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Keywords

outdoor life, outdoor life students, motivation, self-determination theory, basic psychological needs

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Article

Self-determination theory as a possible explanation for the motivation of Norwegian outdoor life students

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1. Introduction

The number of courses on outdoor life at Norwegian universities and colleges has increased in recent years, and an increasing number of students have been applying to these courses. Therefore, it may be interesting to investigate students' motivation for engaging in outdoor activities; this may significantly contribute to the development of courses on outdoor life and increase students' well-being.

A few studies have been conducted on motivation for outdoor life, both in Norway and internationally—this will be discussed later in this article. Based on the self-determination theory (SDT) by Deci and Ryan [1], this article examined the form of motivation that induces outdoor life students at Norwegian universities and colleges to engage in outdoor life activities when they start their education [1–3]. The study also analyzed how students score basic psychological needs, such as autonomy, competence, and social belonging, which are central to the theory [3].

Furthermore, we investigated the extent to which basic psychological needs, together with intrinsic and different forms of extrinsic motivation, can help explain how often they engage in outdoor activities [3–8].

Additionally, the significance of the experience of nature and the activities for students when they engage in outdoor life activities was also studied. Finally, two analyses

were conducted to identify whether the SDT can indicate the extent of significance of experience of nature and the activities themselves for the students [9, 10].

A few studies have focused on peoples' motives for performing outdoor activities; however, none was based on the motivation theory and most were published before 2002. A 1994 survey by the Norwegian Institute for Nature Research (NINA) classified six motives: mastery and harvesting had the lowest scores, preceded by experience nature, exercise, and social, in that order. The experience of peace and quiet was the most-stated motive [11]. In a Swedish research project in 2008, the four most important motives for outdoor life were: physical exercise, relaxation, being close to nature, and spending time with family [12].

Results of the 2001 living conditions survey by Statistics Norway, where the significance of various conditions for outdoor exercise was examined, showed the following order: contemplation, physical activity, socializing, experiencing nature, and coping/excitement [13]. The concept of contemplation encompasses the following: gathering new strength and surplus, getting away from stress and hustle, changing from daily routine, and having time to think about life. In 2001, outdoor life students at the Telemark University College stated that the experience of nature was the most important motive, followed by health/physique, contemplation, and mastery [13].

Other studies have revealed such motives as challenges, risk, status, performance, personal development, and excitement [9, 10, 14]. These studies involved activities such as climbing and kayaking.

Two Asian studies, one each from Malaysia and Indonesia [15, 16], examined students' motivation for outdoor recreation/activity. The main motives revealed in these studies were to enjoy nature, seek new experiences, take on challenges, learn new skills, and the social community.

The theoretical background of this article is the SDT — a comprehensive social-cognitive theory with a focus on competence, autonomy, and relatedness [17]. Deci and Ryan [17] criticize most traditional motivation theories for focusing unilaterally on goals, results, and reasons for results, and overlooking autonomy (self-determination), which, in the SDT, is a significant factor for motivation.

The SDT specifies three primary psychological needs that motivate human behavior: autonomy, competence, and relatedness [18]; these needs can explain students' motivation to engage in outdoor activities. Competence refers to the need to succeed in optimally challenging tasks, to achieve a desired result, and to have a feeling of mastering the task. Autonomy relates to the need to make choices and initiate actions. Relatedness refers to the need to establish mutual respect, trust, and connection with others [2, 19, 20]. Ryan and Deci [21] claim that competence, relatedness, and autonomy are prerequisites for maintaining and promoting intrinsic motivation.

The SDT divides human motivation into three categories: intrinsic, extrinsic, and amotivation. Extrinsic motivation comprises four categories. The most autonomous form of external motivation is integrated regulation. It is followed by identified regulation and introjected regulation. The most controlled and least autonomous form is external regulation.

