus support.

Workshop 3: One-on-One Sessions with the Educator

In the final workshop, the educator meets with each coach for about an hour inquiring about their experiences with using the need-supportive strategies.

Perceived learning experiences for successful need-supportive coaching. All coaches (n = 10) at one of the Norwegian College of Elite Sport (NTG) schools participated in the two-month long intervention. The coaches' working experiences ranged from no prior full-time coach experience to veterans with over 10-years of experience at NTG in addition to experience as a term national team coach (M = 5.4, SD = 4.35). Semi-structured individual interviews with the coaches were conducted at NTG and lasted between 49–64 minutes. The interviews focused on coaches' experiences with MAPS and their increased focus on need supportive behaviors by discussing their responses to the following questions: (1): how did you experience MAPS (workshop 1, 2 and 3), (2): To what extent did you use the digital workbook throughout the season? (3): To what extent have you (or not) changed the way you coach? (4): How could MAPS improve? (5): What was challenging? In the second part of the interview, a video-based method was used. Photo elicitation can be used in research to prompt responses and memory (Bryman, 2015; Harper, 2002; Pink, 2013). While watching each of the seven need-supportive videos, one at a time, the interviewer asked the coaches to think about examples of using "good-coach" and/or "bad-coach" strategies.

Rigor in the analysis process. Three strategies were used to establish rigor; thematic analysis, member reflection, and critical friends (Smith & McGannon, 2018). First, we used an abductive, semantic version of the six step guidelines for thematic analysis (Braun, Clarke, & Weate, 2016). Additionally, we e-mailed the coaches the article with their quotes. We received no corrections but many reflections on the content. The final strategy was to

discuss the themes and codes and the reflexive acknowledgement of multiple truths with colleagues and other coaches to capture different perspectives in the research process.

Transcription of the interviews resulted in 88 pages. The first author *familiarized* herself with the data by reading and re-reading the raw data and making notes. This was the first step in the thematic analysis (Braun, Clarke, & Weate, 2016). The extended version of the seven need-supportive strategies (Mageau &Vallerand, 2003) were used to organize the raw data, and, as the text was read *thoroughly,* interesting features related to experiences with need-supportive coaching were systematically coded across the data-set (phase two: generating initial codes). Relevant data to each code were gathered and arranged in the text, and the research team discussed and systematically organized codes into themes in phase three. The emerging *themes* relating to coaches learning experiences with MAPS were reviewed (phase four), before discussion with a colleague helped verify themes with a final naming in phase five. The analyses ended with three main themes describing coaches learning experiences (inductive characteristic of the TA process). The final step was to select appropriate extracts, and the coaches' quotes were then linked to the seven need-supportive strategies (see Table 1). Based on the three main themes of successful giving of need-support, two distinctly different coach stories emerged.

Impact of MAPS: Learning Experiences

Summarizing coaches' learning experiences with MAPS, strategy 1 (inquire about and acknowledge the athlete's feelings) was regarded very important by all the coaches and requires coaches to *spend time* with each individual athlete. Strategy 2 (supportive behaviors) seemed to be difficult for some coaches due to a lack of trust in their athletes. Coach learning experiences with strategy 3 (provide choice within specific rules and limits) showed the importance of involving the athletes. Both for strategy 2 and 3, a gradual approach was recommended when athletes learn to make decisions and find solutions in their developmental process. Strategy 4, to provide rationales to the athletes, was considered both challenging and important to develop. However, it was frustrating for several of the coaches to have to repeat themselves when explaining the "training is important" message to their athletes. Each situation and activity needs to be explained for a gradual development to take place. To be able to let go (strategy 5), was closely related to insecurity about the athletes' actual knowledge level and very sport specific. There was quite a range among the coaches' experiences with the program, depending of the sport, knowledge level, and maturity in their own development. The last two strategies were regarded central to coaching by all the coaches as they increase athletes' awareness of self-improvement. Finding enough time to invest in all athletes was a challenge. Based on this we suggested three dimensions for successful giving of need-support to athletes that will be discussed below: time for each athlete, gradual approach, and carefully considering each specific situation.

Discussion and Implications

Two Contradictory Stories Illustrating Coaches' Learning Experiences

Two collective narratives (Clandinin & Connelly, 2000) are presented to illustrate coaches' learning experiences with need-supportive strategies. The findings revealed a continuum of coach experiences from MAPS and the seven strategies, and the two narratives illustrate, three important dimensions for successful need-support. Coach 1 represents a coach-athlete interaction that is characterized by understanding and trust, while coach 2 tries out need supportive coaching with a non-understanding and resisting athlete.

Independent time with each athlete. For the coaches, the time spent with each individual athlete was a major factor in effective need-support, and it required commitment to invest sufficient time with each individual athlete. As coach 1 noted (strategy 7):

> It is much easier to ask them to focus on their improvement when we work independently with athletes. On the roller-ski mill (treadmill for skis) for instance, I feel I have enough time to focus on self-improvement and ask the athlete what her experience with or feelings about the technique is.

MAPS had taught him a lot about *how* to give feedback in such situations. Despite that, coach 1 found it beneficial to have some "think time" before suggesting a solution to the challenge or inquiry at hand. This is because he had become more aware (intrapersonal) of his athletes' focus areas and how they evaluated the feedback, consequently, he wanted to streamline the feedback to each athlete. This also meant that coach 1 felt he had to be aware of the athlete's developmental process and spend enough time before each session with the athlete to "discuss what is the goal of the session, both technical and physically, which makes it much easier for me to talk about it later" (strategy 6). As the athlete learns and responds positively to the feedback, coach 1 also increases his effort.

In contrast, coach 2 who is generally dealing with athletes who lack understanding of the importance of training reported the process of offering competence feedback as more challenging (strategy 6 and 7). Even when prioritizing one-on-one time with athletes, discussions about development did not pay off, at least not at the time of the interview. For example, coach 2 added the following anecdote about athletes' lack of understanding about how to develop as snowboarders:

> Two weeks ago, the athletes told me how important it was to practice in powder snow for their development and asked us to take them to an area with snow. After planning the trip, they did not want to come because they rather wanted to be at their home mountain practicing. Then they simply argued that practicing in powder snow would not help them become great snowboarders. This constant inconsistency in what they think helps, might be reduced with more discussions and what we learned from the program. However, this is time-consuming, challenging and we can hardly feel the progress.

The above example is all about involving athletes in the developmental process and making athletes commit to decisions. For example, last summer coach 2 did not ask about one of his athlete's summer-plans, and as a result, the summer training for this athlete was less than ideal. Through this experience and with the knowledge from MAPS, he had learned to inquire (strategy 1) better and involve the athlete in decision and solution finding processes (strategy 3) about his athletes' summer plan before they start the collective planning for next summer:

> I think this year it is important that I ask her about her family's vacation plans before we plan so I can adjust to her current condition and summer plans with her family. I want her to tell

me about her summer plan first, then she can suggest a plan for the summer, then we can make small adjustments and suggestions if we find it necessary.

Gradual approach. In the interviews, the coaches emphasized that they felt their athletes developed gradually, and as a result, their need-supportive behavior had to target the athletes as they were in that present situation. Hence, MAPS had raised the coaches' awareness of the fact that successful need-support is a gradual process. Following this line of thought, both coach 1 and 2 admitted that the first-year students at the elite sport school have yet to learn about physical, mental, technical and tactical development in their sport. The information about athletes' knowledge and understanding is important when considering the typically autonomy-supportive strategies; how to provide choice and involve the athletes (strategy 3), what to expect of athlete decision-making (strategy 2 – trusting the athlete and strategy 5 allow athletes opportunities for initiative taking and independent work), and sharing knowledge about the sport (strategy 4).

Coach 1 reflected that the best athletes are the most independent, they are better at taking responsibility and they are more "involved in their own development" (strategy 3). For instance, coaches need to let the athletes develop the skills they need to become autonomous in their own athletic development: "When we have individual meetings, we let them take charge and come with ideas. You can always come up with suggestions if they are really way of." The gradual approach will help athletes understand what is needed to take responsibility. As explained by coach 1: "The second and third year students mainly draft their own summer plan, we read it and together we revise the plan". This shows how when adapting a gradual approach and using the strategy (strategy 3 and 4), the athletes can take responsibility for their own training.

While coach 1 was having mature need-supportive discussion with autonomous athletes, *how* to develop different skills and be involved in their athletic development was at a completely different stage for coach 2. His starting point was: "they first of all need to learn what constitutes a good decision." Athletes with limited knowledge of the training process are likely to also lack understanding about, and thus not benefit from, need-supportive coaching. One classic example mentioned by coach 2 was the withdrawal of athletes' opportunity for individual training sessions in the fall: "We see that the level of understanding is too low, so to ensure quality of the physical training, we need to have as few individual sessions as possible" (not using strategy 2 and 3). With the tools from MAPS, coach 2 now admitted that he would need to start a gradual transfer of responsibility and increase the athletes' understanding of what is beneficial or not for them to do (strategy 4). He also admitted that he did expect them to already have this information at this level. To reach this goal, they now offer Tuesday-speeches on training for their athletes: "National team coaches and athletes, other experts on different topics were brought in to explain to our athletes the importance of training".

In addition to these lectures, coach 2—just like coach 1—also tried to involve his athletes more in planning: "We try to involve the first-year student, but they do not really know what it means to be involved. So if you give them too many choices and decisions to make, they chose to take a break instead of doing what they can" (strategy 3). Through his learning experiences with the need-supportive strategies, workshops, and group discussions, coach 2 felt he had some tools to let go of his control and better practice a gradual approach to athlete development. When an athlete returned to on-snow training after injury and asked for drills, coach 2 started his gradual approach to initiative taking (strategy 5): "I asked him to think about drills he had used previously in practice. It was great when he chose his own drills".

Unfortunately, coach 2 wondered if they had in fact become more controlling throughout the season because the athletes' inability to earn their coaches' trust (strategy 2) and make good decisions (strategy 3). This made coaches struggle with need-support:

> When our athletes are given the opportunity to take responsibility for their own on-snow training, and they have the opportunity to use the rails and practice different jumps without taking it, we simply have to decide for them. We explain to the athletes that we need them to be in the same park so we can give them feedback, but unfortunately, we end up with the same scenario and discussion the following day.

After attending MAPS, both coach 1 and 2 highlighted their new awareness on the importance of a gradual approach, although coach 2 experienced this as much more challenging than coach 1.

A careful consideration of the specific situation. Both coach 1 and coach 2 noted that the use of need-supportive strategies was dependent on the situation at hand. Coaches are presented with a variety of situations ranging from everyday practice, school demands on their athletes, coaches' context demands on them, competition settings, group dynamics, the elite sport school context, national sport cultures, and so on. Coach 1 explained how he had to think about each situation to give the appropriate feedback (strategy 7). If an athlete starts to become uncertain about what to focus on during competition, he had to find a way to talk to the athlete, so he could focus on self-improvement: "I take the time to discuss what they need to keep their focus on in a specific situation."

However, simply using non-controlling competence feedback strategy is not always as easy as it sounds (strategy 6). The complexity of the situation influences the kind of feedback athletes need. Coach 2 perceived it as difficult to give feedback and attention to all the athletes (strategy 7). He used an example from the competition context:

> Athletes react differently when failing, some want to talk but others prefer distance from me. It is individual when it is the right time to try to comfort them or give feedback. Because of this, I am better at giving feedback to the athletes who succeed. Before I found it hard to know when the right time for feedback is for the ones who fail. For example, it is not easy to find positive competence feedback if they ski out in the fifth gate. But you can say 'You really went for it out of the start.'

Summing up, the coach reflections reflect the need for coaches to develop an understanding for the three dimensions that determine the success of coach need-supportive behaviors, which in turn may be central to athletes' autonomous functioning and well-being. As seen from the examples illustrated in this discussion, athletes need to learn to "understand" what is needed to excel at the elite level. Athlete understanding is also important for how the coaches use the need-supportive strategies.

Conclusion

The impact evidence of learning experiences from MAPS, a theory-informed coaching development program, conveys that MAPS is helpful in teaching coaches about need-supportive skills

at the intrapersonal (awareness of own coaching practice) and interpersonal (interaction with athletes) level. However, a successful implementation of need-supportive coaching also depends on the time one has for the individual athlete, a gradual approach of learning and autonomy, and a careful consideration of the specific situation. The test trial of the program revealed that MAPS is more successful with mature athletes (3rd year with an extensive knowledge of development) than with athletes who lack understanding both for development and why (how) to take initiative, be involved, and take responsibility for their own development (autonomy). The program needs to be revised to help coaches to be need-supportive for the latter group as well. As a final recommendation for future research, coach education developers and sports organizations should take into consideration athlete maturity to better optimize the program for different sports and age.

Author Biographies

Hedda Berntsen is a PhD-scholar at the Norwegian School of Sport Sciences. She has written three books, several chapters and chronicles, given speeches at international conferences and national sport federations. She has contributed to develop learning material for The Norwegian Ski Federation, and educating coaches. She is a former elite athlete with an Olympic silver medal in Ski Cross, World Champion Telemark skier, and bronze medalist in Alpine skiing.

Elsa Kristiansen is a professor at the University of South-Eastern Norway. She has published over 50 articles and book chapters in the areas of sport psychology (e.g., motivation, coping with stress, youth athletes) and sport management (e.g., volunteerism, YOG, event management, talent development). She was also a lecturer at one of the Norwegian top sport colleges for ten years.

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Article 3

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Abstract

The aim of this study was to explore how coaches' behaviour affected athletes' well-being by examine: (a) the potential change in perceptions of need-support from the coach (over an academic year), and (b) the within-person relationship between the three aspects of need-supportiveness and subjective vitality at the end of the academic year. 102 youth elite student athletes completed ta questionnaire three times. Bayesian growth curve analyses showed that the levels of relatedness and autonomy support were stable and high throughout the year. In contrast, competence support decreased during the season. In addition, the results showed a credible positive within-person relationship between changes in all three facets of need-supportiveness from the coach and vitality measured at the end of the season which support SDT tenets. These findings indicate the importance of need-support for athletes' wellbeing, and that competence support needs extra attention in the elite sport context where the competence need is constantly challenged.

Keywords: athlete well-being, need-supportive coaching, elite sport school context, successful coaching.

1. Introduction

"Successful athletes with controlling coaches are proof that being controlling is a good motivational strategy" is a typical counter argument when discussing the importance of need-supportive coaching. Controlled motivation can indeed be a very powerful motivation, especially when self-worth is on the line (Ryan & Deci, 2017). At least for some, however, this "evidence that control works" fails to mention that the need undermining style (controlling style) has its costs (Adie, Duda, & Ntoumanis, 2012; Balaguer et al., 2012; Cheval, Chalabaev, Quested, Courvoisier, & Sarrazin, 2017). In fact, *both* controlling social contexts and supportive social contexts can produce medal winners. The critical difference between these two pathways to elite sports is the *well-being* of the athletes operating within them. Research supports the often observed costs from controlling coaches such as general ill-being (Cheval et al., 2017), burn-out (Balaguer et al., 2012; Healy, Ntoumanis, van Zanten, & Paine, 2014), maladaptive coping (Bartholomew, Ntoumanis, Ryan, Bosch, & Thogersen-Ntoumani, 2011), and disaffection (Curran, Hill, Hall, & Jowett, 2014), whereas the autonomy-supportive coaching style is associated with athlete well-being (Adie et al., 2012; Balaguer et al., 2012; Bartholomew, Ntoumanis, Ryan, & Thøgersen-Ntoumani, 2011; Bartholomew, Ntoumanis, Ryan, Bosch, et al., 2011; Cheval et al., 2017; González, Tomás, Castillo, Duda, & Balaguer, 2017; Healy et al., 2014). In this study with young aspiring athletes, we conceptualize psychological well-being in terms of flourishing, a combination of feeling good and functioning effectively (Ryan & Deci, 2017) when investigating changes in need-supportiveness and its association to well-being over a competitive season at an elite sport school. A fully functioning/flourishing individual can mobilize and harness psychological and physical energy to pursue valued activities and experience a sense of spirit, enthusiasm, and psychological well-being (Ryan & Deci, 2008). Little is currently known

about the longitudinal change in coaches need-support over a season at an elite context, nor is the assessment of each of the constructs of nee-support.

1.1 The context of the present study

Understanding athlete well-being can contribute to the design of social environments that foster athlete well-being and secure athletes' well-being as they aim for elite performances. The present study was executed at a school that belongs to a non-profit private foundation called *The Norwegian College of Elite Sport* (hereafter NTG). Elite sport schools in Norway are important stakeholders for talent development (Kristiansen & Houlihan, 2017). NTG currently runs six schools with 990 students participating in 27 different sports (NTG, 2018). Current and former NTG athletes have achieved considerable success, accumulating around 600 national championship gold medals, 175 world championship medals, and 26 gold, 17 silver, and 21 bronze medals in the Olympics (between the 1992 and the 2018 winter Olympics) (NTG, 2018). For many young athletes, NTG is a stepping-stone for national and professional sports as they aim to prepare the student athletes for future careers as international elite athletes (and medal winners) and for higher education. Despite this dual goal of athletic excellence and academic development, athletes and coaches are predominantly measured by their performance and ranking at championships. The school is considered one of the best in Norway for winter sports (Berntsen, Lemyre, & Røe, 2014), and both athletes and coaches may experience pressures over a season. Coaches may experience pressures from the school to live up to the elite status of the school. Athletes may experience pressures from parents' expectations related to the resources they put into their youth's elite sport endeavours and her or his need to make (or maintain a place in) junior national teams, national teams; and from coaches and other teammates about performance, to name a few.

1.2 Self-Determination Theory

Self-Determination Theory (SDT) explains how social conditions facilitate or hinder human flourishing (Deci & Ryan, 1985, 2000; Ryan & Deci, 2017). The three basic psychological needs of *autonomy, competence,* and *relatedness* are essential to optimal functioning and growth, integrity, and well-being (Ryan & Deci, 2000). The psychological need for autonomy refers to the need to perceive one's actions as reflectively self-endorsed. The psychological need for competence is met when one feels that one interacts effectively and confidently with the environment. The relatedness psychological need is satisfied when one is feeling cared for, connected to others, and when experiencing a sense of belonging (Ryan & Deci, 2017).

Basic Psychological Needs Theory (BPNT), the fourth of SDTs six mini theories, proposes that satisfaction of the three needs is facilitated by autonomy-support – a predictor of all three basic psychological needs (Ryan & Deci, 2017). For instance, for athletes to feel competent it is critical that their actions are perceived as self-organized or initiated—in other words, they feel ownership of the activities that they succeed in (Deci & Ryan, 1985). Autonomy is fundamental for competence. The psychological needs for relatedness and competence depend on the person's capacity and freedom to self-organize (Ryan & Deci, 2017). Hence, autonomy-support is a critical aspect of a need-supportive environment (Ryan & Deci, 2017), also for young talents within a structured sport school context. Autonomy supportive behaviours have shown to simultaneously support more than one psychological need. This has been referred to as the multiple-needs effect, that is, autonomy-support satisfies all the psychological needs. The multiple psychological needs-effect has been observed in correlational studies (Adie, Duda, & Ntoumanis, 2008; Adie et al., 2012; Amorose & Anderson-Butcher, 2007; Gagné, Ryan, & Bargmann, 2003; Hodge & Lonsdale, 2011; Pelletier, Fortier, Vallerand, & Briere, 2001), longitudinal correlational studies (Adie et

al., 2012; Pelletier et al., 2001), and in intervention-based studies (Cheon, Reeve, Lee, & Lee, 2015; Cheon, Reeve, & Ntoumanis, 2018). SDT is based on the idea that support for all three psychological needs leads to increased need-satisfaction (Deci & Ryan, 2000). Autonomy-support has received most empirical attention to date (Cheon et al., 2018; Rocchi, Pelletier, & Desmarais, 2017). Even though a multiple need effect is associated with autonomy-support, the importance of support for all three needs specifically has received little attention. For instance, it has been suggested that need-supportive behaviours include autonomy support that is accompanied by structure and interpersonal involvement (e.g., Mageau & Vallerand, 2003; Matosic, Ntoumanis, & Quested, 2016; Taylor & Ntoumanis, 2007). Athletes may benefit from a well-structured sport context and the presence of high interpersonal involvement, as shown in the physical education context (Jang, Reeve, & Deci, 2010; Tessier, Sarrazin, & Ntoumanis, 2010).