Intrinsic motivation, which is based on the human desire to be competent and self-determined, refers to activities performed "for their own sake." The activity itself is rewarding enough and provides satisfaction, desire, and joy [22, 23]; a classic example is children's exploration and play, which indicates their innate drive to engage with and explore their own capacity to overcome optimal challenges—adults mostly perform this via "modern" outdoor life activities. There is a close connection between perceived competence and intrinsic motivation: the more competent people perceive themselves to be in an activity, the more intrinsically motivated they will be. This connection presupposes that an activity must be optimally challenging. This is in line with the theory of flow [24, 25]. Perceived competence affects intrinsic motivation when one has the experience of influencing the results [1, 19]. Several outdoor activities, such as skiing, climbing, and

kayaking contain many of these elements. In relation to the previously mentioned studies regarding motives for practicing an outdoor life, contemplation, nature experience, and mastery/excitement will be defined as intrinsic motivation; physical activity can be both intrinsic and extrinsic [3, 13].

Integrated regulation is a form of external motivation that is mostly self-governing and is characterized by actions that have become part of the self. These are actions that we perform of our own free will and, largely, to satisfy our psychological needs. Identified regulation is the action we take to achieve inner rewards, such as learning new skills. However, these are not fully integrated into the self. To a greater extent, introjected regulation is controlled by others. We take these actions to avoid criticism and gain external recognition. An example here could be the trend of posting photos from trips and activities to achieve "likes" on social media. External regulation is the least autonomous and controlled form of external motivation. These actions are taken to achieve external reinforcement or to avoid punishment [7]. Amotivation is defined as a lack of interest and intention to act because the person sees no value in participating [3, 19].

Human motivation varies from pure intrinsic to pure extrinsic motivation. The SDT assumes that humans have an innate tendency to actively expose themselves to challenges, develop skills, and explore new activities, even in the absence of external demands or rewards. This innate tendency is the basic prerequisite for intrinsic motivation [3, 21, 26, 27].

The SDT perceives people as active, growth-oriented organisms with an innate ability to seek challenges and engage with the surrounding environment. Perseverance in relation to activity is most likely when a person possesses both a high degree of intrinsic motivation and well-integrated and identified extrinsic motives [4, 6, 21, 28, 29].

A few researchers argue that extrinsic motivation cannot be described as autonomous and that extrinsic motivation is, thus, the opposite of self-determination [30]. Conversely, the SDT believes that it is possible to be self-determined and externally motivated [2, 19]. This theory is based on the belief that humans have an inherent desire to acquire and internalize social regulations; however, this inherent tendency depends on support from the surrounding environment [19, 31]. Children's engagement with outdoor life is, in many ways, a good example of this. Children are often taken on trips against their will, but during the trip, they experience a high degree of mastery, self-determination, and relatedness. This leads to motivation from extrinsic regulation to more autonomous forms of extrinsic motivation, and often to intrinsic motivation.

Based on the SDT [17, 19] and previous research on motivation for outdoor life activities [9, 10, 13–16], the following hypotheses were developed:

H 1: Outdoor-life students with a high score on all the three basic psychological needs, intrinsic motivation, and the most autonomous extrinsic motives (integrated and identified regulation) most often engage in outdoor life activities [3–8].

H 2: Intrinsic motivation and a high degree of the most autonomous forms of extrinsic motivation, in addition to a high score on basic need autonomy and relatedness, explain the extent of significance of experience of nature for students [15, 16].

H 3: Intrinsic motivation and a high degree of the most autonomous forms of extrinsic motivation, in addition to a high score on basic need competence, explain the extent to which the activity itself is important for students [15, 16].

2. Materials and Methods

2.1. Participants

The participants were 91 first-year students in outdoor life at four selected universities/colleges in Norway, which resulted in response rates of 73 %. Data were collected in the autumn of 2020, immediately after the start of the course. Questionnaires were created using Google Forms, and students received access links upon commencing their course. Students were aged 18–59 years, with the majority being under 26 years (82%). There were 42 male

and 49 female participants. The project was registered and approved by the NSD Norwegian Centre for Research Data. We obtained informed consent from the participants.

2.2. Questionnaire

The survey comprised two questionnaires. The Norwegian version of the Sports Motivation Scale II (SMS-II) - (a revised version of the SMS [32] — comprising 18 questions was used to measure motivation. There were six factors representing intrinsic motivation: integrated, identified, introjected, and external regulations, and amotivation. Most factors, with the exception of introjected (0.52 poor) and external regulation (0.65 debatable), had satisfactory reliability values with Cronbach's α values greater than or equal to 0.70 (Table 1) [33]. The confirmatory factor analysis also produced an acceptable result [36]. The obtained indices (GFI = 0.88, AGFI = 0.85, RMSEA = 0.06, CFI = 0.92) suggested an appropriate fit for the model with the data. Each factor comprised three questions, and answers were marked on a 7-point equal scale (1 = not correct at all to 7 = completely correct).