Tessier et al. (2010) argue that interventions need to feature an explicit focus on both competence support and relatedness support to use the terminology *need supportive*. Mageau and Vallerand (2003) showed in their motivational model of the coach-athlete releationship that autonomy-support encourages the satisfaction of all three basic psychological needs, additionally, structure instilled by coach encourages the satisfaction of athletes' perception of competence, and a coach's involvement encourages athlete perception of relatedness. Both competence support and interpersonal involvement have an important role as relatedness support in addition to the relatedness supportive aspects of autonomy-support.

1.3. Coaching in the elite sport school context

There is currently a limited empirical base on coach education research and even less so in the elite sport context. In a study by Cheon et al. (2015), the intervention group of coaches received training in the autonomy-supportive style. Afterwards, their athletes perceived them as somewhat more autonomy-supportive, and they generally maintained

measures of motivation, engagement, and functioning over eight weeks. In contrast, the athletes of the coaches who did not receive the autonomy-supportive training program perceived their coaches to become somewhat less autonomy-supportive, and experienced deterioration in all measures. The intervention results led Cheon et al. (2015) to conclude that enacting an autonomy supportive coaching style functions as an antidote to a controlling coach style. Coaches with athletes competing in high-stake sport competitions tend to adopt maladaptive coaching styles (Cheon et al., 2015) as "elite contexts can often involve more pressure toward winning, which can readily translate into more controlling styles" (Ryan & Deci, 2017, p. 496). These examples of situationally induced coach behaviour show how coaches' interpersonal style is contextual.

Rocchi and colleagues (2013) confirmed that coaches tend to act less autonomy-supportive towards their athletes when perceiving pressure from above (e.g., administrators) or from below (e.g., athlete disengagement). This is in concert with two (of three) of Mageau and Vallerand's (2003) determinants of coach behaviours as found in their coach-athlete motivational model. First, coach context or pressure from above is the pressure the coach feels to perform, which can in turn lead her or him to pressure athletes to perform. Secondly, coaches' perceptions of athlete motivation and behaviour (pressure from below) can influence coach controlling behaviours towards athletes. If coaches perceive their athletes as lazy and unengaged, then they tend to pressure athletes and downplay the motivation they wish to see. Thirdly, coaches' beliefs about what represents good coaching will likely influence the ways in which they behave towards their athletes, consequently, the elite competitive contexts can pressure coaches toward a maladaptive controlling style, which can reduce their need-support and thus need-support is at risk in the elite context. Unfortunately, athletes and coaches operating in competitive contexts experience a great deal of pressure—the higher the stakes,

the more pressure to win (Fortier, Vallerand, Brière, & Provencher, 1995; Reeve & Deci, 1996; Ryan & Deci, 2017).

1.4. The competence psychological need in the sport school contexts

Rivalry and constant competition between athletes are a big part of the elite sport school context. Competitive settings can offer opportunity for skill development or mastery at drills and exercises and strengthen intrinsic motivation *or* foster controlling aspects such as comparing athletes to each other and undermining intrinsic motivation (Ryan & Deci, 2017). Research on intrinsic motivation has shown that when participants lose in competition their intrinsic motivation often suffers, largely through diminished feelings of the competence need (Ryan & Deci, 2017). Vansteenkiste and Deci (2003) found that when offering positive competence feedback to athletes who had lost, their intrinsic motivation was higher than athletes who lost but did not get this kind of feedback. In the same study, Vansteenkiste and Deci found that receiving a monetary reward following a win counteracted the positive aspect of winning because it was perceived as controlling. These findings are important for athletes in the elite school context, considering they often receive prices in the form of trophies, money, or material goods (e.g., bags, clothes, goggles, skis, snowboards). On top of these tangible rewards, athletes are subject to performance-contingent rewards (e.g., ranking) (Ryan & Deci, 2017). Indeed, reward systems are a big part of athletes' lives (Treasure, Lemyre, Kuczka, & Standage, 2007).

SDT is based on the idea that need-supportive coaching is equally important at all levels of sports (Ryan & Deci, 2017). At the top level of youth elite sport, there is an intense competition schedule, and we expect athletes' competence need to suffer, even when coaches offer positive competence feedback.

Based on the theoretical framework discussed above, we hypothesized that elite competitive contexts can pressure coaches toward a maladaptive controlling style and that

need-support is at risk in the elite context. However, there is scant literature in sport and exercise psychology on *change* (Stenling, Ivarsson, & Lindwall, 2017), and there is limited longitudinally research on assessment of and change in the three constructs of the need-supportive style in an elite sport school context. This leaves us with a limited understanding of need-supportive behaviour in the elite context, and how it affects athletes' well-being.

1.5. The present research

The aforementioned concepts of need-supportiveness (predictor) and well-being (outcome) can be located on either side of the complete SDT causal sequence (Fortier, Duda, Guerin, & Teixeira, 2012; Grouzet, Vallerand, Thill, & Provencher, 2004; Vallerand, 1997; Vallerand, Fortier, & Guay, 1997; Vallerand & Losier, 1999). A fair number of studies have tested the basic psychological needs theory (Deci & Ryan, 2000) and examined the relationships of coach interpersonal style – need-satisfaction and athlete well-being longitudinally (Balaguer et al., 2012; Cheval et al., 2017; González et al., 2017). The focus of these investigations has mainly been on the mediating effect of need-satisfaction. The lack of longitudinal studies investigating need-support and the three aspects of it may be due to scales being inappropriate for evaluating all aspects of need-supportive coaching (see 2.5).

The current study's main purpose was to examine (a) the potential change in need-supportiveness throughout a season and (b) if change in need-supportiveness could predict perceived vitality at the end of the end of the season. We hypothesized that coaches in elite sport schools may become less supportive towards their athletes throughout the season due to pressure from above and below. Further, it was hypothesized that athletes might need even more competence support throughout the season because of the pressure they face in training and races throughout the year. It was anticipated that coach interpersonal style that is perceives to support autonomy, competence, and relatedness enhance athlete vitality (Ryan & Deci, 2008; Ryan & Deci, 2017).

2. Method

2.1. Participants

The 102 student winter sport athletes (age 16-18, Male=70, Female=32, *M* age= 17.04, *SD*= 0.87) at NTG answered validated questionnaires to assess their perception of their coaches' need-support and their well-being at three times points over a year (beginning, middle, end). Athletes represented five winter sports: Freeskiing (n=5), Snowboarding (n=12), Alpine Skiing (n=17), Cross-Country (n=31) and Biathlon (n=34). The ten coaches 25-54 years (Male=9, Female=1, *M* age=36.4, *SD*= 9.167) at NTG working experiences ranged from no prior full-time coach experience to true veterans with over 10-years of experience at NTG (*M* = 5.4, *SD* =4.35).

2.2. Procedure and Design

The Norwegian Centre for Research Data (NSD; the Norwegian ethics board) approved the project prior to the data collection. Athletes and parents gave informed consent for participation in the project. The facilitator administered the questionnaires to the athletes in their classroom, which created consistency for athletes and coaches. Temporal precedence is an issue relevant for internal validity. The study had a longitudinal design and therefore influenced by time. At each measurement time, the athletes were asked to report on coaches' typical behaviour in coach led training-sessions over the last few weeks (so that we can assess the change), and last seven days for subjective vitality. Thus, both assessments were at the state level.

2.3. The measurement package

The main focus of our investigation is the change in need-supportiveness, and the unique impact of coaches' need-support on athletes' subjective vitality. Hence, we measured the predictor (need-support) and the outcome (subjective vitality) of the full SDT- process sequence, neither incorporating need-satisfaction nor sport motivation in our analysis.

However, one limitation of research into athletes' perceptions of coaches' interpersonal styles has been the lack of a valid measure, and unfortunately, *Interpersonal Behaviours Style* in sport was published after our study's start (Rocchi et al., 2017). Previous researchers have used different scales to assess the coach interpersonal style by assessing mastery, social support (relatedness), and autonomy-support separately (Reinboth, Duda, & Ntoumanis, 2004), or only used autonomy-support to assess coaches' interpersonal style (Balaguer et al., 2012; Cheval et al., 2017; González et al., 2017).

In the absence of one validated scale to assess coach autonomy-support, competence-support, and relatedness-support, we translated the *Questionnaire of Basic Psychological Needs Support* to Norwegian and adapted it from the Physical Education (PE) setting to the sport setting. The first author started out translating the scale to English, as well as making the adaptions from PE to sport. In this process, the first author made sure that it was a proper content replacement. Next, an English language expert proof-read the translation. Finally, a colleague with theoretical expertise knowledge in SDT, as well as the context of youth sport, and who is fluent in both languages, worked through the translations sending a final version back to the first author. The questionnaires were prepared to assess the measures at the state level, as we were interested in the athletes' perceptions of subjective vitality and perceptions of coach behaviour, in the elite sport domain over the last week.

2.3.1. Questionnaire of Basic Psychological Needs Support (QBPNS)

Athletes' perceptions of their coaches' interpersonal need-supportiveness were assessed by the Norwegian version of Questionnaire of Basic Psychological Needs Support (QBPNS) (Sánchez-Oliva, Garcia-Calvo, Sánchez-Miguel, Amado, & Ntoumanis, 2013). The 7-point Likert scale consists of 12 items (1=completely disagree, 4=moderately agree, 7=completely agree). Athletes were asked to answer 12 different statements following "During practice, my coach...." (e.g. encourages our ability to carry out the task well). In contrast to other scales

assessing coach interpersonal styles, the QBPNS takes into consideration all three needs and evaluates athletes' perception of their coach's behaviour in terms of supporting the need for autonomy, competence, and relatedness. This was important for the current investigation, in addition to using a scale to provide insight into situationally induced and changing coach behaviour and the following fluctuations. We assessed need-support, at the state level as stated in the questionnaires, as "over the last few weeks."

2.3.2. Subjective vitality

Athletes' well-being was assessed using the subjective vitality scale (Ryan & Frederick, 1987) with a 7-point Likert scale consisting of seven items (1=not at all true 7=very true). Athletes were asked to what degree the different statements were true for the last seven days (state level) e.g., "I feel alive and vital." In SDT the definition of well-being goes beyond hedonic outcomes such as happiness and is conceptualized in terms of full functioning (Deci & Ryan, 2017). The rationale behind choosing subjective vitality as an indicator of athlete well-being (wellness) is that vitality is a state of being fully functioning or thriving by SDT (Ryan & Deci, 2017; Ryan & Huta, 2009). Vitality is theorised to be the most general characteristic of a fully functioning person as it reflects organismic wellness (Ryan & Deci, 2017). Vitality is defined as "one's conscious experience of possessing energy and aliveness" (Ryan & Frederick, 1997, p. 530). Vitality pertains to a sense of having energy available to the self, to be used in volitional ways--not just being in a state of arousal. The extent to which athletes experience their energy as *their own* corresponds with their sense of vitality (Ryan & Frederick, 1997).

2.4. Data analyses

All analyses were estimated with use of a Bayesian approach. One of the main differences between the Bayesian statistical approach and the more traditional frequentist approach is that it is based on different statistical assumptions (for more information see, for

example, Stenling, Ivarsson, Johnson, & Lindwall, 2015). In comparison to the frequentist approach, the Bayesian approach has a better likelihood of producing reliable estimates with small sample sizes (Song & Lee, 2012). More specifically, due to the less restrictive distributional assumptions the normality assumption does not need to be fulfilled to perform the analyses within the Bayesian approach (Yuan & MacKinnon, 2009).

We calculated descriptive statistics using JASP software package (Love et al., 2015). We applied Bayesian correlation analyses to investigate the relationships between the study variables. For each of the pair-wise comparisons a Bayes Factor (BF) was calculated. In line with previous recommendations, a BF above 10 was determined to be in strong support of the alternative hypothesis (i.e., there is a statistical relationship between the two variables; Etz & Vandekerckhove, 2016).

To test the potential change in all three basic need support (i.e., autonomy, competence, and relatedness) variables over the three measurement waves, we estimated unconditional latent growth curve (LGC) models in Mplus 8.0 (L. Muthén & Muthén, 2017) using the Bayesian estimator. For more information about the LGC analyses see, for example, Stenling et al. (2016).

To test whether changes in each of the basic psychological need support variable were associated with the level of subjective vitality in the end of the season (T3), three conditional LGC analyses were performed, one for each of the basic need support variables. In all three models, subjective vitality was regressed on both the intercept (i.e., initial level of basic need support at T1) and slope (i.e., change trajectory of the basic need support over the three measurement waves) parameter. To control for the potential influence of subjective vitality, measured at T1, on subjective vitality, measured at T3, an autoregressive effect was specified between these variables. Also, a correlation between subjective vitality and the basic need support, both measured at T1, was specified.

In the analyses we used the Markov Chain Monte Carlo simulation procedures with a Gibbs sampler. For all analyses we performed 200,000 iterations. In line with previous recommendations a potential scale reduction factor around 1 was considered evidence of convergence (Kaplan & Depaoli, 2012). We assessed model fit using the posterior predictive *p* (PP*p*) value and its accompanying 95% confidence interval. In Mplus "the 95% confidence interval is produced for the difference in the *f* statistic for the real and replicated data. A positive lower limit is in line with a low posterior predictive *p* value and indicates poor fit" (Muthén & Asparouhov, 2012, p. 315). Default priors were used for all models.

We estimated credibility interval (CI) for all parameters estimated within the models. In comparison to the more traditional confidence interval the credibility interval indicates, the probability (e.g., 95%) that the parameter of interest, given the observed data, lies between the two values. The recommendations from Zyphur and Oswald (2015) were followed meaning that we rejected the null hypothesis if the 95% CI did not include zero.

Mean and variance priors for the change in basic psychological need support and structural parameter estimates (i.e., the path between change in basic psychological need support and subjective vitality measured at T3 were used in the analyses). The prior for change in psychological need support, specified in both the unconditional and conditional models, was obtained from Cheon et al. (2015). The prior for the relationship between change in psychological need support and subjective vitality, measured at T3, came from Stenling, Lindwall, and Hassmén (2014).

Sensitivity analyses were performed for each estimated model to investigate if changes in the prior variances (i.e., .001, .01, and .10) influenced the results. To compare these three models the deviance information criterion (DIC) was used. More specifically, a lower value indicated a better-fitting model (Asparouhov, Muthén, & Morin, 2015). The prior setting that

showed best fit to data for the unconditional latent growth curve models were also applied for the change parameter in the conditional latent growth curve models.

3. Results

3.1. Descriptive statistics

Table 1 shows the means, standard deviations, ranges, skewness value, and reliability for all variables. In general, relatively high levels of internal consistency (Cronbach's alpha) were found. Participants reported high levels on relatedness support, competence support, autonomy support, and subjective vitality. The descriptive statistics suggest that athletes overall perceived their coaches to support their basic psychological needs and they experience high levels of subjective vitality. For descriptive statistics, see Table 1.

Table 1

Descriptive statistics and correlations.

Variable	M (SD)	1	2	3	4	5	6	7	8	9	10	11	12
1. Aut T1	5.44 (0.75)												
2. Aut T2	5.52 (0.89)	0.02											
3. Aut T3	5.33 (1.17)	0.01	0.63*										
4. Comp T1	6.42 (0.55)	0.42*	0.21	0.13									
5. Comp T2	6.21 (0.74)	-0.05	0.73*	0.47*	0.32*								
6. Comp T3	5.98 (0.86)	-0.09	0.61*	0.76*	0.29	0.59*							
7. Rel T1	6.31 (0.66)	0.52*	0.18	0.07	0.66*	0.27	0.17						
8. Rel T2	6.30 (0.72)	0.03	0.59*	0.38*	0.35*	0.82*	0.58*	0.47*					
9. Rel T3	6.15 (0.77)	0.02	0.56*	0.56*	0.28	0.64*	0.73*	0.26	0.63*				
10. Vit T1	5.25 (0.84)	0.13	0.43*	0.33*	0.34*	0.47*	0.36*	0.31	0.42*	0.31			
11. Vit T2	5.19 (0.96)	-0.01	0.50*	0.53*	0.19	0.47*	0.50*	0.22	0.38*	0.39*	0.48*		
12. Vit T3	4.97 (1.10)	0.13	0.24	0.29	0.12	0.22	0.36*	0.11	0.19	0.29	0.41*	0.53*	

Note: Aut = Perceived Autonomy Support; Comp = Perceived Competence Support; Rel = Perceived Relatedness Support; Vit = Subjective Vitality; T1 = Measured at time 1; T2 = Measured at time 2; T3 = Measured at time 3.

* BF > 10

3.2. Unconditional latent growth curves

The results from the unconditional latent growth curves are presented below.

3.2.1. Autonomy.

The sensitivity analyses showed that the model with a weak variance prior (i.e., .1) showed, in comparison to the two other models, best fit to data (for DIC values see Table 2). The model showed good fit to data (PP*p* = .46, 95% Confidence Interval = [-11.93, 11.77]). The model had a credible intercept (5.46, 95% CI = [5.31, 5.61], but there was no credible change over time (Δ = -.05, 95% CI = [-.18, .09]. The variances for both the intercept (Ψ = .09, 95% CI = [.01, .30] and the growth trajectory (Ψ = .32, 95% CI = [.17, 51] were both credible.

3.2.2. Competence

The sensitivity analyses showed that the model with a weak variance prior (i.e., .1) showed, in comparison to the two other models, best fit to data (for DIC values see Table 2). The model showed good fit to data (PP*p* = .60, 95% Confidence Interval = [-13.43, 12.53]). The model had a credible intercept (6.40, 95% CI = [6.28, 6.51], and a credible decline over time (Δ = -.20, 95% CI = [-.30, -.10]. The variances for both the intercept (Ψ = .15, 95% CI = [.04, .31] and the growth trajectory (Ψ = .13, 95% CI = [.06, 22] were both credible.

3.2.3. Relatedness

The sensitivity analyses showed that the model with a weak variance prior (i.e., .1) showed, in comparison to the two other models, best fit to data (for DIC values see Table 3). The model showed good fit to data (PP*p* = .44, 95% Confidence Interval = [-10.44, 12.52]). The model had a credible intercept (6.33, 95% CI = [6.18, 6.47], but no credible change over time (Δ = -.08, 95% CI = [-.17, .02]. The variances for both the intercept (Ψ = .31, 95% CI = [.16, .52] and the growth trajectory (Ψ = .14, 95% CI = [.05, 23] were credible.

Table 2

Comparison of parameter estimates of using different priors in the unconditional models

	Prior Mean	Model A	Model B	Model C
Autonomy Support				
Intercept	NA	5.43 [5.28, 5.63]	5.37 [5.23, 5.49]	5.46 [5.31, 5.61]
Change	.16	0.02 [-0.10, 0.14]	0.13 [0.07, 0.19]	-0.05 [-0.18, 0.09]
Variance Intercept	NA	0.10 [0.01, 0.31]	0.10 [0.01, 0.33]	0.09 [0.01, 0.31]
Variance Change	NA	0.32 [0.17, 0.52]	0.35 [0.18, 0.55]	0.32 [0.17, 0.51]
PPp (95% CI)		0.41 [-11.63, 15.11]	0.17 [-7.33, 19.80}	0.46 [-11.03, 11.77]
DIC		678	682	677
Competence Support				
Intercept	NA	6.37 [6.25, 6.48]	6.27 [6.14, 6.40]	6.40 [6.28, 6.51]
Change	0.16	-0.14 [-0.22, -0.05]	0.07 [0.01, 0.13]	-0.20 [-0.30, -0.10]
Variance Intercept	NA	0.15 [0.04, 0.31]	0.16 [0.03, 0.33]	0.15 [0.04, 0.31]
Variance Change	NA	0.13 [0.06, 0.23]	0.20 [0.10, 0.33]	0.13 [0.06, 0.22]
PPp (95% CI)		0.46 [-11.75, 14.72]	0.00	0.60 [-13.43, 12.53]
DIC	NA	536	563	534
Relatedness Support				
Intercept	NA	6.29 [6.15, 6.43]	6.19 [6.05, 6.32]	6.33 [6.18, 6.47]
Change	0.16	-0.04 [-0.12, 0.05]	0.09 [0.04, 0.15]	-0.07 [-0.17, 0.02]
Variance Intercept	NA	0.32 [0.16, 0.53]	0.35 [0.18, 0.57]	0.31 [0.16, 0.52]
Variance Change	NA	0.14 [0.05, 0.23]	0.17 [0.08, 0.27]	0.13 [0.05, 0.23]
PPp (95% CI)	NA	0.42 [-9.75, 14.14]	0.05 [-1.40, 27.18]	0.44 [-10.44, 12.52]
DIC	NA	524	536	524

Note: Model A = Moderate precise priors were set for the expected change estimates variances (i.e., .01); Model B = Highly precise priors were set for the expected change estimates variances (i.e., .01); Model C = Low precise priors were set for the expected parameter estimates variances (i.e., .10); NA = Not available.

3.3. Conditional latent growth curve models

In the second step of the three separate models, each of the basic need support subscales were estimated to investigate the relationship between change in basic need support and subjective vitality measured in the end of the season (T3). The sensitivity analyses showed that all three models, for all the three basic need support variables, indicated good model fit. All models for each of the basic need support variables also showed similar DIC values for the three models. In addition, the parameter estimates for the intercept and change parameters as well as the regression paths were in the same direction. Because the models with the high informative prior for the variance on the change parameter (i.e., 0.001) had the lowest uncertainty, showed by the narrow CI) we chose to focus on these models, for all the three basic need support variables, in the discussion of the results (for all model fit indices see Table 3).

Table 3

Comparison of parameter estimates of using different priors in the conditional models.

	Prior Mean	Model A	Model B	Model C
Autonomy Support				
Intercept	NA	5.47 [5.32, 5.62]	5.47 [5.32, 5.62]	5.47 [5.32, 5.61]
Change	.16	-0.05 [-0.19, 0.09]	-0.05 [-0.19, 0.09]	-0.05 [-0.19, 0.09]
Variance Intercept	NA	0.09 [0.02, 0.28]	0.10 [0.02, 0.28]	0.09 [0.02, 0.27]
Variance Change	NA	0.31 [0.19, 0.49]	0.31 [0.19, 0.49]	0.31 [0.18, 0.49]
T3 Vit ON Change	0.39	0.19 [.10, .29]	0.19 [0.13, 0.25]	0.19 [-0.05, 0.42]
T3 Vit ON Intercept	NA	-0.34 [-1.36, 0.52]	-0.33 [-1.37, 0.53]	-0.38 [-1.43, 0.63]
T3 Vit ON T1 Vit	NA	0.53 [-0.05, 1.53]	0.52 [-0.07, 1.52]	0.55 [-0.13, 1.60]
T1 Vit WITH Intercept	NA	0.58 [0.03, 0.96]	0.57 [0.03, 0.96]	0.58 [0.04, 0.96]
PPp (95% CI)		0.41 [-.16.79, 20.44]	0.40 [-17.24, 20.38]	0.46 [-16.84, 20.68]
DIC		1103	1103	1104
Competence Support				
Intercept	NA	6.40 [6.28, 6.52]	6.40 [6.28, 6.52]	6.40 [6.28, 6.52]
Change	0.16	-0.20 [-0.30, -0.10]	-0.20 [-0.30, -0.10]	-0.20 [-0.30, -0.10]
Variance Intercept	NA	0.12 [0.04, 0.27]	0.12 [0.04, 0.27]	0.12 [0.04, 0.27]
Variance Change	NA	0.13 [0.06, 0.23]	0.13 [0.06, 0.23]	0.13 [0.06, 0.22]
T3 Vit ON Change	0.39	0.13 [0.06, 0.21]	0.12 [0.08, 0.17]	0.17 [0.01, 0.35]
T3 Vit ON Intercept	NA	0.02 [-0.04, 0.76]	0.02 [-0.93, 0.77[	0.00 [-0.99, 0.75]
T3 Vit ON T1 Vit	NA	0.39 [-0.28, 1.22]	0.39 [-0.29, 1.19]	0.40 [-0.25, 1.24]
T1 Vit WITH Intercept	NA	0.66 [0.31, 0.96]	0.66 [0.31, 0.96]	0.66 [0.30, 0.96]
PPp (95% CI)		0.42 [-15.62, 19.47]	0.43 [-15.87, 19.60]	0.44 [-16.75, 19.39]
DIC		955	955	955
Relatedness Support				
Intercept	NA	6.33 [6.19, 6.47]	6.33 [6.19, 6.47]	6.33 [6.19, 6.47]
Change	0.16	-0.08 [-0.18, 0.02]	-0.08 [-0.18, 0.02]	-0.08 [-0.18, 0.02]
Variance Intercept	NA	0.30 [0.13, 0.50]	0.30 [0.13, 0.51]	0.29 [0.13, 0.50]
Variance Change	NA	0.14 [0.05, 0.23]	0.14 [0.05, 0.23]	0.13 [0.05, 0.23]
T3 Vit ON Change	0.39	0.13 [.06, .22]	0.13 [.08, .18]	.16 [.00, .33]
T3 Vit ON Intercept	NA	0.04 [-.28, .35]	0.04 [-.28, .34]	.04 [-.28, .35]
T3 Vit ON T1 Vit	NA	.40 [.12, .63]	.40 [.12, .63]	.39 [.12, 63]
T1 Vit WITH Intercept	NA	.44 [.17, .72]	.44 [.17, .72]	.44 [.17, .72]
PPp (95% CI)		0.44 [-17.91, 21.67]	0.45 [-.17,89, 21.68]	0.45 [-17.94, 21.48]
DIC	NA	954	954	954

Note: Model A = Moderate precise priors were set for the variance related to the path between change in basic psychological need support and vitality measured at T3 (i.e., .01); Model B = Highly precise priors set for the variance related to the path between change in basic psychological need support and vitality measured at T3 (i.e., .001); Model C = Low precise priors set for the variance related to the path between change in basic psychological need support and vitality measured at T3 (i.e., .10); NA = Not available.

As shown in the unconditional latent growth models, only competence support had, in the conditional models, a credible, negative change during the season. For autonomy support and relatedness support no credible change was found. For the three basic psychological needs support variables there were credible positive relationships between change and vitality measured at T3 (for specific parameter estimates see Table 3). More specifically, increases in all basic psychological needs support were related to higher levels of vitality measured in the end of the season. For all parameter estimates specified in the model see Table 3.

4. Discussion

The purpose of this study was to investigate change in young elite athletes' perceptions of the three aspects of need-supportiveness, and the within-person relationship between change in perceived need-supportiveness and subjective vitality at the end of the year academic year. In general, the athletes reported a high and stabile level of autonomy-support and relatedness-support. However, they also reported small decreases in competence support.

4.1. Coaches became less competence-supportive throughout the year

The first objective of the current study was to examine athletes' perceived change in need-supportiveness throughout an academic year. Unique for this study was that the need-supportive constructs of autonomy-support, competence-support, and relatedness-support were analysed separately. The athletes reported to perceive the same level of autonomy-support and relatedness-support from their coach throughout the three measurement points. This was unexpected considering previous research and SDT theory indicating that competitive contexts typically pressure coaches to act less supportive (Cheon et al., 2015; Ryan & Deci, 2017). However, results revealed that *competence-support* from the coaches decreased throughout the season. Worded differently, as the research of Cheon and colleagues (2015) suggest, it may be argued that the coaches were unable to provide sufficient positive competence feedback to ameliorate the negative effect pressure to win (Cheon et al., 2015; Fortier et al., 1995; Reeve & Deci, 1996), and thus athletes perceived the coaches as less competence supportive. Imagine an alpine racer, skiing out of the course in the third gate. Having the coach to help her or him feel competent in this moment is hard. Yet, it is critical that coaches focus on, and practice competence supportive skills and emphasize how to learn from mistakes.

So why competence support? One may argue that over a season multiple competitions and catching up with school post-season increases the athletes' need for competence support.

To continue to develop and challenge one's self might be obstructed by obligations and comparing one's self with others, against school requirements, or by evaluations in the sport context. The elite school context and the stressors from dual careers are hard on young athletes (Kristiansen, 2017), which might easily have influenced the third wave assessed in at the end of the season (May). This was in the middle of final exams, when there is less training and more pressure for academic success. Another factor that might have influenced the results is that it is typical for athletes to feel inadequate when faced with the harsh reality of school (i.e., hard work but sometimes bad grades). However, it should be mentioned that the coaches were still perceived as competence supportive at the end of the season (see Table 1).

One major inference from the present study is the critical role of competence-support in the elite sport context. The competence need is salient in the elite sport school context with its direct competition, tangible feedback, non-controlling competence feedback, experiences of mastering drills and exercises at practice, and obligations and grading from the school as part of the elite sport context. Obviously, rivalry and competition (important characteristics of elite sport contexts) and the context's excessive pressure to perform has the power to influence the competence need through its informative and controlling aspects. When rivalry succeeds in helping athletes learn about their own skill level, it can inspire great feelings of competence (Ryan & Deci, 2017). To the contrary, the controlling aspects (e.g., pressures, demands, and performance contingent rewards and tangible reward) of the elite sport school context can have detrimental effects on athletes' competence need. Thus, competence support seems to require more attention than other need-supportive strategies. Although all three needs are an integral part of the need-supportive interpersonal style, we argue the importance of an extended focus on competence support in an elite context to ameliorated the negative effects of pressure to perform and win that is prevalent in the elite sport context.

4.2. Need support and subjective vitality

The second aim of the current study was to examine the relationship between changes in the three need-supportiveness constructs and vitality at the end of the academic year among young elite sport school students. We aimed to identify which of the three dimensions of perceived need-support has important implications for athletes' well-being. Results showed a credible positive within-person relationship between changes in all three need-supportiveness constructs from the coach and vitality measured at the end of the season. These observations support the SDT-sequence. Need-support consists of three different facets that require all three perceptions of psychological need-supportive behaviours to be salient predictors of well-being (Balaguer et al., 2012; Ryan & Deci, 2017).

4.3. Strengths and limitations

This study explicitly contributes to tree unique areas of research. First, the sample used is unique. Norway's most successful elite sport school for winter sports. Second, we assessed perceptions of all three basic psychological needs longitudinally. We followed the population over a year and had three waves of data. Including well-being in the analysis is unique.

The small sample size (a result of this school's population being small) and the use of self-reported measures are limitations. Finally, when only investigating athletes' perceptions of coaches' need-supportive behaviours, we cannot be sure if coaches stayed fairly stable or if this was simply due to athletes' perceptions.

5. Conclusion

This longitudinal study is the first to examine change in all three constructs of a need-supportive interpersonal style (e.g., autonomy-support, competence-support, and relatedness-support) in an elite sport school context. Competence support was the one need-supportive aspect that athletes perceived to be decreasing throughout the season. This is important information when designing coach training programs. We suggest an extra focus on the competence supportive strategies in elite contexts to counteract negative effects of losing, failing or being under pressure (Ryan & Deci, 2008). Further, the investigation revealed the importance of all three facets of the need-supportive interpersonal style for athletes' well-being. How to optimize the athletes' social environments is vital not only for coaches and other professionals dealing with young elite athletes, but also for sport schools and national sporting organizations.

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Declaration of Interest Statement

The co-authors and I have no interests that might be interpreted as influencing the research process or results, and APA ethical standards were followed in the conduct of the study. We have no conflicts of interest to disclose.

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Perceptions of need-support when "having fun" meets "working hard" mentalities in the elite sport school context

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ABSTRACT

The aim of this study was to investigate athletes and coaches' perceptions of coach need-supportive behaviour and to increase our understanding of the athlete-coach dynamic in the endorsement process. Video-based interviews were conducted with 11 athletes and 10 coaches at an elite sport school in Norway. Narratives were used to tell the story of the predominantly *hedonic athlete* (the aim of sport participation is having fun) and the predominantly *eudaimonic athlete* (the aim of sport participation is development). There was an obvious endorsement misfit between the group of athletes labelled hedonic and their coaches. The paradox of the endorsement process intensifies when the "have fun" mentality of the athlete meets the "work hard" mentality of the coach, which, for some athletes, undermines their need-satisfaction, commitment, performance, and well-being. The findings suggest a strong need for a fit between coach and athlete aims for successful coaching in the elite sport school context.

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Introduction

Coaches' interpersonal style plays an important role in creating a social context that fosters autonomous motivation and adaptive athlete outcomes (Fenton, Duda, Quested, & Barrett, 2014; Langan, Blake, & Lonsdale, 2013; Smith, Ntoumanis, & Duda, 2010). A need-supportive coaching style can support athletes' basic psychological *needs a*nd facilitate optimal motivation and positive persistence in sport (Ntoumanis, 2012). Paradoxically, however, need-support is only as supportive as the athlete perceives it to be. The athletes' perception of having choices and their willingness to endorse the training context and their coaches' suggestions – despite intense demands, structure, rules, and expectations – is fundamental for their autonomous sports motivation and adaptive outcomes. Nevertheless, there is a paucity of

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research examining and comparing athletes' and coaches' perceptions of coach *need-supportive* behaviours at the elite level. The aim of this study is to increase our understanding of the athlete-coach dynamic in the endorsement process.

Two central concepts in theorizing young elite athletes' sport motivation are *eudaimonia* and *hedonia* (Huta & Waterman, 2014). Eudaimonia is defined as striving to use and develop the best in one's self in ways that are congruent with one's values, and hedonia is defined as striving to experience pleasure, enjoyment, and comfort (Huta & Ryan, 2010). When these concepts are defined as aims, they are both orientations (Huta & Waterman, 2014), which allows us to discuss the concepts in parallel terms (Huta & Ryan, 2010; Huta & Waterman, 2014; Ryan, Curren, & Deci, 2013). Hedonia and eudaimonia are further defined as orthogonal concepts (Huta & Ryan, 2010). Thus, athletes can have a range of combinations of hedonic and eudaimonic aims simultaneously. Youth with a hedonic approach to sport participation predominantly seeks pleasure and fun, whereas youth with a eudaimonic approach to their sport participation predominantly aims for development of their potential. Athletes who are high in both hedonic and eudaimonic aims respectively seek pleasure and fun and development though their sport participation. Hence, in this study we identified and analysed the hedonic and eudaimonic athlete profiles.

Both approaches to sport are culturally embedded and stereotyped in the media. Snowboarding tends to be portrayed and seen as the hedonic "prototype" due to the historical resistance of the structures and disciplines of other sports. For instance, Terje Håkonsen, one of the best snowboarders of all times, was an important voice against snowboarding becoming an Olympic sport (Heino, 2000). This is further supported by the Norwegian Snowboard Federation's vision, which emphasizes the *fun* aspects of snowboarding (Snowboardforbundet, 2018). This is also true for freeski. To the contrary, the cross-country skiing, biathlon and alpine skiing in the Norwegian context may be a predominantly eudaimonic "prototype." For example, most winning winter Olympian of all times, cross-country skier Marit Bjørgen, is portrayed as a very hard-working athlete by the media in Norway. The Norwegian Ski Federation's developmental plan for cross-country skiing is an "appropriate long-term developmental guide from early childhood to elite skiers" (Skiforbundet, 2018, para. 1). This represents a typical eudaimonic approach to sport, and this approach is dominant in the increasing number of sport schools.

The elite sport context and elite sport schools

Sports schools are vital in the talent development process in many countries such as Germany, China, Canada, England, Sweden, Singapore, Italy, and the Netherlands (De Knop, Wylleman, Van Houcke, & Bollaert, 1999;

Radtke & Coalter, 2007; Way, Repp, & Brennan, 2010). The transition into the upper secondary school (ages 16–19) is an important period for athletes as they are introduced to a more intense and structured period both in sports and academics (Bloom, 1985; Wylleman & Lavallee, 2004). Sport schools in Norway are acknowledged as talent development pathways (Kristiansen & Houlihan, 2017), and in 2016 a total of 3131 athletes and 461 coaches attended and worked at 12 private and 22 public Norwegian sports schools (Å. Fiskestrand, personal communication, August 8, 2017).

The non-profit private foundation *The Norwegian College of Elite Sport* (hereafter NTG) is a network of elite sport schools in Norway. NTG currently runs six schools with 990 students participating in 27 different sports (Norges Toppidrettsgymnas, 2018). Out of the approximately 34 elite sport schools in Norway, NTG is the most successful (Berntsen, Lemyre, & Røe, 2014). Current and former NTG athletes have achieved considerable success, accumulating 175 world championship medals, and 26 gold, 17 silver, and 21 bronze medals in the Olympics (Norges Toppidrettsgymnas, 2018). For the 2014 winter Olympics 30% of the Norwegian team members were current or former NTG students and for the 2018 Olympics 25% were (Norges Toppidrettsgymnas, 2018). Arguably, NTG is a stepping-stone for national teams and professional sports.

Theoretical framework

Self-determination theory (SDT), first formulated by Deci (1975) and extended by Deci and Ryan (1985, 2000, 2017)), is an organismic theory of human behaviour that is focused on the ways in which social contextual factors influence peoples' thriving and growth. SDT differentiates types of motivation along a continuum from controlled to autonomous and is based on the assumption that higher relative autonomy is associated with greater quality behaviour and persistence (Ryan & Deci, 2017).

The theory distinguishes between three types of motivation. *Amotivation* can be described as athletes going through the motions with no intention to act and thus have non-regulation. *Extrinsic* motivation leads to people engaging in behaviours because of the instrumental value of the behaviour. This form of motivation has four major types of motivational regulations: external, introjected, identified, and integrated. Through the process of internalization athletes can take in values, beliefs, or behavioural regulations from the sport context and transform them into their own. Successful internalization leads to athletes practicing their sports, also when the coach is not there to monitor them. The "cornerstone" of SDT's theoretical foundation is the concept of *intrinsic* motivation (Ryan & Deci, 2017). Intrinsically motivated athletes act because the activity is inherently

satisfying to them (Deci & Ryan, 2002). According to the theory, intrinsic motivation is both a basic and a lifelong psychological growth function within humans.

Central to SDT is the distinction between controlled and autonomous motivation. Autonomous motivation has an internal perceived locus of causality whereas controlled motivation has an external perceived locus of causality. The implication of autonomous motivation is athletes engaging in an activity with a full sense of willingness and volition, and according to the theory, intrinsic motivation is the only true form of autonomous motivation. In contrast, controlled motivated athletes feel coerced to practice (or do other sports specific activities) in specific ways. Extrinsic motivational regulations are not inherently satisfying, and extrinsic incentives are needed to act. Extrinsic regulations vary in their degree of autonomy along the relative autonomy continuum, spanning from relatively controlled (external and introjected regulations) to relatively autonomous (identified regulation and integrated regulation) (Deci & Ryan, 2002, 2000). The different regulations can coexist within the sports domain and several of them can be operative within the same practice session (Ryan & Deci, 2017).