The Basic Psychological Needs in Exercise Scale (BPNES) was used to measure basic psychological needs [29, 34]. The questionnaire was translated into Norwegian and back-translated into English; it was tested on a group of students for validation purposes. It comprised 12 questions measuring three factors: self-determination, competence, and relatedness. Each factor had four questions and answers were marked on a 7-point equal scale (1 = not correct at all to 7 = completely correct). All factors had reliability values higher than 0.70 (Table 1) [33]. The questions in both forms were tailored to outdoor-life students. Additionally, indices obtained from the confirmatory factor analysis (GFI = 0.94, AGFI = 0.91, RMSEA = 0.08, CFI = 0.94) indicated an appropriate fit of the model with the data.

For the question, "how often do you engage in outdoor activities in a year?", the answer options were: several times a week, once a week, two to three times a month, once a month, and less frequently than once a month. The following two questions were answered using a 7-point scale: "How important is the nature experience?"; and "How important is the activity itself for you when you engage in outdoor life activities?" (1 = not important at all; 7 = very important).

Table 1. Correlation between the variables. Number of participants, mean value, standard deviation and alpha values for all variables

	1.	2.	3.	4.	5.	6.	7.	8.	9.
Intrinsic motivation									
Integrated regulation	.637**								
Identified regulation	.531**	.751**							
Introjected regulation	.418**	.522**	.517**						
Extrinsic regulation	.360**	.297**	.479**	.523**					
Amotivation	-.163	-.266*	-.140	-.030	.080				
Autonomy	.528**	.714**	.460**	.335**	.144	-.343**			
Competence	.430**	.545**	.470**	.205	.230*	-.349**	.768**		
Relatedness	.460**	.502**	.339**	.137	.186	-.313**	.758**	.773**	
N	91	90	90	90	91	90	88	88	89
M	6.12	5.56	5.69	4.92	3.35	1.47	5.85	5.48	5.67
St. Deviation	1.03	1.34	1.20	1.10	1.34	.80	1.00	1.02	.092
Cronbach's Alpha	.73	.83	.86	.52	.65	.72	.86	.82	.75

* $p < .05$; ** $p < .01$

2.3. Statistical Analysis

IBM SPSS Statistics version 26 was used for the analysis. Descriptive statistics, means, and standard deviations are listed for all variables. A simple correlation was calculated to test the relationships between all the variables. The paired samples t-test [35] was used to determine whether there was a statistically significant difference between the answers to how important the nature experience and the activity itself was for the participants when they engaged in outdoor life activities. It was also used to examine whether the differences between motivational factors were statistically significant. Three regression analyses were conducted, in which all six motivational factors and the three factors that measured basic psychological needs were independent variables. The dependent variables were as follows: 1. How often do you engage in outdoor activity?; 2. How important is an activity itself? and 3. How important is nature experience? It was tested for autocorrelation in the dataset using Durbin–Watson statistics. Collinearity was tested using the variance inflation factor (VIF) [36]. Both tests demonstrated that this was not a problem in the dataset.

3. Results

The mean value of the internal motivation factor was 6.12 (Table 1). For the most autonomous variants of external motivation, the mean score of the participants was 5.56 for integrated regulation and 5.69 for identified regulation. Introjected regulation had a score of 4.92 whereas external regulation had a mean of 3.35. There was a statistically significant difference between the factors, with the exception of integrated and identified regulations.

The average values of the three basic psychological needs were 5.85 for self-determination, 5.48 for competence, and 5.67 for social belonging. There was no significant difference between self-determination and social belonging.

Regarding the questions about how important the nature experience and the activity itself are for them when they engage in outdoor life activities, the scores were 6.25 and 5.31, respectively. A total of 65% of the respondents engaged in outdoor activities once or more than once per week (Table 2). The difference was statistically significant at the level of 0.01.

Table 2. Frequency of outdoor life students' engagement in outdoor activities

	Frequency	Percentage	Cumulative percentage
More than once a week	33	36.3	36.3
Once a week	27	29.7	65.9
Two to three times a month	24	26.4	92.3
Once a month	3	3.3	95.6
Less than once a month	4	4.4	100.0
Total	91	100.0	

Regression analysis was conducted with how often one engaged in outdoor life activities as the dependent variable. This is explained only by the independent variable, competence (sig = 0.01). Those who scored high on competence were most active in outdoor activities, with R^2 at 0.07.

Table 3. Regression analysis concerning how often students engage in outdoor activities, how important the nature experience is and how important the activity itself is as the dependent variables and intrinsic motivation, integrated regulation, identified regulation, introjected regulation, external regulation, amotivation, autonomy, competence, relatedness as the independent variables

Dependent variable			
Independent variable	How often you do engage in outdoor activities?	How important is the nature experience?	How important is the activity itself?
Intrinsic motivation (β)	-.14	-.17	.050**
Integrated regulation (β)	-.16	.27	-.04
Identified regulation (β)	.32	.05	-.13
Introjected regulation (β)	-.05	.03	-.38*
External regulation (β)	.05	.05	-.08
Amotivation (β)	.01	-.31*	.13
Autonomy (β)	.32	.44*	.02
Competence (β)	-.61	-.50**	.01
Relatedness	-.05	.01	.11
R ²	.07	.30	.10
F	1.76	5.10**	5.65**

* $p < .05$; ** $p < .01$

In the regression analysis, where the importance of the nature experience was the dependent variable, four factors provided a significant explanation for this, with an R^2 of 0.38: integrated regulation (sig = 0.01), motivation (sig = 0.05), competence (sig = 0.01), and self-determination (sig = 0.05). Those who scored high on integrated regulation and self-determination, as well as those who scored low on motivation and competence, generally stated that nature experience was important.

The regression analysis, where the activity itself was the dependent variable, showed that those who scored high on intrinsic motivation (sig = .01) and low on introjected regulation (sig = .05) explained 10% of the variable.

4. Discussion

This study investigated the type of motivation that induces first-year students of the outdoor life course at Norwegian universities and colleges to engage in outdoor life activities when they begin their course. The theoretical starting point is Deci and Ryan's [1] SDT.

Additionally, we examined how students score on basic psychological needs, such as autonomy, competence, and relatedness, which are central to the SDT [3, 19], and whether these psychological needs, together with intrinsic and different forms of extrinsic motivation, can be included to explain how often students engage in outdoor activities [3, 4, 6–8, 37].

Furthermore, the significance of nature experience and the activity itself for students when they engage in outdoor life activities was explored [13]. We investigated whether the SDT can indicate the extent of significance of experience of nature and the activity itself for the students [9, 10].

Students who enroll in the outdoor life program are largely influenced by intrinsic motivation and the two most autonomous forms of extrinsic motivation. The score on introjected regulation, which is a more controlled form of external motivation, was relatively high (4.92). When one is introjected regulated, it implies that the person performs the activity to avoid negative feedback or achieve a special form of recognition [38]. It is uncertain how much significance should be assigned to this, as the alpha value for the index is poor (0.52) [33]. However, it may be an indication that the social media trend to document where one has been on a trip to get "likes" is part of students' motivation.

Outdoor-life students' scores were high for all the three basic psychological needs: autonomy, competence, and relatedness. Autonomy was the most important need, and, somewhat surprisingly, competence had the lowest score [3, 7, 19].

Both nature experience and the activity itself were important for outdoor life students, with nature experience being significantly more important. This finding is in line

with previous research on motives for engaging in outdoor activities [11–13, 15, 16]. This confirms Odden's conclusion in his doctoral dissertation on the developmental trends in Norwegian outdoor life from 1970 to 2004:

Established motives for outdoor activities are still strong in the population. Well-established motives related to contemplation, nature experience, physical activity, and social gatherings are central to Norwegians' outdoor-life activities. Motives related to excitement, mastery, challenges, and harvesting are less prevalent. There is a tendency for the most important motives from the traditional outdoor life to be transferred to the new activities, but it also seems as if motives related to excitement, mastery, and challenge have a stronger position with the new activities [39: 321].