To sum up, autonomous motivation, when athletes whole-heartedly engage in the activity and practice to become more skilled players because it is enjoyable or important to them is associated with athletic development, sustained sports participation, enjoyment, and well-being and tapping into this motivation is preferable when working with young athletes (Balaguer et al., 2012; Carpentier & Mageau, 2013; Felton & Jowett, 2015). This is because acting for controlled reasons is associated with ill-being (Healy, Ntoumanis, van Zanten, & Paine, 2014), burnout (Jõesaar, Hein, & Hagger, 2012), and lack of persistence (Quested et al., 2013). The process of eudaimonia is central when considering optimal functioning and wellness for athletes. This is also present in the recent SDT writings, in which the notion of *flourishing*, a concept closely related to eudaimonia or living well, is given more focus (Ryan & Deci, 2017).

The need-supportive coaching style

Another important aspect of SDT is the assumption that all humans have three basic psychological needs – *autonomy, competence*, and *relatedness* (Ryan & Deci, 2017). Autonomy concerns the extent to which people experience their behaviour to be volitional or self-endorsed (Ryan & Deci, 2017). As Soenens, Vansteenkiste, and Sierens (2009) work has shown, being autonomous is not equated to making choices (being independent). An athlete can feel autonomous in the absence of choice when he or she endorses his or her coaches' mandated activity because he or she agrees

with it. When feeling ownership of one's own actions the need for autonomy is satisfied and the athletes' resources, interest, and capacities are invested in the action. The opposite of self-endorsement is feeling coerced, compelled, or seduced to act by forces external to self (Ryan & Deci, 2017).

To feel competent, the athletes' actions must be perceived as self-organized or initiated, in other words, they feel a sense of ownership of the activities that they succeed in (Deci & Ryan, 1985). When feeling that one masters the drills and exercises in practices, and the goals are self-set, the competence need is satisfied.

The need for relatedness is the need to perceive that others care for us unconditionally (Ryan & Deci, 2017). To belong, be significant, and matter in the eyes of others is a primary goal of human behaviour. When athletes feel part of their sport's social group and have a sense of belonging with their peers or coaches, the need for relatedness is satisfied and the athlete experiences need satisfaction.

According to basic psychological needs theory (BPNT), coaches can foster athletes' autonomous motivation through their *interpersonal style* when athletes perceive their needs to be satisfied (Mageau & Vallerand, 2003). The coach's interpersonal style reflects the strategies he or she usually adopts when interacting with his/her athletes.

As need support is defined as autonomy support accompanied by structure and interpersonal involvement (Mageau & Vallerand, 2003; Matosic, Ntoumanis, & Quested, 2016; Taylor & Ntoumanis, 2007), the coach, as an important authority figure, should combine all three aspects of need-support. Autonomy support (requires this person to take others' perspective in consideration, acknowledge others' feelings, promote choice and decision-making, and offer a meaningful rational whilst minimizing external demands) accompanied by structure (there are rules) and involvement ("I care about my athlete") makes up the need-supportive style (Mageau & Vallerand, 2003). Then need-support can be conceptualized as the interpersonal behaviours that encourage the satisfaction of the three basic psychological needs through support of athletes' autonomy, competence, and relatedness (García-Calvo, Sánchez-Oliva, Leo, Amado, & Pulido, 2016; Rocchi, Pelletier, & Desmarais, 2017).

Coaches who provide need-support can help athletes internalize extrinsic motivation and develop the psycho-social maturity of *identified motivation* (Deci & Ryan, 2000). Identified motivation is needed to develop one's potential and willingness to take on tasks that may not be enjoyable, such as repetitive and demanding drills. In contrast, controlling behaviours are need undermining and include chaos (vs structure), hostility (vs warmth), and coercion (vs autonomy-supportive) (Skinner & Edge, 2002). The absence of need-supportive behaviours does not automatically imply the presence of thwarting behaviours (Sheldon, 2011). An interpersonal style

that actively thwarts athletes' needs can be considered controlling (Bartholomew, Ntoumanis, Ryan, Bosch, & Thogersen-Ntoumani, 2011). A need supportive style is preferable over a controlling interpersonal style, which may actively thwart athletes' needs (Bartholomew et al., 2011). The concepts of controlling style and need-supportive style are orthogonal (Matosic & Cox, 2014; Soenens et al., 2009). Initial empirical evidence indicates that coaches often use a combination of the behaviours from these two interpersonal styles (Matosic et al., 2016).

Despite knowledge about and attempts to foster need-supportive coaching, there are determinants that influence coaches' interpersonal style: the coaching context, perception of athletes' behaviour and motivation, and coaches' personal orientation (Mageau & Vallerand, 2003). First, pressure from above is the pressure coaches feel to perform – this can determine how they act (Mageau & Vallerand, 2003; Pelletier, Séguin-Lévesque, & Legault, 2002). Secondly, if coaches perceive their athletes to be lazy and lacking incentives and engagement, they tend to pressure these athletes and downplay the motivation they wish to see (Rocchi, Pelletier, & Couture, 2013). Thirdly, coaches' beliefs about what good coaching is influences how they behave toward their athletes.

Perceptions of need-supportive behaviours

The competitive context typically involves extrinsic incentives and contingencies of approval that constantly challenge autonomous motivation (Cheon, Reeve, Lee, & Lee, 2015; Ryan & Deci, 2017; Standage & Ryan, 2012). For instance, if an athlete perceived pressure to win (such as prize money), then this impacts intrinsic motivation negatively. However, winning can also have an informational functional significance and enhance intrinsic motivation if competence feedback is offered in a need-supportive way (Ryan & Deci, 2017).

Despite the importance of fostering or designing need-supportive environments, few studies have investigated multiple perspectives (i.e. athletes' perceptions, coach perceptions, observer's perceptions) of coach interpersonal behaviour. In one of the few studies on multiple perspectives, Smith and Smoll (1996) found low or no correlation between coaches' self-reports and observers' ratings of coaches' interpersonal behaviour. Athletes' (young team players') ratings correlated more with the observers' ratings than that of the coaches. In a more recent study, Lyons and his colleagues examined coach and athlete perceptions of autonomy-supportive coaching in a group of Olympic ski cross athletes and found that there were consensus between coaches providing and athletes perceptions of autonomy-supportive behaviours (Lyons, Rynne, & Mallett, 2012).

In this study, we use the term need-supportive strategies rather than separate them into autonomy-supportive strategies, relatedness-supportive strategies and competence-supportive strategies because the needs are interlinked, and the different strategies support more than one need (Aelterman et al., 2013). The multiple needs-effect has been observed both in intervention-based studies (Cheon et al., 2015) and correlational studies (Amorose & Anderson-Butcher, 2007; Adie, Duda, & Ntoumanis, 2008; Gagné, Ryan, & Bargmann, 2003; Hodge & Lonsdale, 2011) and longitudinal correlational studies (Adie, Duda, & Ntoumanis, 2012; Pelletier, Fortier, Vallerand, & Briere, 2001). For instance, when coaches *inquire about and acknowledge athletes' feelings*, they communicate their involvement as well as their respect for the athletes, thus influencing the athletes' perceptions of relatedness in addition to autonomy. Perceptions of competence is influenced directly by coaches' *non-controlling competence feedback*, which also supports autonomy (Mageau & Vallerand, 2003).

SDT suggests that coaches who support need-satisfaction facilitate intrinsic motivation, internalization and integration of extrinsic motivation, and an autonomous causality orientation (Ryan & Deci, 2017). The facilitation of intrinsic motivation is hedonic in nature as it aims to foster athlete enjoyment in sports, but what happens with predominantly hedonic athletes who work with coaches who aim for their athletic development? From the above it is apparent that elite sport contexts are predominantly eudaimonic in nature (Huta & Waterman, 2014) due to the focus on winning. As a result, coaches often seek to develop athletes' potential through internalization of extrinsic motivations such as the knowledge and values for optimal development of athletic skills through instilled structure, rules, and demands. Athletes with a predominately eudaimonic approach to sport share this aim with the elite context, while hedonic athletes will struggle more to see the benefit of being part of such a program. We know little about how need-support is perceived by athletes with predominantly hedonic aims – which would be misaligned with their context–and we also know little about athletes who resist the internalization and integration of the values and goals of their context. Based on this reasoning, the purpose of this investigation was to gain insight into the extent to which athlete and coach perceptions of coach need supportive behaviours match. Second, we wondered, how does the fit between coach and athlete aims (hedonic and eudaimonic) for their sports participation influence the athletes' endorsement of coaches' behaviours, structure, and rules?

Method

After obtaining approval from the Norwegian Social Science Data Services, informed consent was obtained from athletes and coaches before conducting the interviews (May 8th-10th, 2017).

Context and participants

The athletes and coaches at NTG face a myriad of challenges on a regular basis. During the off-season, the young winter sport athletes have two training sessions a day to prepare for high performance through physical, tactical, technical, and mental skill building. This is hard work, can be repetitive, and intrinsic motivational engagement is not enough to develop these skills. In the spring and fall, they travel and have on-snow camps on glaciers in Norway and the Alps (Central Europe). This typically involves on-snow training for the first half of the day, followed by a dry-land training session. In addition, the athletes do school work for a few hours in the evening. The athletes are responsible for packing their lunches, their recovery time, their equipment, being prepared for and focus during on-snow training, and for keeping up their schoolwork. The competitive season typically involves more pressure to perform or win. The young elite athletes (often the best in their sport in Norway and future Olympians) constantly face direct feedback from competition or reward and control from peers, parents, and coaches.

Eleven junior elite winter sport athletes aged 16–18 years (M = 17, 1, alpine skiing n = 2, freeski and snowboard n = 4, biathlon n = 3, cross-country skiing n = 2), and 10 winter sport coaches aged 25–54 years (M = 36,4, alpine skiing n = 2, cross country skiing n = 3, biathlon n = 3, snowboard and freeski n = 2) were interviewed for this study.

Materials

A manuscript was written based on knowledge about the coaching context and sport and informed by Mageau and Vallerand (2003) autonomy supportive strategies (see Table 2), accompanied by structure and interpersonal involvement. Based on this manuscript, video fragments were produced to reveal seven need-supportive strategies (1.37 – 3.18 minutes). To make the video fragment realistic, athletes and coaches from one of the other NTG schools served as actors. A professional freelance video editor was responsible for the production of the seven videos (filming, editing). The first author supervised the editing and provided context for the need-supportive strategies and the voice-overs. Each video started with a written description of one of the seven need-supportive coaching strategies, and a sport specific scenario was next described by a voice-over while following an introduction-section of freeskiers practicing on-snow, doing flips and tricks on jumps and rail, while music is playing in the background. Next, the videos showed a dialogue between a coach and an athlete or a monologue by the coach. Each scenario was shown in a need-supportive way ("good coach") and a controlling way ("bad coach"). The videos ended

with a reflection by one of the athletes on how it felt to be coached in a typical need-supportive style versus a controlling style, which was the main goal of the videos. Next, these video fragments were used as stimulus for questioning because video can help create a meaningful common ground for discussion (Bryman, 2015; Harper, 2002; Pink, 2013).

Interviews

We chose different approaches to the athlete and coach interviews.

Video based focus group interviews with athletes

The focus group method was chosen to provide in depth information about the members' experiences with their coaches' interpersonal behaviours, and to explore how they discussed this issue (Bryman, 2015). In addition, focus groups allow for a natural conversation pattern. Athletes were appointed into groups based on their sports: Focus group 1: alpine skiing (n = 2); Focus group 2: freeski and snowboard (n = 4); and Focus group 3: biathlon and cross-country skiing (n = 5). The focus group interviews were scheduled and conducted at their school. The seven video fragments served the purpose of line of questioning; they were discussed one by one ("how do you perceive your coach to act out that strategy?").

All the interviews started with an informal chat about the athletes' everyday life at ski camp to break the ice. Next, the interviewer played one video at the time, asking the athletes to give examples of how or to what extent their coaches use that need-supportive strategy. A discussion of the athletes' perceptions of their coach ability to use the need-supportive strategies followed. Aiming to be guiding but not intrusive, the interviewer avoided interrupting the naturally occurring discussions between group members. Before moving on to the next video, the interviewer asked if the athletes had any other comments or examples they wanted to share. It was interesting to notice that some of the athletes elaborated on their examples after listening to their fellow athletes. This, we believe, helped to create a more in-depth account of what they think than had we chosen one-on-one interviews (Bryman, 2015). The interviews were audio recorded and lasted from 55 minutes to 75 minutes.

Video based interviews with coaches

We chose to interview the coaches individually to grasp every coach perception of their use of need-supportive strategies after viewing the seven need-supportive video fragments. Coaches were asked to what extent and how they used the seven need-supportive strategies (one at a time) in their interactions with the athletes. Before watching each video fragment, the interviewer asked the coaches to think about examples of them using or not using these strategies. Each video was on average two minutes long.

The interviews took place at the coaches' workplace. The two-way interaction process in the interview setting is the product of the researcher, the participant, and the relationship between them (Finlay, 2002). To create a safe setting and empower the other, communication strategies such as not interfering or expressing our own opinions and paraphrasing as part of the role as an active listener were employed (Sparkes & Smith, 2013). The interviews were audio recorded and lasted about 45 minutes.

Both coaches and athletes were informed that their anonymity would be protected, the confidentiality of the study upheld and their freedom to withdraw from the study at any point in time. No consent was withdrawn.

Data analysis and interpretation

The interviews were transcribed verbatim, which resulted in 52 pages of raw text from the coaches' interviews and 40 pages from the focus group interviews with the athletes. To maximize trustworthiness of this analysis, the six step guidelines for thematic analysis was followed (Braun & Clarke, 2006). The first phase was to familiarize ourselves with the data through the interviews and transcription. Then, the text was read and re-read and meaning started to form through generating initial codes (phase two) relevant for illustrating perceptions of the seven need supportive strategies. The text was highlighted with different colours. The different features of the data were systematically organized into a table to help us search for themes (phase three) in the answers of how athletes vs coaches express using or perceiving the need-supportive strategies (Mageau & Vallerand, 2003). Emerging findings were compared with the data to verify understanding of the perceptions of need support through vivid examples, and this was discussed with colleagues (phase four: reviewing themes). Reading, coding, and organizing the full text resulted in thematic maps and tables. Then, a refining of the specifics of each theme led us to define and name themes (phase five). Using these maps and tables, representing coaches' and athletes' perceptions of need-supportive coach behaviours, the process of evaluating codes and clustering took several rounds of reviewing and developing themes to the coded data "quotes" and the dataset as a whole.

In this process, another interesting finding was constructed, that of two distinct narratives that are related to the athletes' aims with sports participation (see Table 1). It became clear that there were two different ways to talk about aims of sport participation, and these were related to the athletes' sport and the sport context. The 11 athlete stories have been narrowed into two stories, based on similarities and differences in the narratives. Elliott (2005) defines *narrative* as a way of organizing a sequence of events into a whole, in addition to distinguishing between *first-order* narratives, defined as the stories individuals tell about themselves and their own experiences, and *second-order*

Table 1. Examples of quotes from the 11 athletes, which resulted in the creation of the hedonic and the eudaimonic athlete narratives.

The predominantly hedonic athlete – aiming to have fun and to be stoked as a result of sports participation	The predominantly eudaimonic athlete – aiming to develop and reach their goals as a result of sports participation
"I just want to snowboard and have fun. Because then I am stoked."	"of course we are practicing because we want to be good at it"
" it is not awesome to talk about goals"	"you do not practice just to practice, you practice for a reason"
"if you have to set a goal for a new trick, then I do not feel like doing the trick anymore"	".. we know a lot about what we need to practice to achieve what we aim for"
"it is when you are in the park that you see what you want to try. Suddenly you get stoked and want to try it"	"we know what we want to do, and what our goal is, and then the coaches try to help us reach that goal"
"If I am doing a trick, and I am stoked, then the coach wants me to switch to a different jump or a different trick, you feel the control." ". . .and then you are not stoked anymore"	"..it is all about how you can practice to reach your goals"
"we just want to have fun on the slopes together".	"the coaches support me so I can develop my skills in the sections that I struggle with, so I can focus on the things that makes me better"
". . .to just snowboard together and have fun, that is optimal"	"..if we are struggling, the coaches can film us, so that we can analyse it later, and then you see what you need to do to improve"

narratives defined as the accounts constructed by "researchers to make sense of the social world, and of other people's experiences" (Elliott, 2005, p. 13). The latter do not necessarily focus on individuals, and a particular type of second-order narrative is a *collective story* (Richardson, 1990), which "displays an individual's story by narrativizing the experiences of the social category to which the individual belongs" (p. 25). In the results section, the predominantly *hedonic* athlete is referred to as he (*he* participates in sports to have fun and be stoked) and that of the predominantly *eudaimonic athlete* is referred to as she (*she* participates in sport to develop). The coach of the hedonic athletes was named she and the coach of the eudaimonic athlete was named he to ensure gender equality. We identified four main discrepancy points between coach and the two athlete narratives of need-supportive behaviours (phase six, producing the report). Vivid and compelling quotes were selected, and these quotes relate back to the research question of the coherence between coach and athlete perceptions of need-supportive coach behaviour.

Results

Before elaborating on the experiences of the predominantly hedonic and predominately eudaimonic athlete, an overview of the fit between the two narratives and their coaches, with a focus on the discrepancies, is offered.

Coach-athlete discrepancies

When analysing the coach and athlete interviews, there was an obvious misfit between the group of athletes labelled the predominantly "hedonic"

athlete and his coach, while this discrepancy did not exist in the group of athletes we labelled the predominantly "eudaimonic" athlete and her coach. The discrepancy was related to coach and hedonic athlete perceptions of need-supportive coaching skills (see Table 2). The results revealed discrepancies in the hedonic athlete and his coach's perceptions in four of the seven need supportive strategies.

The four discrepancies (predominantly autonomous strategies) are related to trust, involvement, explanation, and encouragement of initiative. The first discrepancy was found in trust – developing this is a central skill for coaches in respect to avoiding guilt inducing criticism, which may result in controlling statements and tangible rewards. A common theme in the hedonic athlete's stories about training and competition is a lack of coach-trust (see Table 1). The coach on her side offered examples of trusting the athletes to be responsible for on-snow practice. The second discrepancy was related to athlete involvement. It might be that the coach perceived the school structure and the ski academy rules to restrain athlete involvement. Real choices and athlete involvement in decision and solution finding processes is critical to athlete autonomy. The hedonic athlete's coach gave examples of providing choices and how she involved the athlete. Separately, the hedonic athlete experienced a lack of space for being an active part in his own development. The third discrepancy originated in the lack of explanation from coach to athlete. The coach perceived herself to offer meaningful explanations for the chosen exercises and rules to the athlete. However, the hedonic athlete did not find these the

Table 2. Coach athlete narratives: perception of need-supportive behaviours.

Need-supportive strategies	Hedonic athlete and his coach	Eudaimonic athlete and her coach
Inquire about and acknowledge the athletes feeling: open questions – active listening, emotional response, act in a warm and **caring** way	Coherence in perception	Coherence in perception
Supportive behaviours: show the athlete that you **trust** him/her, avoid judgement and criticism, minimize overt control (should, have to).	Discrepancies	Coherence
Provide choice within specific rules and limits: clarification of the responsibilities, **involve** the athlete in decision and solution finding processes and give the athlete choices.	Discrepancies	Coherence
Provide a rational for task, limits and rules – structure: **explain** why you chose a specific exercise, tactic or rule and share knowledge about the sport.	Discrepancies	Coherence
Allow athletes opportunities for initiative taking and independent work: ask open questions and **encourage initiative** from the athletes.	Discrepancies	Coherence
Provide non-controlling **competence feedback**: factual non-judgmental feedback about problems, positive feedback that convey high but realistic expectations, and target behaviour that are under the athletes' control – optimal challenge.	Coherence	Coherence
Facilitate **self-improvement focus** (prevent ego-involvement): focus on self-improvement, focus on mastery and effort in the group, self-set goals, and give attention to all the athletes regardless of if they are doing well or struggle.	Coherence	Coherence

rationales meaningful. The final discrepancy was related to initiative and to what degree the athlete feels opportunities for initiative taking and independent work. The data revealed that the hedonic athlete felt hindered in his attempt for initiative. In contrast, the coach gave examples of encouragement of initiative given to the hedonic athlete.