It should be mentioned that, for example, the Norwegian Climbing Association has increased the number of members from 9,000 in 2004 to 26,000 in 2020 [40]. Thus, it is conceivable that motives related to excitement and mastery have also increased since 2004. Future studies should include more questions regarding these two variables, thus increasing both reliability and concept validity [41].

A regression analysis was conducted where the frequency of outdoor life activities was the dependent variable. Only 10% of the variables were explained in the analysis, and the only factor that explained this was the basic need for competence. In other words, the more important competence is as a basic psychological need for students, the more often they engage in outdoor activities. This was unexpected, as we had assumed that the variable would be explained by a high score on intrinsic motivation, the most autonomous form of extrinsic motivation, and all three basic needs [5, 7, 42]. However, our first hypothesis was not confirmed. Further research is required to reveal more explanatory variables for the frequency of activity. Numerous variables, such as accessibility to nature areas and equipment, and knowledge/affiliation to a group/association/club could affect the frequency of activities.

The results showed that the emphasis students place on the nature experience itself can be explained by four factors; this explained 38% of the dependent variable. As expected, students who placed significant emphasis on nature experience scored high on self-determination as a basic psychological need and on integrated regulation, which is the most autonomous form of extrinsic motivation. Additionally, they had low amotivation scores. What is more interesting is the negative connection with competence. This implies that those with a low competence score place greater emphasis on nature experience and are most likely not very interested in mastering their activities. We expected that intrinsic motivation and identified regulation would have an impact on the dependent variable, nature experience [7, 21]. Thus, the second hypothesis was not supported. Future inquiries should also include questions about nature experiences; it will increase the reliability and conceptual validity of this factor [41].

The explanation for the significance of the activity itself was a high score on intrinsic motivation and a low score on introjected regulation, where intrinsic motivation explained 9% of the variable. These two factors together explained only 10% of the variable, which implies that there are many other factors not captured here, which could have explained this dependent variable better. The assumption here is that several factors explain this variable. Here, the expectation was that those who stated that the activity was important would have a high score on the most autonomous forms of extrinsic motivation and competence as a basic psychological need [5, 19, 43]. However, our final hypothesis was not confirmed. The determination of the reason for this low explanation percentage is difficult. Many other factors can explain the significance of an activity itself. Important elements that were not included in this survey were, for example, knowledge and familiarity with the activity. More questions should be included to explain this variable better.

5. Conclusions

Through this study, we confirmed some of the assumptions regarding the connection between outdoor life exercise and motivation among outdoor life students at Norwegian universities and colleges. Students showed a high degree of intrinsic motivation and a high score on all three basic psychological needs. The need for autonomy had the highest score. For outdoor-life students, both the nature experience and the activity itself were important, but the former was more important.

The basic psychological need for competence mainly explained the extent of engagement of students in outdoor life activities; for the most active students, competence was an important basic psychological need. It is surprising that this is the only independent variable that has an explanatory effect on the dependent variable. It was expected that the variable would be explained by a high score on internal motivation, the most autonomous forms of external motivation, and all the three basic needs. However, the first hypothesis was not confirmed.

The experience of nature being the most important was mainly explained by a high score on self-determination as a psychological need, in addition to a high score on the most autonomous external motivation: integrated regulation. Interestingly, this was explained by a low score for the need for competence. High scores for intrinsic motivation and identified regulation were also expected; however, this hypothesis was not confirmed.

The significance of the activity itself was explained by a high score on internal motivation and low score on introjected regulation, and it was expected that the dependent variable would also be explained by a high score on the most autonomous forms of external motivation and competence as basic psychological needs. Thus, the third hypothesis was not supported. The low explanatory effect on several of the dependent variables serves as a strong argument for more research to determine the factors that can explain these to a greater extent.

Based on this study, practical recommendations for outdoor education teachers are as follows: To maintain high scores on intrinsic motives and the most autonomous extrinsic motives, education should be based on self-determinate activities for students. This will also satisfy students' basic psychological needs for autonomy, competence, and relatedness. It is also important to maintain their emphasis on the experience of nature. To increase students' interest in outdoor activities, it is necessary to improve their skills in selected activities such as kayaking, climbing, canoeing, and skiing.

This study has a few limitations. The sample included only 91 students; more universities could have been asked to participate in the study. This would have strengthened the statistical analysis of the data. As mentioned earlier, to increase reliability and conceptual validity, future studies should include more questions about nature experiences, and knowledge and familiarity with outdoor activities. The questionnaires were translated into Norwegian and validated with the help of students, which could have influenced their understanding of the questions. This may explain the low alpha values of some of the variables. Finally, we could have used more advanced statistical methods, such as structural equation modeling, for the analysis.

References

1. Deci EL, Ryan RM. *Intrinsic motivation and self-determination in human nature*. New York: Plenum Press; 1985.
2. Deci EL, Ryan RM, Eds. *Handbook of self-determination research*. New York: The University of Rochester Press; 2002.
3. Ryan RM, Deci EL. *Self-determination theory, basic psychological needs in motivation, development, and wellness*. New York: The Guilford Press; 2017.

4. Duncan LR, Hall GR, Wilson PM, Jenny O. Exercise motivation: A cross-sectional analysis examining at relationships with frequency, intensity, and duration of exercise. *Int J Behav Nutr Phys Act.* 2010;7:1–7. DOI: 10.1186/1479-5868-7-7
5. Gillet N, Rosnet E. Basic need satisfaction and motivation in sport. *Athletic Insight. The Online Journal of Sport Psychology.* 2008;1(10):1–13.
6. Smith AL, Ntoumanis N, Duda JL, Vansteenkiste M. Goal striving, coping, and well-being: A prospective investigation of the self-concordance model in sport. *J Sport Exerc Psychol.* 2011;33(1):124–145. DOI: 10.1123/jsep.33.1.124
7. Standage M, Curran T, Rouse PC. Self-determination-based theories of sport, exercise and physical activity motivation. In Horn T, Smith AL, Eds. *Advances in sport and exercise psychology.* Champaign, IL: Human Kinetics, 2019, 289–311.
8. Vlachopoulos SP, Katartzi ES, Kontou MG. The basic psychological needs in physical education scale. *J Teach Phys Educ.* 2011;30(3):263–280. DOI: 10.1123/jtpe.30.3.263
9. Ewert WA, Gilbertson K, Luo Y, Voight, A. Beyond "because it's there": Motivations for pursuing adventure recreational activities. *J Leisure Res.* 2013;45:91–11. DOI: 10.18666/jlr-2013-v45-i1-2944
10. Kerr JH, Mackenzie H. Multiple motives for participating in adventure sports. *Psychol Sport Exerc.* 2012;13:649–657. DOI: 10.1016/j.psychsport.2009.02.002
11. Aasetre J, Kleiven J, Kaltemnborn BP. Friluftsliv i Norge – Motivasjon og atferd. In Oppdragsmelding 309. Norsk Institutt for Naturforskning NINA; 1994, 1–56. Norwegian.
12. Fredman P, Karlson SE, Romild U, Sandell K. Vara i naturen-varför eller varför inte? Delresultat från en nationell enkät om friluftsliv och naturturism i Sverige. In *Forskningsprogrammet Friluftsliv i förändring.* Östersund, Mittuniversitetet; 2008. Swedish.
13. Odden A, Aas OE. Motiver for friluftslivsutøvelse: teori, metoder og resultater fra norske undersøkelser 1974–2001. In *Forskning i friluft. Øyer FRIFO;* 2002. Norwegian.
14. Saxena K, Dey AK. Treks' rapids: Identifying motivational factors for adventure sports. *Am J Econ Business Adm.* 2010;2(2):172–178. DOI: 10.3844/ajebasp.2010.172.178
15. Gaffer V, Yuniawati Y, Ridwanudin O. A study of outdoor recreation motivation and activity preferences. *Journal of Southwest Jiaotong University,* 2019;54(3):1–10. DOI: 10.35741/issn.0258-2724.54.3.23
16. Sidi MAM, Radzi WM. A study of motivation in outdoor recreational activities. *Int J Academic Res Business Soc Sci.* 2017;7(3):366–379.
17. Deci EL, Ryan RM. The "what" and "why" of goal pursuits: Human needs and self-determination of behavior. *Psychol Inq.* 2000;11(4):227–268. DOI: 10.1207/S15327965PLI1104_01
18. Bhavsar N, Barytholowmew J, Quested E, Gucciardi DF, Thøgersen-Ntoumani C, Reeve J, et al. Measuring psychological need states in sport: Theoretical considerations and a new measure. *Psychol Sport Exerc.* 2020;47. DOI: 10.1016/j.psychsport.2019.101617
19. Ryan RM, Deci EL. Brick by brick: The origins, development, and future of self-determination theory. In Elliot A, editor. *Advances in motivation science.* Cambridge, MA: Academic Press; 2019, 111–156.
20. Rodrigues F. The co-occurrence of satisfaction and frustration of basic psychological needs and its relationship with exercisers' motivation. *J Psychol.* 2021;155(2):165–185. DOI: 10.1080/00223980.2020.1862738
21. Ryan RM, Deci EL. Active human nature. In Hagger MS, Chatzisarantis LD, Eds. *Intrinsic Motivation and self-determination in exercise and sport.* Champaign, IL: Human Kinetics; 2007.
22. Hagger MS, Chatzisarantis NLD. Advances in self-determination theory research in sport and exercise. *Psychol Sport Exerc.* 2007;8(5):597–599. doi:10.1016/j.psychsport.2007.06.003
23. Hancox J, Quested E, Ntoumanis N, Thøgersen-Ntoumanis C. Putting self-determination theory into practice: Application of adaptive motivational principles in the exercise domain. *Qualit Res Sport Exerc Health.* 2018;10(1):75–91. DOI: 10.1080/2159676X.2017.1354059
24. Csikszentmihaly M. *Flow, the psychology of optimal experience.* New York: Harper Perennial; 1990.
25. Csikszentmihaly M. *Flow and the foundations of positive psychology.* New York: Springer; 2016.
26. Standage M, Gillison FB, Emm L. Self-determination theory. In Eklund RC, Tennenbaum G, Eds. *Encyclopedia of sport and exercise psychology.* London: SAGE; 2014, 629–632.
27. Vallerand R. Intrinsic and extrinsic motivation in sport and physical activity: A review and a look in the future. In Tennenbaum G, Eklund RE, Eds. *Handbook of sport psychology.* New York: John Wiley; 2007, 255–279.