In contrast, Table 2 revealed the fit between the eudaimonic athlete and her coach. As the eudaimonic athlete endorsed the structures, rules, training sessions, and other demands from her coach, she perceived the coach to be need-supportive and as helping her in her strive for development. In contrast to the hedonic athlete, she perceived the coach to trust her, involve her, and offer choices and meaningful rationales for the activities.

SDT postulates that a need-supportive interpersonal style contributes to greater need-satisfaction (Aelterman et al., 2013; Deci & Ryan, 2000). However, as seen from the results presented in Table 2, sometimes need-supportive acts are not perceived as need-supportive (by the hedonic athlete) or the coaching context creates a gap in the coach-athlete relationship. The coach is also expected to act in line with the values and expectations of her employer (NTG) and according to what she knows about talent development. The context represents a typical eudaimonic approach to sports participation. Consequently, there is a misfit between the aim of the hedonic athlete and the aim of his coach – and self-endorsement is not present. This will be elaborated upon below in the predominately hedonic athlete's story and the predominately eudaimonic athlete's story.

The hedonic athlete's elite development

"Playing" sport is a way of life for the hedonic athlete: "Snowboarding is freedom, it is not *elite* sport, it is life." For the hedonic athlete, the main goal of sports participation is not to become the best: "I am not here to win." The hedonic athlete attends sport school to have more time to "simply snowboard." The schools' focus on training is neither understood nor internalized: "If it was up to me, I wouldn't train at all… I can snowboard all day without becoming tired." Tests and doing drills that are not snowboard or freeski related seem unnecessary: "it is really hard and completely unnecessary that we run 3,000 meters with the other athletes from the other sports." Development principles such as goal-setting are not understood or accepted either – it is simply seen as a waste of time.

When the coaches interfere with how the hedonic athlete plays sport, it is perceived as meaningless: "They try to have us develop skills the same way other athletes do…it is a totally different strategy to become a *great* snowboarder." If the coach tells him what to do without discussing it or listening

to him, you can be certain he won't listen: "if they just decide to do a thing, and we have to do it, we will not listen to that." The hedonic athlete easily feels pressured and controlled by his coach to act in a specific way: "I feel that they once in a while try to listen, but they still pressure you to do what they want you to do…they still believe *their way* is the right way."

In short, the worst thing a coach might try to do is to "pressure" the hedonic athlete to act as a eudaimonic athlete: "I feel that the snowboard and freeski program is about to collapse." The hedonic athlete wants his coach to take his initiatives seriously. "Every time I suggest something…it always end up with the coaches saying "yes, but *we know* what's best for you."" That is an unacceptable response in the hedonic athlete's eyes. He will for instance have a hard time doing a jump or not try out a hill if he does not see the reason behind the rules and demands from his coach. Learning new tricks and improving his skills must happen spontaneously and when having fun on the hill: "Suddenly you get *stoked* and want to try it". *Stoked* is a frequently used word by the hedonic athlete to express excitement. Any demand of structure is perceived as lack of trust and respect – it is boring and interferes with a "fun" lifestyle and is consequently questioned: "my coach told me I have to write a training log. I do not like writing in it, but we *have* to write in it. When I ask why, she says: "how else can I know that you have been practicing?" In short, a hedonic athlete does not accept coaching, as almost any attempt seems for him to reduce his control, and he feels that he practices because the coach demands it of him (external perceived locus of causality).

The eudaimonic athlete's elite development

It is "easier" to coach the eudaimonic athlete as she has a broader perspective on development – she accepts the duality that hard work can also be enjoyable: "obviously, we are practicing because we want to be good at it." For her, it is all about goal-setting and reaching goals: "I know what I want to do, and what my goal is, and the coaches help me to reach that goal." The coach is a *helper* in the development process, and the help is needed to excel: "The coaches support me so I can develop my skills… if we are struggling, the coaches can film us, so that we can analyse it later. In this way, she can constantly keep developing."

To be coached does not reduce her perception of independence: "… we know a lot about what we need to practice to achieve what we aim for." Trust is also important for the eudaimonic athlete, and she feels trusted by her coach: "they support my choices in the planning process." Furthermore, "you do not practice just to practice, you practice for a reason." In this context, planning is seen as an important tool for success, hence, planning and goalsetting become meaningful. The eudaimonic athlete expects responsibilities and demonstrates awareness of her

responsibilities within the structure: "you have to be serious and show up to practice with the right equipment, you have to get up early enough to be there on time and so on. You have to give a little to get a little."

Discussion: when "work hard" meets "have fun" mentalities

We identified two main challenges (and paradoxes) associated with the misfit between the hedonic athlete and elite sport expectations and coaching.

The coach challenge: the elite sport school context

Young elite athletes can benefit from instructions and structure provided by experienced coaches (Mageau & Vallerand, 2003). The potential for enhanced motivation and improved performance is present if coaches would instead of using controlling strategies (coach centred), adapt their own behaviours to fulfil their athletes' needs of autonomy, competence, and relatedness (athlete centred). NTG's structure is eudaimonic in nature, and the coach must operate within an elite sport school context and its values, goals, aims, and curriculum. The coaches followed the recommendations of providing rationales and give choices etc., but the hedonic athletes still felt controlled. The discrepancies in our data is a clear sign of how the hedonic athlete perceives the mandated activity and rules in the sports context as negative and shows that he neither understands the importance of nor accepts the training activities and structure of the school and coaches' values.

The coaches are evaluated against the school's vision of developing athletes to the point of them being "capable of winning medals in international championships, qualifying for university and academic education and developing excellent ethical principles" (Norges Toppidrettsgymnas, 2018, para. 3). Hence, the coaching context influences coach behaviour (Mageau & Vallerand, 2003). It is challenging for coaches when athletes do not endorse coach behaviours due to the common "seeking fun and pleasure" theme in the snowboard subculture (Heino, 2000) and the same is true for freeski. Endorsement of coaches' actions will happen if coach and athlete values are in coherence, or when the athletes believe in and trust the importance of the structure provided by their coaches. Discrepancies between coach and athlete aims might be a misfit between the athlete and the sport school context. The school context may end up being a barrier in the athlete-coach relationship if not discussed or considered.

The athlete challenge: culture trumps structure

The data reveal that the hedonic athlete engaged in mandated activities such as on-snow practice in a specific snowboard park or keeping a training log because his coach *told* him to do so. This pressure on how

to think, feel or behave, termed controlled motivation (Reeve, Deci, & Ryan, 2004), clearly undermined the hedonic athletes' intrinsic motivation and impacted his well-being and sport participation (Mageau & Vallerand, 2003; Ryan & Deci, 2017). It also seems that he expected the sport culture at the sport school to be similar to the snowboarding and freeski sports culture. This culture has an emphasis on *fun* and non-organized training, and this is reflected in the stories they tell about their heroes. These findings are in consonant with Soenens et al.'s suggestion that personality, culture, and other variables can alter whether or not a person will perceive a behaviour as controlling (Soenens, Vansteenkiste, & Van Petegem, 2014). Soensens et al.'s model sheds important light on the implications of coach interpersonal behaviour because once people perceive the context as controlling, they experience negative outcomes. There is no fit between coach demands and the stories of his heroes, who have won the X-games, the "Legend Games" and who have "never been in the gym." Furthermore, these stories may lead to self-handicapping strategies and reduce the hedonic athlete's chances of developing his skills, as he neglects the extensive empirical evidence that practice is necessary for elite level performance in any domain (Ericsson, Charness, Feltovich, & Hoffman, 2006; Ericsson, Krampe, & Tesch-Römer, 1993; Starkes & Ericsson, 2003).

Finally, the hedonic athlete's beliefs about practice not being necessary, fun, or meaningful are at the core of the discrepancies between the hedonic and the eudaimonic narratives. Expectation clarification seems important for the endorsement process when the rationales given by the coach are not meaningful to the athlete and constant testing of rules and school structure may be the end result. The elite sport context is demanding, and the "we do not practice" mentality is not part of this. The challenge is that, as our findings show, even when coaches offer sound rationales, give explanations for demands and rules, the hedonic athlete does not perceive it as need-supportive. Instead, he sees it as controlling.

Understanding dilemmas: how to break the vicious circle?

Coaches perceive the hedonic athlete to have low autonomous motivation, and in response, they increase their use of controlling behaviours to get him to practice *enough* to develop elite athlete skills. Paradoxically, the coaches' reaction to what they see as a lack of initiative in athletes (e.g. reducing independent trainings) – more controlling behaviour – results in decrease in the very motivation they wish to increase in their athletes.

On the other hand, athletes emit behaviours that generate the very controlling strategies they do not wish in their sport lives. Instead, the hedonic athlete simply perceived a lack of respect. We would like to argue that this has become a *vicious circle* (Mageau & Vallerand, 2003). This is

problematic due to the importance of need-support for internalization of extrinsic motivation on the elite level (Ryan & Deci, 2017). To "have fun" mentality without the "working hard" mentality is a misfit with the NTG's aim to develop elite athletes, and thus challenges the internalization process. If no external reasons are meaningful to the athlete, internalization can become challenging, and these athletes will be challenging to coach. To explain how need-supportive coaching works in practice, three suggestions for how to facilitate internalization of the values in the elite sport context are provided below.

Implications for coaches

(1) Communicate the values and expectations of the sport context to athletes in the application process. This can be an important starting point to avoid a person-environment misfit. A key question in the recruitment process is: Is the athlete willing to accept those expectations?
(2) Internalization of extrinsic motivation takes time and is hard work. Coaches should challenge and involve the athletes' heroes to "tell the truth" both to the media and to the youth in the sport school setting.
(3) The Federations and other key stakeholders that represent the subculture are encouraged to communicate to young aspiring snowboarders and freeskiers that enjoying the process and having fun does not mean not working hard. By getting "heroes" to define what fun means for *them* and explain how it feels to learn and develop a new trick may give young athletes a different picture of how to become a great snowboarder or freeskier. The Snowboard Federation and the part of the Norwegian Ski Federation that is responsible for freeski is encouraged to communicate what they expect from a national team athlete exemplified by their cooperation with the Norwegian Olympic Top Sport Centre. In addition, the national team coach can outline the time required and effort needed to develop new skills. All these examples will make the job easier for the elite sport school coaches, when information about the reality of expertise development is available to young athletes. In this way, young athletes have a chance to relate to heroes who work hard *and* have fun.

Limitation and future direction

We aimed at providing insight into the subjective experiences of the predominately hedonic and the predominately eudaimonic athlete in this investigation of coach-athlete relationships. The snowboard/freeski athletes used in this investigation had

stereotypical hedonic aims, and it was easy for us to reveal how challenging it can be for both athletes and coaches in predominantly eudaimonic contexts for elite development. This might be seen as a limitation. However, the methodological approach used with video-based interviews and focus group interviews resulted in a common ground for understanding and discussion of need-support and the endorsement process. In these settings the participants shared experiences that they may not have shared in separate interviews, and this is a strength. Taking this into consideration, we suggest that the above recommendations for coaches in freeski and snowboard may be generalized to other contexts in which predominantly hedonic athletes meet a predominantly eudaimonic sport context. The discrepancies between athletes and their sport contexts may be present in a local or regional sports context as well as in more elite, national, or talent developmental contexts where coaches, parents, and administrators expect athletes to have eudaimonic aims for their sports participation, which then negatively influences predominantly hedonic athletes' enjoyment in sports participation.

An increased understanding of person-environment fit influence on the endorsement process may be an important endeavour for moving SDT-research and coach education forward and improve the psychosocial and performance outcomes in elite sports. Aims can be seen as the deeper reasons to participate in sports rather than the surface content of activities (Huta & Ryan, 2010). Hence, how realistic is successful need-support when context and athlete aims are misaligned? The practical significance of this study is improved knowledge to use as a base for the design of social environments that optimize athletes' development, enjoyment, and well-being.

Conclusion

This novel study aimed to explore athletes' (predominantly hedonic and predominately eudaimonic athlete) and coaches' perceptions of coach need-supportive behaviours to increase our understanding of the athlete-coach dynamic of the endorsement process. A fit between coach and athlete aims result in shared values and meaningfulness of activities, rules, and demands, and makes endorsing possible. Self-endorsement of one's actions can be an important facilitator of positive affect and enjoyment (Ryan & Frederick, 1997). While hedonia relates to the short term/in the moment positive affect, eudaimonia has a cumulative effect on positive affect. This means that working hard can also be *fun* and *enjoyable*. As hedonia and eudaimonia are orthogonal concepts (Huta & Ryan, 2010), the coach needs to know his athlete and trigger/combine the hedonia aspects in daily training. For this to happen, hedonic athletes need to learn, and they would be better off with a broad definition of *fun*, if their aim is to become an elite athlete. One coach-athlete duo who manages this balance is 2017 World champion 400 meter hurdler Karsten Warholm and his coach Svein Olav Alnes. In

interviews, they both stress their unique humour and the fun they both have in the hard work that is their training process. While the coach is being labelled a wizard (Folvik & Strøm, 2017), he simply explains that some laughter and bad jokes take the edge off the toughness and seriousness – which is important for young athletes. For continued involvement in elite sport, this is an important aspect to consider when coaching young athletes. This is a good example of what happens when "have fun" mentality of the athlete meets the "work hard" mentality of the coach–it does not necessarily mean that the athletes' need-satisfaction, commitment, performance, and well-being is always undermined. Thus, coaches should be encouraged to make room for what athletes experience as *fun* in the internalization process. As such, we would argue that there are things to learn from the hedonic athlete as well. After all, it is intrinsic motivation that has the highest quality (Ryan & Deci, 2017). It is important to remember that hedonic aims and eudaimonic aims relate to different forms of well-being empirically and embracing both aims is associated with the greatest well-being (Huta & Ryan, 2010).

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Appendices

Appendix I

Concent from NSD

Consent from NSD

BEKREFTELSE PÅ ENDRINGSMELDING
Hei, viser til endringsmelding registrert hos personvernombudet 29.1.2019.
Vi har nå registrert at Hedda Helene Berntsen er prosjektansvarlig/daglig ansvarlig i prosjektet. Videre at dato for prosjektslutt utsettes til 1.5.2019.
NSD forutsetter at prosjektopplegget for øvrig gjennomføres i tråd med det som tidligere er innmeldt, og NSDs tilbakemeldinger. Vi vil ta ny kontakt ved prosjektslutt.

Pernille Ekornrud Grøndal
rådgiver | Adviser
Seksjon for personverntjenester | Data Protection Services
T: (+47) 55 58 36 41

NSD – Norsk senter for forskningsdata AS | NSD – Norwegian Centre for Research Data
Harald Hårfagres gate 29, NO-5007 Bergen
T: (+47) 55 58 21 17
postmottak@nsd.no www.nsd.no

Appendix II

Information Letter Filming (parents)

Norges idrettshøgskole 10.05.15

Til foreldre og foresatte ved NTG freeski Lillehammer

Frafallet i ungdomsidretten i Norge er norsk idretts største utfordring. NIF og NIF har i samarbeid med NIH satt i gang et forskningsprosjekt som tar høyde for å finne ut mer om linken mellom treneres handlinger og utøveres motivasjon. NTG freeski har stilt med trenere og utøvere for å vise forskjellen på to type trenerstiler. Den første trenerstilen er den der treneren støtter utøverne (god coach). Den andre trenerstilen er en kontrast til den første og kontrollerende (bad coach).

Utdanningsvideoene er laget med formål om å bli brukt i forskningsprosjektet. Dersom forskningen gir gode resultater kan videoene bli brukt på NSF sine hjemmesider.

Vi ber herved om tillatelse til å bruke deres sønn/datter i disse videosnuttene.

Elev navn:

Foresattes underskrift:

Mvh. Hedda Berntsen, PhD student Norges idrettshøgskole

Appendix III

Information Letter (coach)

Forespørsel om deltakelse i forskningsprosjektet:

"Den støttende treneren – hvordan tilrettelegge for motiverte utøvere, trivsel og sportslig utvikling?"

Bakgrunn og formål

Kjære NTG-trenere,

Det er viktig å beholde unge idrettsutøvere lengst mulig i idretten for å sikre optimal talentutvikling. Forskjeller i utøveres motivasjon har stor påvirkning på kvaliteten på treningen, utøvernes evne til å håndtere utfordringer og gleden over å drive med idrett. Som trenere kan dere bidra til å fremme god motivasjon hos utøverne. Deltakelse i denne studien gir deg muligheten for å videreutvikle og sikre "beste praksis" i din treneratferd. Kompetansemateriellet i intervensjonen er basert på den mest oppdaterte kunnskapen om optimal treneratferd for å fremme god motivasjon hos utøvere.

Trenere har grader av kontrollerende og støttende atferd. Formålet med studien er å fremme skitreneres støttende handlinger og den påfølgende kvaliteten på utøveres motivasjon, trivsel og sportslig utvikling. Vi ønsker å måle effekten av din treneratferd på dine utøveres motivasjon, trivsel og sportslige utvikling. Målet med dette forskningsprosjektet er å få bedre kunnskap om sammenhengen mellom treneratferd og utøvermotivasjon, for å kunne designe bedre trenerutdanninger i fremtiden – og forhåpentligvis bidra til økt utvikling hos deres utøvere.

Prosjektet er en doktorgrads-studie som gjennomføres i regi av Norges Idrettshøgskole i samarbeid med Norges Skiforbund og Norges Idrettsforbund. NTG har sagt seg villige til å delta som forsøksskole.

Hva innebærer deltakelse i studien?

Dere blir tilbudt 3 workshops (a 2 timer) og har tilgang til et nettbasert trenerheftet med 7 støttende strategier. Dere blir bedt om å jobbe med én strategi i uken. Etter 4 uker vil vi ha workshop nummer to, der dere presenteres for faktorer som kan virke inn på deres trenerstil, og vi diskuterer med dere om deres erfaringer med strategiene. To måneder etter første workshop oppsummerer vi. Vi ønsker å intervjue noen av dere for å få innblikk i deres erfaring med intervensjonen.

Hva skjer med informasjonen fra studien?

Dataene vil bli analysert ved hjelp av statistiske verktøy for å finne ut om intervensjonen hadde effekt. Alle personopplysninger vil bli behandlet konfidensielt. Det vil bare være forskere i tilknytning til studien som har tilgang til personopplysningene. Disse vil bli anonymisert slik at ikke studiens resultater sier noe om navngitte personer. Alle personopplysninger vil i datainnsamlingsperioden oppbevares både passord-beskyttet og i et låst kontor på tidspunkt dataene ikke analyseres. Deltakerne vil ikke kunne gjenkjenne seg selv i publikasjoner knyttet til studien.

Prosjektet skal etter planen avsluttes i mai 2017. Opptak og data vil bli lagret og anonymisert etter studien er avsluttet. Personopplysningene kodes.

Frivillig deltakelse
Det er frivillig å delta i studien, og du kan når som helst trekke ditt samtykke uten å oppgi noen grunn. Dersom du trekker deg, vil alle opplysninger om deg bli anonymisert.

Dersom du har spørsmål til studien, ta kontakt med Hedda Berntsen (90596890, hedda.berntsen@nih.no).

Studien er meldt til Personvernombudet for Forskning, Norsk Samfunnsvitenskapelig Datatjeneste AS.

Samtykke til deltakelse i studien

Jeg har mottatt informasjon om studien, og er villig til å delta.

(Signert av prosjektdeltaker, dato)

Appendix IV

Information Letter (parents and athletes)

Forespørsel om deltakelse i forskningsprosjektet:

"Den støttende treneren – hvordan tilrettelegge for motiverte utøvere, trivsel og sportslig utvikling?"

Bakgrunn og formål

Kjære NTG-utøvere,

Vi vet at forskjeller i utøveres **motivasjon** har stor påvirkning på kvaliteten på treningen, utøveres evne til å håndtere utfordringer og gleden over å drive med idrett. Trenere kan bidra til å fremme eller undertrykke utøveres motivasjon. Formålet med studien er å fremme skitrenernes støttende handlinger og den påfølgende kvaliteten på motivasjon, trivsel og sportslig utvikling hos utøverne. Vi ønsker derfor å måle effekten av din treners virkninger på din motivasjon, trivsel og sportslige utvikling. Vi håper dette forskningsprosjektet vil gi bedre kunnskap om sammenhengen mellom treneratferd og utøvermotivasjon, for å kunne designe bedre trenerutdanninger i fremtiden – og forhåpentligvis bidra til økt utvikling hos deg som aktiv idrettsutøver.

Prosjektet er en doktorgrads-studie som gjennomføres i regi av Norges Idrettshøgskole i samarbeid med Norges Skiforbund og Norges Idrettsforbund.

NTG har sagt seg villige til å delta som forsøksskole.

Hva innebærer deltakelse i studien?

Dere blir bedt om å svare på et spørreskjema to ganger i løpet av året (2016/17). Spørsmålene handler om hvordan dere opplever trenernes atferd, hvordan dere trives i treningshverdagen og hvilken type motivasjon dere får av treneren deres når dere utøver idretten deres. FIS-punktene deres vil bli hentet ut fra FIS sine sider på ulike tidspunkt i forskningsperioden.

Hva skjer med informasjonen om deg?

Dataene vil bli analysert ved bruk av statistiske verktøy for å finne sammenhengen mellom trenerens atferd og deres motivasjon. Alle personopplysninger vil bli behandlet konfidensielt. Det vil bare være forskere i tilknytning til studien som har tilgang til personopplysningene. Personopplysningene vil bli anonymisert og vil i datainnsamlingsperioden oppbevares både passord-beskyttet og i et låst kontor når dataene ikke analyseres. Deltakerne vil ikke kunne gjenkjenne seg selv i publikasjoner knyttet til studien.

Prosjektet skal etter planen avsluttes i mai 2017. Data vil bli lagret og anonymisert etter studien er avsluttet. Personopplysningene kodes.

Frivillig deltakelse
Det er frivillig å delta i studien, og du kan når som helst trekke ditt samtykke uten å oppgi noen grunn. Dersom du trekker deg, vil alle opplysninger om deg bli anonymisert.

Dersom du har spørsmål til studien, ta kontakt med Hedda Berntsen (90.59.68.90, hedda.berntsen@nih.no).

Studien er meldt til Personvernombudet for forskning, Norsk Samfunnsvitenskapelig Datatjeneste AS.

Samtykke til deltakelse i studien

Jeg har mottatt informasjon om studien, og er villig til å delta.

(Signert av prosjektdeltaker, dato)

For de under 18 år: Som foreldre/verge samtykker jeg på vegne av (navn på utøveren)_____ ja til deltakelse i studien.

(Signeres av foreldre/verge til utøveren, dato)

Appendix V

Interview Guide (coach)

INTERVJUGUIDE TRENERE 8.-10. MAI, 2017

"Small-talk" om trenerens hverdag.

Informasjon om intervjuet og deres rettigheter i forhold til å trekke samtykket: Jeg ønsker å intervjue deg for å få dine tilbakemeldinger på hvordan det var å være med på trenerkurset "den støttende treneren" og få vite mer om hva du synes om læringsmateriellet og hva som kunne bli gjort bedre. Vi håper at dine erfaringer kan gi oss innsikt i hvordan vi kan bedre trenerutdanningen i Norges skiforbund.

Denne samtalen vil bli anonymisert, og du kan trekke tillatelsen når du vil. Det er opp til deg hva du vil fortelle, og det forventes ikke at du skal fortelle noe spesielt, vi er opptatt av din særegne erfaring.

1. Erfaringer med deltakelse på trenerkurset "den støttende treneren"
   Hvordan opplevedes det å være med på intervensjonen?
   Workshop 1 (presentasjon med videoer)
   workshop 2 (kort presentasjon og gruppediskusjoner om implementeringen av strategiene),
   workshop 3 (en-til-en samtaler om opplevelsen av å være med).

2. Erfaringer med læringsmateriellet
   I hvilken grad har du benyttet deg av det digitale trenerhefte i trenerhverdagen din denne sesongen? (teksten, videoene, oppgavene?)
   Hvilke refleksjoner har du gjort deg om trenerheftet?

3. Kan trenerne si noe om hvor lett eller vanskelig det har vært å bruke det de har lært på kurset i sin trenerhverdag? La oss gå gjennom videoene en og en, for så å spørre om dere kan gi noen eksempler på at dere bruker strategiene.
   (Hvor mye har de lært? Husker de videoene? Har de endret noe om hvordan de er som trener etter intervensjonen? (har videoene bekreftet noe dere har gjort intuitivt? Hvordan har dere eventuelt justert hvordan dere er trenere eller begynt å bruke nye strategier?)

4. Forslag til hvordan kurset kunne blitt bedre.
   Hvordan kunne trenerkurset (etterutdannings programmet) blitt bedre? (forslag? Eksempler?)

5. Erfaringer rundt hva som har vært krevende.
   Hva var krevende?

Avslutte med "small-talk" om trening, idrett, og være trener etc.

De støttende trenerstrategiene

1. Anerkjenn utøvernes følelser og /eller perspektiv (tilhørighet)
2. Opptre støtende overfor utøveren (tilhørighet)
3. Gi valgmuligheter innenfor strukturen (autonomi)
4. Gi utøverne gode forklaringer (rasjonale) for oppgaver, regler og begrensinger (struktur) (autonomi)
5. Gi utøverne muligheten til å kunne ta initiativet og jobbe selvstendig i treningshverdagen (autonomi)

6. Gi ikke-kontrollerende mestringsrettede tilbakemeldinger (mestring)
7. Fokuser på egenutvikling og mestring hos utøverne (mestring)

Video 1: Anerkjenn utøvernes følelser og /eller perspektiv (tilhørighet)

- Åpne spørsmål og aktiv lytting
- Emosjonell respons. Vis empati
- Opptre som varm og omsorgsfull overfor utøverne

Kan du gi noen eksempler på at treneren din gjør noen av disse tingene?

Video 2: Opptre støtende overfor utøveren (tilhørighet)

- Vis utøverne at du har tillitt til han/henne
- Unngå å dømme og kritisere utøveren slik at de føler seg skyldige
- Minimer overdreven kontroll av utøverne. Unngå "må," "skal" og håndfaste belønninger.
- Fokuser på innsats og utvikling og bruk ord som "dere kan gjøre," "vil du," "valgene er."

Video 3: Gi valgmuligheter innenfor strukturen (regler og begrensinger), og tydelig ansvar (autonomi)

- Gi utøverne tydelig ansvar
- Involver utøverne i avgjørelsesprosesser og løsningsprosesser som har med idrettsdeltakelsen deres å gjøre (treningsplaner, treningsaktiviteter, hvordan å utvikle teknikken etc.)
- Gi utøverne valgmuligheter i treningshverdagen (vil dere trene intervaller på sykkel eller løping?)

Video 4: Gi utøverne gode forklaringer (rasjonale) for oppgaver, regler og begrensinger (struktur) (autonomi)

- Forklar valgene du tar for utøverne (slalåmtrening, styrketrening, hvorfor knebøy etc.) Selg inn metodene og øvelsene til utøverne.
- Del kunnskap om sporten. Vær kreativ i formidlingen (you tube, artikler, video etc.)

Video 5: Gi utøverne muligheten til å kunne ta initiativet og jobbe selvstendig i treningshverdagen (autonomi)

- Bruk åpne spørsmål for å få utøverne til å foreslå løsninger og føle seg fri til å prøve og feile.
- Oppfordre utøverne til å ta initiativ. Spør for eksempel hvordan de kan oppnå målene på treningene.

Video 6: Gi ikke-kontrollerende mestringsrettede tilbakemeldinger (mestring)

- Gi faktiske ikke-dømmende tilbakemeldinger på utfordringer/problemer (for eksempel: "Du starter svingen litt for tidlig og dette resulterer i at du trykker to ganger.")
- Gi positive tilbakemeldinger som viser høye, men realistiske forventninger.
- Fokuser på aktiviteter som utøverne har kontroll over gjennom optimale utfordringer.

Video 7: Fokuser på egenutvikling og mestring hos utøverne (mestring)

- Sammenlikn utøvernes ferdigheter nå, med deres tidligere ferdigheter
- Fokuser på mestring og innsats i gruppen
- La utøverne sette sine egne mål
- Gi lik oppmerksomhet til utøverne uavhengig av om de er i en god eller dårlig periode. Unngå favorisering.

Appendix VI

Interview Guide (athletes)

INTERVJUGUIDE UTØVERE 8.-10. MAI, 2017

"Small-talk" om utøvernes hverdag.

Informasjon om intervjuet og deres rettigheter i forhold til å trekke samtykket:

Som dere vet har trenerne deres vært med på et trenerkurs forrige høst. Det var i den forbindelse dere har fylt ut spørreskjemaene. Nå ønsker jeg å intervjue dere for å vite mer om hvordan dere opplever treneren deres sine handlinger som støttende eller kontrollerende. Vi ønsker også å bedre forstå de syv støttende strategiene. Vi sal se på syv videosnutter som hver viser ulike strategier.

Denne samtalen vil bli anonymisert, og du kan trekke tillatelsen når du vil. Det er opp til deg hva du vil fortelle, og det forventes ikke at du skal fortelle noe spesielt, vi er opptatt av din særegne erfaring.

1. Utøvernes erfaringer med trenerens atferd.

   Gå gjennom videoene en og en og spør om utøverne kan gi noen eksempler på at treneren deres gjør dette

   Kan dere gi noen eksempler på hva treneren deres gjør? "Good coach" eller "bad coach"?

   (er dette noe han har begynt å gjøre dette det siste året, har han alltid gjort det?). Hvordan påviker trenerens atferd dere?

Avslutt med å takke dem, at dette var alt og uformelt snakke med dem om idretten deres.

Appendix VII

Questionnaire (athlete)

NIH NORGES IDRETTSHØGSKOLE

MOTIVASJON OG OPPLEVELSER PÅ TOPPIDRETTSGYMNAS

SPØRRESKJEMA TIL UTØVERE

2016

INSTRUKSJONER

Vennligst svar på alle spørsmålene så ærlig og nøye som mulig.

Husk at verken treneren din eller noen andre på laget får se skjemaet etter at du har fylt det ut. Det er heller ingen riktige eller gale svar, så svar slik du virkelig føler.

Hvis noe er forvirrende, be om hjelp, så skal vi hjelpe deg.

Mange av spørsmålene handler om din trener, din treningsgruppe eller dine følelser og meninger når du deltar på treninger og renn.

Noen av spørsmålene kan virke veldig like. Det skal de også være.

På forhånd takk for hjelpen!

Nicolas Lemyre,
PhD, Senterleder og 1. Amanuensis
Forskningssenter for Barne- og Ungdomsidrett
Norges Idrettshøgskole

Hedda Berntsen
Forskningssenter for Barne- og Ungdomsidrett
Norges Idrettshøgskole

NAVN: _____

KODE (oppgis senere av forskere): _____

A.

Når vi har trent den siste tiden, er det typisk at treneren min… (helt uenig 1, delvis enig 4, helt enig 7)

1. Ofte spør oss om hva vi foretrekker når det kommer til de aktivitetene vi gjør.

   1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐

2. Oppmuntrer oss til å stole på at vi kan gjennomføre øvelsene bra

   1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐

3. Oppfordrer alltid til å ha gode relasjoner med alle på gruppen

   1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐

4. Prøver å gi oss litt frie tøyler når det gjelder gjennomføringen av øvelsene

   1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐

5. Gir oss oppgaver/utfordringer som er tilpasset vårt ferdighetsnivå

   1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐

6. Oppfordrer til positiv samhandling mellom alle utøverne

   1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐

7. Vurderer våre meninger om øvelsene

   1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐

8. Alltid prøver å hjelpe oss å nå målene våre for de ulike aktivitetene

   1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐

9. Oppfordrer alle utøverne til å involvere seg i aktivitetene

   1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐

10. Oppfordrer oss til å ta egne avgjørelser

    1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐

11. Fremmer utøvernes læring/utvikling og fremgang på ski/snowboard

    1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐

12. Hjelper oss å løse utfordringer på en støttende måte

    1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐

B.

På trening den siste tiden… (helt uenig 1, delvis enig 4, helt enig 7)

1. Følte jeg meg hindret til å velge hvordan jeg lærer best

   1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐

2. Var det situasjoner hvor jeg følte meg ubrukelig

   1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐

3. Følte jeg meg presset til å oppføre meg på visse måter

   1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐

4. Følte jeg meg uønsket av de rundt meg

   1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐

5. Følte jeg meg nødt til å gjøre det noen andre hadde bestemt for meg

   1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐

6. Følte jeg meg utilstrekkelig fordi jeg ikke fikk mulighet til å vise hva jeg er god for

   1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐

7. Følte jeg meg presset til å godta måten treneren min legger opp treningen på

   1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐

8. Følte jeg at treneren og/eller lagkameratene mine behandlet meg som om jeg ikke betydde noe

   1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐

9. Oppsto det situasjoner som fikk meg til å føle at alt var håpløst

   1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐

10. Følte jeg at treneren og /eller lagkameratene mine mislikte meg

    1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐

11. Ble det sagt ting som fikk meg til å føle at jeg presterte skikkelig dårlig

    1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐

12. Følte jeg at lagkameratene mine ble misunnelige når jeg gjorde det bra

    1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐

C.

Under spør vi om hva slags opplevelser du faktisk har i din idrettshverdag. Les spørsmålene nøye. Du kan velge mellom tall fra 1 til 5, for hvorvidt uttalelsen er sann for deg.

1 er lite sann, 3, stemmer delvis, 5 stemmer helt.

1. Jeg føler at jeg har friheten til å velge og jeg har frie tøyler i aktivitetene vi gjør

   1☐ 2☐ 3☐ 4☐ 5☐

2. Det meste av det vi gjør på treninger føler jeg at jeg må gjøre

   1☐ 2☐ 3☐ 4☐ 5☐

3. Jeg føler at de jeg bryr meg om, også bryr seg om meg

   1☐ 2☐ 3☐ 4☐ 5☐

4. Jeg føler meg utestengt fra gjengen jeg helst vil tilhøre

   1☐ 2☐ 3☐ 4☐ 5☐

5. Jeg føler meg trygg på at jeg kan mestre utfordringer vi møter på treningene

   1☐ 2☐ 3☐ 4☐ 5☐

6. Jeg tviler sterkt på hvorvidt jeg kommer til å greie øvelser og aktiviteter på trening og renn

   1☐ 2☐ 3☐ 4☐ 5☐

7. Jeg føler at mine avgjørelser speiler det jeg faktisk ønsker å gjøre

   1☐ 2☐ 3☐ 4☐ 5☐

8. Jeg føler meg presset til å gjøre mange ting jeg ikke selv ville valgt å gjøre

   1☐ 2☐ 3☐ 4☐ 5☐

9. Jeg føler meg knyttet til mennesker som bryr seg om meg, og som jeg bryr meg om

   1☐ 2☐ 3☐ 4☐ 5☐

10. Jeg føler at de personene som er viktige for meg, er kalde og distanserer seg fra meg

    1☐ 2☐ 3☐ 4☐ 5☐

11. Jeg føler jeg er dyktig i det jeg driver med

    1☐ 2☐ 3☐ 4☐ 5☐

12. Jeg føler meg skuffet over mange av mine prestasjoner.

    1☐ 2☐ 3☐ 4☐ 5☐

13. Jeg føler at mine valg viser hvem jeg virkelig er

    1☐ 2☐ 3☐ 4☐ 5☐

14. Jeg føler meg presset til å gjøre for mange ting

    1☐ 2☐ 3☐ 4☐ 5☐

15. Jeg føler nærhet og tilhørighet med andre utøvere og trenere som er viktige for meg

    1☐ 2☐ 3☐ 4☐ 5☐

16. Jeg har en følelse av at de jeg tilbringer tid med misliker meg

    1☐ 2☐ 3☐ 4☐ 5☐

17. Jeg føler jeg er god nok til å oppnå målene mine

    1☐ 2☐ 3☐ 4☐ 5☐

18. Jeg føler meg usikker på mine ferdigheter

    1☐ 2☐ 3☐ 4☐ 5☐

19. Jeg føler jeg har gjort det som virkelig interesserer meg

    1☐ 2☐ 3☐ 4☐ 5☐

20. Mine daglige gjøremål føles som en lang rekke plikter

    1☐ 2☐ 3☐ 4☐ 5☐

21. Jeg opplever varme fra og med de jeg bruker tid sammen med

    1☐ 2☐ 3☐ 4☐ 5☐

22. Jeg føler mine vennskap er overflatiske

    1☐ 2☐ 3☐ 4☐ 5☐

23. Jeg føler at jeg kan gjennomføre vanskelige oppgaver på en tilfredsstillende måte

    1☐ 2☐ 3☐ 4☐ 5☐

24. Jeg føler meg mislykkes på grunn av de feilene jeg gjør

    1☐ 2☐ 3☐ 4☐ 5☐

D.

Rapporter i hvilken grad argumentene under samsvarer med dine personlige grunner/din motivasjon for å være en aktiv idrettsutøver.

Marker på en skala fra 1 til 7, der 1 = samsvarer absolutt ikke, 7 = samsvarer perfekt.

1. Det gir meg glede å lære mer om idretten min.
   1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐
2. Å bedrive idrett gjenspeiler essensen av hvem jeg er
   1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐
3. Idrett er en av de beste måtene jeg har valgt for å utvikle andre sider ved meg selv
   1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐
4. Det er veldig interessant å lære hvordan jeg kan forbedre meg
   1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐
5. Det er ikke klart for meg lenger om min plass virkelig er i idretten
   1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐
6. Jeg har valgt denne idretten som en måte å utvikle meg selv
   1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐
7. Mennesker rundt meg belønner meg når jeg gjør driver med idrett
   1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐
8. Jeg synes idrett er en god måte å utvikle sider ved meg selv som jeg verdsetter
   1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐
9. Jeg ville føle meg mindre verdt om jeg ikke drev aktiv idrett
   1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐
10. Mennesker jeg bryr meg om ville blitt opprørt om jeg ikke var en aktiv idrettsutøver
    1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐
11. Gjennom idrett lever jeg i tråd med mine dypeste prinsipper
    1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐
12. Det er gøy å oppdage nye strategier for å prestere
    1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐

13. Jeg tror andre ville mislike meg hvis jeg ikke drev med idrett
    1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐

14. Jeg føler meg bedre når jeg er en aktiv idrettsutøver
    1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐

15. Jeg har hatt gode grunner for å være aktiv utøver, men nå spør jeg meg selv om jeg skal fortsette
    1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐

16. Jeg ville føle meg dårlig om jeg ikke tok meg tid til å drive med idrett.
    1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐

17. Jeg vet ikke lenger; jeg har inntrykk av at jeg ikke er i stand til å lykkes i denne idretten
    1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐

18. Deltakelse i idrett er en vesentlig del av livet mitt
    1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐

E.

Besvar på en skala fra 1 til 7 i hvilken grad du er uenig eller enig i følgende 5 påstander angående livet ditt de siste syv dagene. Det gjør du ved å sette kryss i en av boksene med numrene fra 1 til 7, hvor:

1 betyr: "Jeg er veldig uenig,"

2 betyr: "Jeg er uenig,"

3 betyr: "Jeg er litt uenig,"

4 betyr: "Jeg er verken enig eller uenig,"

5 betyr: "Jeg er litt enig,"

6 betyr: "Jeg er enig,"

7 betyr: "Jeg er veldig enig."

1. Livet mitt er på de fleste områder ideelt

1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐

2. Omstendighetene rundt livet mitt er perfekte

1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐

3. Jeg er fornøyd med livet mitt

1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐

4. Så langt har jeg oppnådd viktige ting jeg har villet med livet mitt

1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐

5. Hvis jeg kunne leve om igjen, ville jeg nesten ikke forandret noen ting

1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐

F.

Dette skjemaet består av en rekke ord og uttrykk som beskriver ulike følelser. Se på hver enkelt av disse og angi for hvert enkelt ord/uttrykk i hvor stor grad du har opplevd denne følelsen i løpet av de siste syv dagene. Det gjør du ved å sette kryss i en av boksene med numrene fra 1 til 5, hvor

1 betyr: "Jeg har opplevd denne følelsen svært lite,"

2 betyr: "Jeg har opplevd denne følelsen litt,"

3 betyr: "Jeg har opplevd denne følelsen moderat ofte,"

4 betyr: "Jeg har opplevd denne følelsen ganske mye,"

5 betyr: "Jeg har opplevd denne følelsen svært mye."

	1	2	3	4	5
Redd Oppmerksom Fiendtlig Interessert					
Aktiv					
Skjelven Spent Oppskjørtet (stresset) Frykt Bestemt Skyldig					
Stolt					
Oppvakt/klar.					
Irritabel Inspirert					

Stresset Nervøs					
Entusiastisk Skamfull					
Sterk					

G.

Besvar på en skala fra 1 til 7 i hvilken grad du er enig eller uenig i følgende påstander når du har trent de siste syv dagene. Det gjør du ved å sette kryss i en av boksene med numrene fra 1 til 7, hvor:

1 betyr: "Jeg er veldig uenig,"

2 betyr: "Jeg er uenig,"

3 betyr: "Jeg er litt uenig,"

4 betyr: "Jeg er verken enig eller uenig,"

5 betyr: "Jeg er litt enig,"

6 betyr: "Jeg er enig,"

7 betyr: "Jeg er veldig enig."

1. Jeg føler meg full av liv og overskudd

1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐

2. Jeg har ikke følt meg særlig energisk

1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐

3. Noen ganger har jeg følt meg så energisk at jeg nesten sprekker

1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐

4. Jeg har energi og overskudd

1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐

5. Jeg ser frem til hver eneste trening

1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐

6. Jeg føler meg nesten alltid våken og "på hugget"

1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐

7. Jeg føler meg aktiv

1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐

H.

Instruksjon: Under finner du en liste med påstander om dine generelle følelser om deg selv.

Hvis du er helt enig, sett ring rundt HE.

Hvis du er enig, sett ring rundt E.

Hvis du er uenig, sett ring rundt U.

Hvis du er helt uenig, sett ring rundt HU.

1. Jeg er i det store og hele fornøyd med meg selv HE E U HU
2. Noen ganger tenker jeg at jeg ikke er noe god i det hele tatt. HE E U HU
3. Jeg føler at jeg har mange gode kvaliteter. HE E U HU
4. Jeg er i stand til å gjøre ting like bra som de fleste andre. HE E U HU
5. Jeg føler at jeg ikke har mye å være stolt over. HE E U HU

6. Jeg føler meg til tider helt ubrukelig. HE E U HU

7. Jeg føler meg verdifull, i hvert fall på lik linje med andre. HE E U HU

8. Jeg kunne ønske jeg hadde mer respekt for meg selv. HE E U HU

9. Stort sett heller jeg mot å føle meg som en taper. HE E U HU

10. Jeg har en positiv innstilling til meg selv. HE E U HU

I.

Til hvilken grad tilnærmer du deg dine ski/snowboard-aktiviteter med disse intensjonene, enten du faktisk oppnår dine mål eller ikke.

Ranger utsagnene fra 1 (ikke i det hele tatt) til 7 (veldig mye)

Jeg.....

1. Jobber med å oppnå et personlig ideal?

1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐

2. Jobber med å strekke deg mot det beste i deg selv?

1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐

3. Jobber med å utvikle en ferdighet, lære, eller få innsikt i noe?

1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐

4. Jobber med å gjøre det du har tro på?

1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐

5. Ønsker fornøyelse?

1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐

6. Ønsker tilfredstillelse?

1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐

7. Ønsker å ha det gøy?

1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐

8. Ønsker mental avkobling (å slappe av)?

1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐

9. Ønsker å ta det med ro?

1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐

Appendix VIII

The digital workbook

DEN STØTTENDE TRENEREN

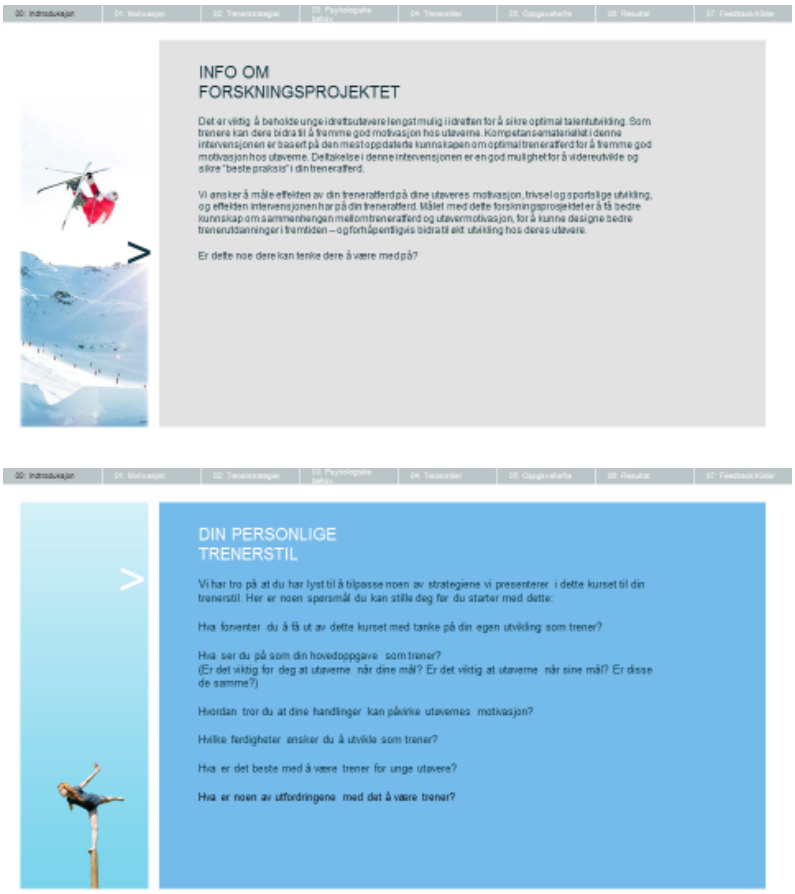
Hvordan tilrettelegge for motiverte utøvere, trivsel og sportslig utvikling?

INFO OM FORSKNINGSPROJEKTET

Det er viktig å beholde unge idrettsutøvere lengst mulig i idretten for å sikre optimal talentutvikling. Som trenere kan dere bidra til å fremme god motivasjon hos utøverne. Kompetansematerialet i denne intervensjonen er basert på den mest oppdaterte kunnskapen om optimal treneratferd for å fremme god motivasjon hos utøverne. Deltakelse i denne intervensjonen er en god mulighet for å videreutvikle og sikre "beste praksis" i din treneratferd.

Vi ønsker å måle effekten av din treneratferd på dine utøveres motivasjon, trivsel og sportslige utvikling, og effekten intervensjonen har på din treneratferd. Målet med dette forskningsprosjektet er å få bedre kunnskap om sammenhengen mellom treneratferd og utøvermotivasjon, for å kunne designe bedre trenerutdanninger i fremtiden – og forhåpentligvis bidra til økt utvikling hos deres utøvere.

Er dette noe dere kan tenke dere å være med på?



DIN PERSONLIGE TRENERSTIL

Vi har tro på at du har lyst til å tilpasse noen av strategiene vi presenterer i dette kurset til din trenerstil. Her er noen spørsmål du kan stille deg før du starter med dette:

Hva forventer du å få ut av dette kurset med tanke på din egen utvikling som trener?

Hva ser du på som din hovedoppgave som trener?
(Er det viktig for deg at utøverne når dine mål? Er det viktig at utøverne når sine mål? Er disse de samme?)

Hvordan tror du at dine handlinger kan påvirke utøvernes motivasjon?

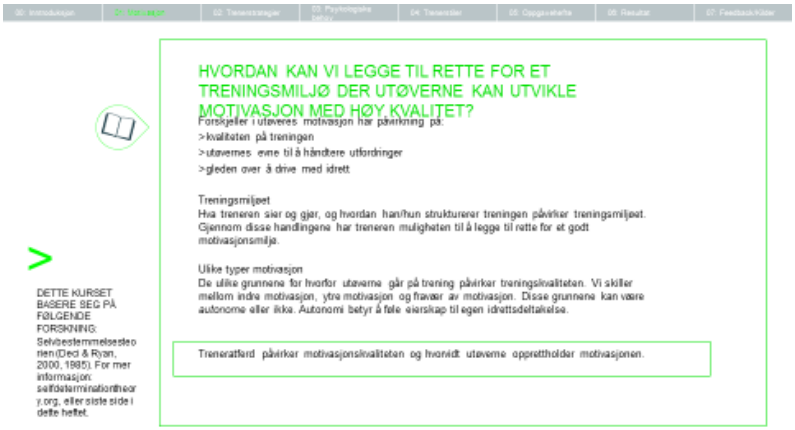
Hvilke ferdigheter ønsker du å utvikle som trener?

Hva er det beste med å være trener for unge utøvere?

Hva er noen av utfordringene med det å være trener?


AVGJØRENDE FAKTORER
FOR SPORTSLIG UTVIKLING
Sportslig utvikling er for mange trenere selve essensen ved trenerrollen. Det er mange faktorer som påvirker den sportslige utviklingen. Historisk sett har fokuset på tekniske og taktiske ferdigheter vært dominerende.
De senere årene har forskning begynt å utforske de psyko-sosiale faktorenes betydning for den sportslige utviklingen. Vi vet at motivasjon har sterk betydning for læring og utvikling. Vi vet nå at uten motivasjon til å gjennomføre den nødvendige treningen med høy kvalitet, vil ikke utviklingen bli optimal.
DETTE KURSET ER DELT INN I TO DELER.
Del en handler om teorien bak det trenerskapte motivasjonsklimaet. (Kapittel01, 02, 03, 04)
I del to presenteres de støttende trenerstrategiene og oppgaver knyttet til hver av disse. (Kapittel05, 06, 07)


01:
MOTIVASJON
Motivasjon er bevegelsesenergi. Å være motivert betyr at man har drivkraft til å gjennomføre handlinger.
Forskning på idrettsutøveres motivasjon er opptatt av å utforske spørsmålene: "Hva aktiverer og gir retning til utøvernes handlinger? " og "hvordan opprettholdes utøveres motivasjon over tid?".


HVORDAN KAN VI LEGGE TIL RETTE FOR ET TRENINGSMILJØ DER UTØVERNE KAN UTVIKLE MOTIVASJON MED HØY KVALITET?
Forskjeller i utøveres motivasjon har påvirkning på:
>kvaliteten på treningen
>utøvernes evne til å håndtere utfordringer
>gleden over å drive med idrett
Treningsmiljøet
Hva treneren sier og gjør, og hvordan han/hun strukturerer treningen påvirker treningsmiljøet. Gjennom disse handlingene har treneren muligheten til å legge til rette for et godt motivasjonsmiljø.
Ulike typer motivasjon
De ulike grunnene for hvorfor utøverne går på trening påvirker treningskvaliteten. Vi skiller mellom indre motivasjon, ytre motivasjon og fravær av motivasjon. Disse grunnene kan være autonome eller ikke. Autonomi betyr å føle eierskap til egen idrettsdeltakelse.
Treneratferd påvirker motivasjonskvaliteten og hvorvidt utøverne opprettholder motivasjonen.
DETTE KURSET BASERE SEG PÅ FØLGENDE FORSKNING: Selvbestemmelsesteorien (Deci & Ryan, 2000, 1985). For mer informasjon: selfdeterminationtheory.org, eller siste side i dette heftet.

Indre motivasjon handler om motivasjonen for å gjøre noe for sin egen del. Indre motiverte handlinger oppleves som gøy, og gledelig i seg selv. Den indre gleden eller nytelsen i aktiviteten kan ha tre ulike former:
1. "Å føle", kan inntre når en skikjører gleder seg over farten i løypen eller føler gleden av å være i balanse i luften. Denne formen for indre motivasjon kan omtales som bevegelsesglede og er basert på sansestimulering.
2. "Å forstå", eller gleden over å lære kan inntre når utøveren plutselig forstår sammenhengen mellom skikjøringen og hvordan kreftene i svingen virker på kroppen. Skikjøreren opplever å forstå noe nytt og får "a-ha" opplevelsen.
3. "Å mestre" handler om gleden ved å mestre en krevende løype, en vanskelig kombinasjon eller andre ferdigheter skikjøreren har øvd seg på. Vi omtaler ofte denne formen for indre motivasjon som mestringsglede.

De fleste utøverne starter med idrett fordi det er gøy, og det er den indre motivasjonen som har høyest kvalitet.
Når opplever dine utøvere at idretten sin er gøy?
Hva kan du gjøre for at utøverne opprettholder denne type motivasjon?

Ytre motivasjon handler om når vi gjør ting for å oppnå belønning eller unngå straff.

Fravær av motivasjon er når utøverne ikke lenger har noen gode grunner for hvorfor de driver med idrett, og det fører ofte til at de ikke vil drive med idrett lenger.

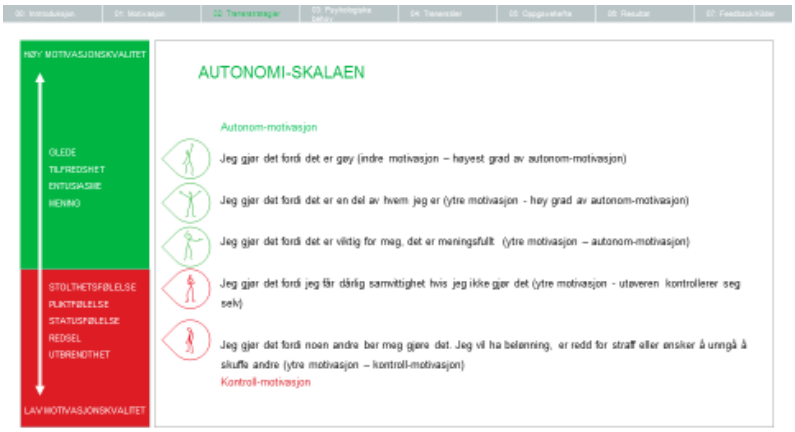
De indre og ytre grunnene for hvorfor utøverne trener kan variere på en skala, fra at utøverne føler seg ansvarlige for egne handlinger (autonom-motivasjon), til at utøverne føler seg manipulert til å handle (kontroll-motivasjon).

Autonom-motivasjon
Når utøverne går på trening fordi det er gøy og viktig for dem - de har lyst til å gå på trening! Denne formen for motivasjonen kaller vi autonom, da opplever utøveren å ha eierskap til egen idrettshverdag. Jo større grad av autonom motivasjon, jo sterkere er kvaliteten på motivasjonen

"Jeg driver med idrett fordi det er gøy"
"Jeg driver med ski fordi det er en viktig del av min identitet"
"Jeg trener styrke fordi det er viktig for meg å bli sterkere, så jeg kan utvikle meg som skikjører"
"Jeg gjør det fordi jeg vil prestere bra"

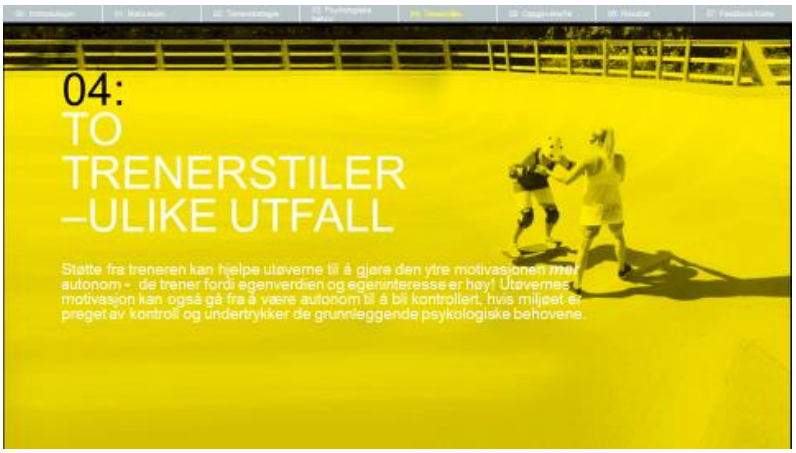
Kontroll-motivasjon
Når utøverne går på trening fordi de føler de må, fordi det venter straff eller belønninger – dette kaller vi kontroll-motivasjon. Dette kan være trenere eller foreldres ønske om at utøveren bør trene hardt, andres verdier eller forventninger i det sosiale miljøet. Hvis utøveren er redd for å skuffe treneren eller andre sier vi at utøveren er kontroll-motivert. Utøveren handler da på bakgrunn av andres ønske eller press. Utøverne kan også legge negativt press på seg selv gjennom dårlig samvittighet og en følelse av at dette er noe de må gjøre. Dette er en sårbar form for motivasjon med lav kvalitet.

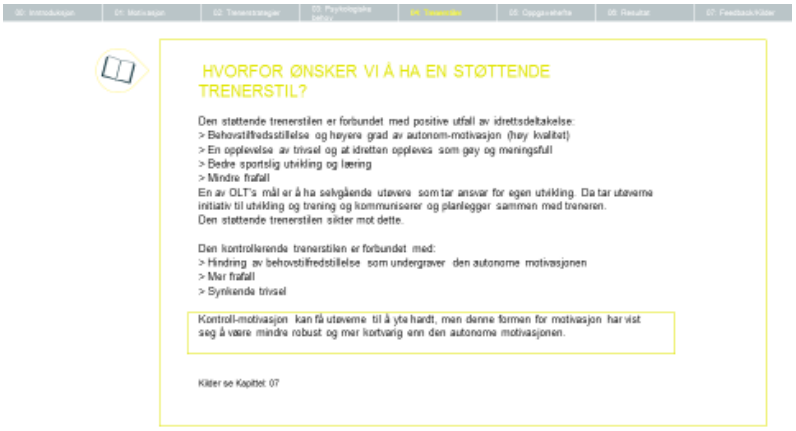
"Jeg gjør dette for ikke å skuffe treneren min"
"Jeg trener hardt for ikke å bli straffet eller få kjeft"
"Jeg står på ski fordi Pappa blir stolt av meg."
"Jeg kjører fire runder til for ikke å få dårlig samvittighet"


HØY MOTIVASJONSKVALITET
GLEDE
TILFREDSHET
ENTUSIASME
MENING
STOLTHETSFØLELSE
PLIKTFØLELSE
STATUSFØLELSE
REDSEL
UTBRENTHET
LAV MOTIVASJONSKVALITET
AUTONOMI-SKALAEN
Autonom-motivasjon
Jeg gjør det fordi det er gøy (indre motivasjon – høyest grad av autonom-motivasjon)
Jeg gjør det fordi det er en del av hvem jeg er (ytre motivasjon - høy grad av autonom-motivasjon)
Jeg gjør det fordi det er viktig for meg, det er meningsfullt (ytre motivasjon – autonom-motivasjon)
Jeg gjør det fordi jeg får dårlig samvittighet hvis jeg ikke gjør det (ytre motivasjon - utøveren kontrollerer seg selv)
Jeg gjør det fordi noen andre ber meg gjøre det. Jeg vil ha belønning, er redd for straff eller ønsker å unngå å skuffe andre (ytre motivasjon – kontroll-motivasjon)
Kontroll-motivasjon


03:
DE TRE GRUNNLEGGENDE PSYKOLOGISKE BEHOVENE
Mennesker har et iboende ønske om å søke utvikling, men da må de grunnleggende psykologiske behovene være tilfredsstilt. For å opprettholde utvikling og trivsel trenger man psykologisk næring. Vi har behov for å oppleve tilhørighet til vårt sosiale miljø, å føle oss kompetente og oppleve eierskap i treningshverdagen. Tilfredsstillelsen av de grunnleggende psykologiske behovene er spesielt viktig for å utvikle autonom motivasjon. Treningsmiljøet kan enten undertrykke eller gi støtte til disse behovene.


Behovet for autonomi
Behovet for å føle mestring


04:
TO
TRENERSTILER
–ULIKE UTFALL
Støtte fra treneren kan hjelpe utøverne til å gjøre den ytre motivasjonen mer autonom - de trener fordi egenverdien og egeninteresse er høy! Utøvernes motivasjon kan også gå fra å være autonom til å bli kontrollert, hvis miljøet er preget av kontroll og undertrykker de grunnleggende psykologiske behovene.


HVORFOR ØNSKER VI Å HA EN STØTTENDE TRENERSTIL?
Den støttende trenerstilen er forbundet med positive utfall av idrettsdeltakelse:
> Behovstilfredsstillelse og høyere grad av autonom-motivasjon (høy kvalitet)
> En opplevelse av trivsel og at idretten oppleves som gøy og meningsfull
> Bedre sportslig utvikling og læring
> Mindre frafall
En av OLT's mål er å ha selvgående utøvere som tar ansvar for egen utvikling. Da tar utøverne initiativ til utvikling og trening og kommuniserer og planlegger sammen med treneren.
Den støttende trenerstilen sikter mot dette.
Den kontrollerende trenerstilen er forbundet med:
> Hindring av behovstilfredsstillelse som undergraver den autonome motivasjonen
> Mer frafall
> Synkende trivsel
Kontroll-motivasjon kan få utøverne til å yte hardt, men denne formen for motivasjon har vist seg å være mindre robust og mer kortvarig enn den autonome motivasjonen.
Kilder se Kapittel 07


05:
OPPGAVEHEFTE
DE STØTTENDE
TRENERSTRATEGIENE

DE STØTTENDE TRENERSTRATEGIENE

1. Anerkjenne utøvernes følelser og/eller perspektiv (støtter behovet for tilhørighet)
2. Opptre støttende overfor utøveren (støtter behovet for tilhørighet)
3. Gi valgmuligheter innenfor strukturen (regler og begrensinger), og tydelig ansvar (støtte til behovet for autonomi)
4. Gi utøverne gode forklaringer (rasjonale) for oppgaver, regler og begrensinger (struktur) (støtte til behovet for autonomi)
5. Gi utøverne muligheten til å kunne ta initiativet og jobbe selvstendig i treningshverdagen (støtte til behovet for autonomi)
6. Gi ikke-kontrollerende mestringsrettede tilbakemeldinger (støtte til behovet for å føle mestring)
7. Fokusere på egenutvikling og mestring hos utøverne (støtte til behovet for å føle mestring)

I etterkant av hver strategi kan dere planlegge hvordan dere kan bruke strategien i noen tenkte situasjoner. Ved å gjøre dette vil det være større sannsynlighet for at dere kommer til å handle støttende overfor utøverne deres, på bakgrunn av at nye koblinger i hjernen allerede er påbegynt.

05.01<OPPGAVER
HVORDAN Å ANNERKJENNE UTØVERNES FØLELSER OG/ELLER PERSPEKTIV?

a> Åpne spørsmål og aktiv lytting (Har jeg forstått deg rett? Er dette det du sa?)
a> Emosjonell respons: Vis empati
a> Opptre som varm og omsorgsfull overfor utøverne

For å skape en følelse av tilhørighet i gruppen, kan du legge til rette for at utøverne kan være sosiale i forbindelse med treninger og samlinger.
Før trening:
Skriv ned hva du vil gjøre på treningen i dag for å anerkjenne utøveres følelser og perspektiv.
Hvis x (utøverens handling) inntrer, da skal jeg gjøre y (din handling).

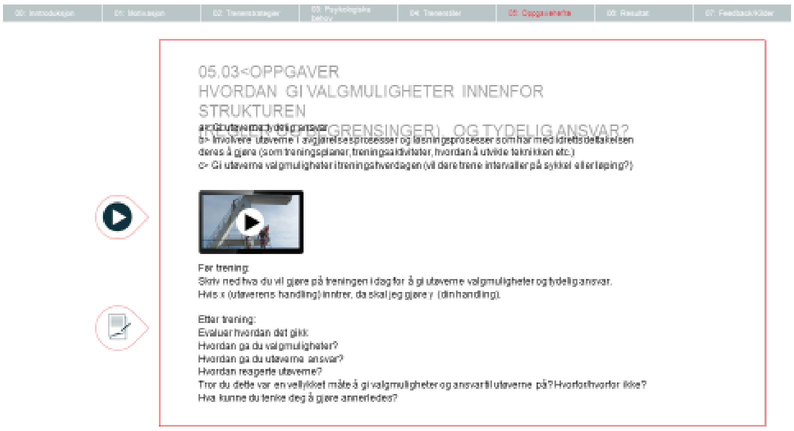
Etter trening:
Evaluer hvordan det gikk.
Hvordan reagerte utøverne?
Hvordan anerkjente du utøvernes følelser?
Tror du at du klarte å anerkjenne utøvernes følelser og perspektiv? Hvorfor/hvorfor ikke?
Hva kunne du tenke deg å gjøre annerledes?

05.02<OPPGAVER
HVORDAN OPPTRE STØTTENDE OVERFOR UTØVEREN?

a> Vis utøveren at du har tillit til hans/hennes
a> Unngå å dømme og kritisere utøveren slik at de føler seg skyldige
a> Minimer overdreven kontroll av utøverne. Unngå "må", "skal", og håndfaste belønninger.
Fokuser på innsats og utvikling og bruk ord som "dere kan gjøre", "vil du", "valgene er".

Før trening:
Skriv ned hva du vil gjøre på treningen i dag for å være støttende.
Hvis x (utøverens handling) inntrer, da skal jeg gjøre y (din handling).

Etter trening:
Hvordan var du støttende?
Hvordan reagerte utøverne?
Tror du at du klarte å opptre støttende overfor utøveren? Hvorfor/hvorfor ikke?
Hvordan viste du utøverne tillit?
Hva kunne du tenke deg å gjøre annerledes?


05.03<OPPGAVER
HVORDAN GI VALGMULIGHETER INNENFOR STRUKTUREN
b> Involvere utøverne i avgjørelsesprosesser og løsningsprosesser som har med idrettsdeltakelsen deres å gjøre (som treningsplaner, treningsaktiviteter, hvordan å utvikle teknikken etc.)
c> Gi utøverne valgmuligheter i treningshverdagen (vil dere trene intervaller på sykkel eller løping?)
Før trening:
Skriv ned hva du vil gjøre på treningen i dag for å gi utøverne valgmuligheter og tydelig ansvar.
Hvis x (utøverens handling) inntrer, da skal jeg gjøre y (din handling).
Etter trening:
Evaluer hvordan det gikk:
Hvordan ga du valgmuligheter?
Hvordan ga du utøverne ansvar?
Hvordan reagerte utøverne?
Tror du dette var en vellykket måte å gi valgmuligheter og ansvar til utøverne på? Hvorfor/hvorfor ikke?
Hva kunne du tenke deg å gjøre annerledes?


05.04<OPPGAVER
HVORDAN Å GI UTØVERNE GODE FORKLARINGER (RASJONALE)
FOR OPPGAVER, REGLER OG BEGRENSINGER
Et eksempel vi kan bruke er hvordan du forklarer unge utøvere hvorfor de må stå opp tidlig og trene store mengder med kvalitet. Det er viktig at det blir formidlet hva som forventes av dem og hvorfor dette er viktig, når de går på et skigymnas. Dette er implementering av struktur. En utfordring kan være at ulike utøvere opplever struktur ulikt. Det er mulig at noen utøvere opplever strukturen du skaper som kontrollerende. Det er ekstra viktig å kommunisere godt hvorfor du handler som du gjør i en slik situasjon.
b> Del kunnskap om sporten. Forskjellige ting trigger utøverne. Vær kreativ i formidlingen (youtube, foredrag om visualisering, en god film om idrettsutøvere som hadde en lang vei til toppen, bøker, intervjuer, artikler, blader etc.)


05.04<OPPGAVER
Hvor går grensen mellom kontroll og struktur? Den relative kontrollerende trenerstilen: Treneren setter agendaen og utøverne forventes og følge denne blindt. De bruker ofte ytre motivasjon, som normativ ros foran andre, belønning, tvang og spiller på dårlig samvittighet for å få utøverne til å gjøre som de vil. Den relativ støttende treneren oppfordrer utøverne til å oppsøke sine egne agendaer og mål, støtter utøvernes initiativ og indre motivasjon ("fett at du digger frikjøring, viktig at du fortsetter med det"). Det er lett å falle tilbake på kontroll når vi anser vår agenda som viktigere enn utøverens agenda. Ved å anse utøvernes agenda som den viktige, kan vi unngå mye unødig kontroll.
Før trening:
Skriv ned hva du vil gjøre på treningen i dag for å forklare hvorfor dere trener.
Hvis x (utøverens handling) inntrer, da skal jeg gjøre y (din handling).
Etter trening:
Evaluer hvordan det gikk:
Hvordan forklarte du dine valg av øvelser på trening i dag?
Hvordan delte du kunnskap om alpint?
Hvordan reagerte utøverne?
Tror du at du klarte å gi et godt rasjonale? Hvorfor/hvorfor ikke?
Hva kunne du tenke deg å gjøre annerledes?

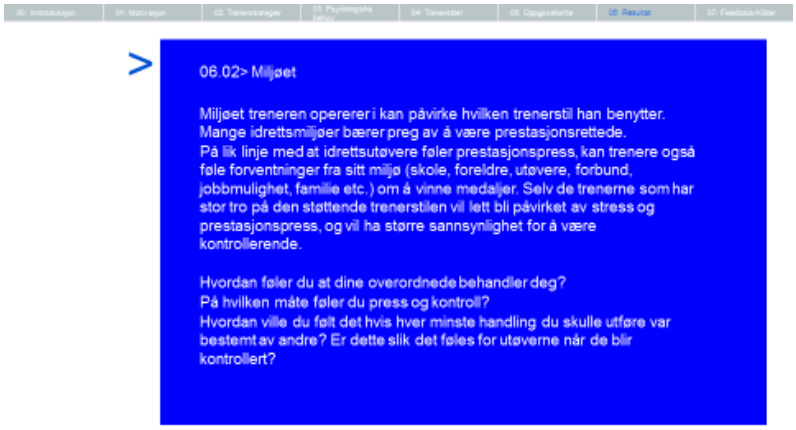

05.05<OPPGAVER
HVORDAN Å GI UTØVERNE MULIGHETEN TIL Å KUNNE TA INITIATIVET OG JOBBE SELVSTENDIG I TRENINGSHVERDAGEN?
a> Bruk spørsmål for å la utøverne få forestå løsninger og feile seg fri til å prøve og feile.
b> Oppfordre utøverne til å ta initiativ. Spør hvordan de kan oppnå målene sine for treningen.
Før trening:
Skriv ned hva du vil gjøre på treningen for å oppfordre utøverne til å ta initiativ på treningen. Hvis x (utøverens handling) inntrer, da skal jeg gjøre y (din handling).
Etter trening:
Evaluer hvordan det gikk.
Hva gjorde du for å oppfordre til initiativtaking og selvstendig jobbing på trening?
Hvordan reagerte utøverne?
Tror du at du greide å oppfordre utøverne til å ta initiativet på treningene? Hvorfor/hvorfor ikke?
Hva kunne du tenke deg å gjøre annerledes?

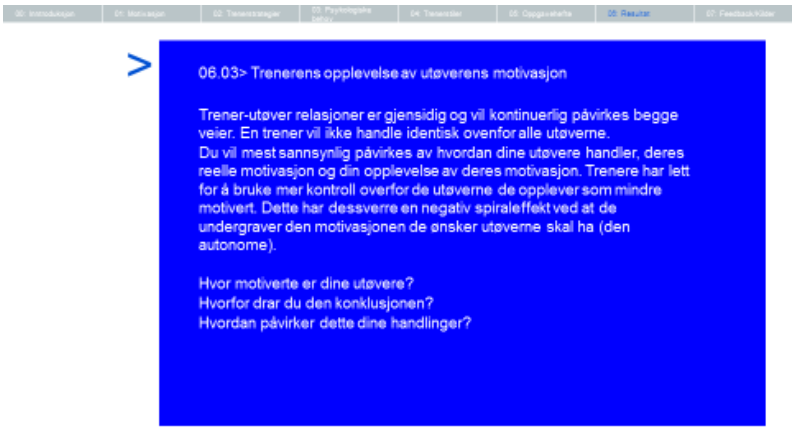

05.06<OPPGAVER
HVORDAN Å GI IKKE-KONTROLLERENDE MESTRINGSRETTEDE TILBAKEMELDINGER?
a> Gi mestringsrettede tilbakemeldinger på utfordringsproblemer (eksempel: "Du starter svingen litt for tidlig og dette resulterer i at du trykker to ganger").
b> Gi positive tilbakemeldinger som viser høye, men realistiske forventninger
c> Fokuser på handlingsrelatert utfordringer som utøverne har kontroll over gjennom optimale utfordringer.
Før trening:
Skriv ned hva du vil gjøre på treningen i dag for å gi ikke-kontrollerende mestringsrettede tilbakemeldinger.
Hvis x (utøverens handling) inntrer, da skal jeg gjøre y (din handling).
Etter trening:
Evaluer hvordan det gikk.
Hvordan ga du mestringsrettede tilbakemeldinger?
Hva gjorde du for å gi optimale utfordringer for hver enkelt?
Hvordan reagerte utøverne?
Tror du at du greide å gi mestringsrettede tilbakemeldinger? Hvorfor/hvorfor ikke?
Hva kunne du tenke deg å gjøre annerledes?


05.07<OPPGAVER
HVORDAN Å FOKUSERE PÅ EGENUTVIKLING OG MESTRING HOS UTØVERNE?
a> Sammenlikn utøvernes ferdigheter nå, med deres tidligere ferdigheter.
b> Fokuser på mestring og innsats i gruppen.
c> La utøverne sette sine egne mål.
d> Gi lik oppmerksomhet til utøverne uavhengig av om de er i en god eller dårlig periode. Unngå favorisering.
Før trening:
Skriv ned hva du vil gjøre på treningen i dag for å fokusere på egenutvikling og mestring hos utøverne.
Hvis x (utøverens handling) inntrer, da skal jeg gjøre y (din handling).
Etter trening:
Evaluer hvordan det gikk.
Hva gjorde du for å sammenlikne utøvernes ferdigheter med deres egne?
Hvordan fokuserte du på mestring og innsats i gruppen?
Hvordan jobber dere med målsetting?
Hvordan unngår du favorisering?
Hvordan reagerte utøverne?
Tror du at du greide å unngå ego-involvering? Hvorfor/hvorfor ikke?
Hva kunne du tenke deg å gjøre annerledes?


06:
FAKTORER SOM SPILLER INN PÅ TRENERENS HANDLINGER


06.01> Trenerens personlige syn på hva som er gode motivasjonsstrategier
Hva trenere tror har effekt på hva som påvirker utøverens motivasjon, har stor innvirkning på hvordan de handler som trenere. I vesten dominerer fortsatt synet på at belønning og straff er gode motivasjonsstrategier. Selv stadig nye forskningsrapporter støtter synet på at den støttende trenerstilen påvirker utøveres motivasjon positivt, vil trenere med et tradisjonelt syn på belønning og straff ha vanskeligere for å lære støttende strategier. Mange trenere tar i bruk en kontrollerende trenerstil fordi de (feilaktig) tror at den vil gi bedre resultater.
Hva tenker du om de ulike trenerstilene? Den du har mest tro på er mest sannsynlig den stilen du bruker.


06.02> Miljøet
Miljøet treneren opererer i kan påvirke hvilken trenerstil han benytter. Mange idrettsmiljøer bærer preg av å være prestasjonsrettede.
På lik linje med at idrettsutøvere føler prestasjonspress, kan trenere også føle forventninger fra sitt miljø (skole, foreldre, utøvere, forbund, jobbmulighet, familie etc.) om å vinne medaljer. Selv de trenerne som har stor tro på den støttende trenerstilen vil lett bli påvirket av stress og prestasjonspress, og vil ha større sannsynlighet for å være kontrollerende.
Hvordan føler du at dine overordnede behandler deg?
På hvilken måte føler du press og kontroll?
Hvordan ville du følt det hvis hver minste handling du skulle utføre var bestemt av andre? Er dette slik det føles for utøverne når de blir kontrollert?


06.03> Trenerens opplevelse av utøverens motivasjon
Trener-utøver relasjoner er gjensidig og vil kontinuerlig påvirkes begge veier. En trener vil ikke handle identisk ovenfor alle utøverne.
Du vil mest sannsynlig påvirkes av hvordan dine utøvere handler, deres reelle motivasjon og din opplevelse av deres motivasjon. Trenere har lett for å bruke mer kontroll overfor de utøverne de opplever som mindre motivert. Dette har dessverre en negativ spiraleffekt ved at de undergraver den motivasjonen de ønsker utøverne skal ha (den autonome).
Hvor motiverte er dine utøvere?
Hvorfor drar du den konklusjonen?
Hvordan påvirker dette dine handlinger?


07:
DEN GODE TRENEREN, MULTIKUNSTNEREN
Det ikke nok å utøve og utvikle de støttende-strategiene. En bred forståelse for andre områder av treneryrket som teknisk, taktisk, mental og fysisk utvikling er essensielt. Men, bevissthet rundt egen praksis som trener og hvordan noen sider ved din trenerstil kan være med på å forsterke eller svekke utøvernes motivasjon er helt avgjørende.


SYV HJELPEPUNKTER
1. Tilbakemeldinger
2. Møter
3. Involvering
4. Fellesmøter
5. Konkurransesituasjon
6. Instruksjonssituasjon
7. Struktur
TRENEREN, EN MULTIKUNSTNER
De støttende strategiene vil bli optimalisert hvis dere identifiserer individuelle forskjellerbehov hos utøverne og tilpasser disse til de ulike situasjonene. Dette er lettere sagt enn gjort. Ved å ha kjennskap til hva hver enkelt utøver opplever som interessant og meningsfullt, vil du bedre kunne legge til rette for at den enkelte utøver utvikler autonom-motivasjon. Motivasjonen til utøverne er i konstant utvikling som et resultat av personlige og kontekstuelle variasjoner.
Hva betyr det å være en multikunstner for deg?
1
2
3
4
5
6
7

Hva kan du gjøre for å utvikle deg videre etter kurset?

Kan du få noen til å filme deg på treninger?

Hvordan kan du fortsette å øke din kunnskap om sporten og dele erfaringer med andre kolleger?

kan dere opprette mentor/kollega grupper?

Lykke til videre, og takk for at du ville være med å utvikle kunnskapen om sammenhengen mellom treneres handlinger og utøveres motivasjon.

Hva kan **jeg** gjøre for å utvikle opplegget videre, fint om du kan gi meg din mening om kurset:

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