28. Ryan RM, Deci EL. An overview of self-determination theory: An organismic-dialectical perspective. In Deci EL, Ryan RM, Eds. *Handbook of self-determination research*. New York: University of Rochester Press; 2002.
29. Vlachopoulos SP, Ntoumanis N, Smith AL. The basic psychological needs in exercise scale: Translation and evidence for cross-cultural validity. *Int J Sport Exerc Psychol*. 2010;4(8):394–412. DOI: 10.1080/1612197X.2010.967160
30. DeCharms MA. *Personal causation: The internal affective determinants of behavior*. New York: New York Academic Press; 1968.
31. Chandler CL, Connel JP. Children's intrinsic, extrinsic and internalized motivation: A developmental study of children's reasons for liked and disliked behaviors. *Br J Develop Psychol*. 1987;5(4): 357–365. DOI: 10.1111/j.2044-835X.1987.tb01072.x
32. Pelletier LG, Fortier M, Vallerand R, Tuson K, Brière N, Blais M. Toward a new measure of intrinsic motivation, extrinsic motivation, and amotivation in sports: The Sport Motivation Scale (SMS). *J Sport Exerc Psychol*. 1995;17(1):35–53. DOI: 10.1123/jsep.17.1.35
33. Lavrakas P, editor. *Encyclopedia of survey research methods*. 1 ed. SAGE; 2008.
34. Vlachopoulos SP, Michailidou S. Development and initial validation of a measure of autonomy, competence, and relatedness in exercise: The basic psychological needs in exercise scale. *Meas Phys Educ Exerc Sci*. 2006;10(3):179–201. DOI: 10.1207/s15327841mpee1003_4
35. de Winter JFC, Dodou D. Five-Point Likert Items: t test versus Mann-Whitney-Wilcoxon. *Pract Assess Res Evaluation*. 2010;15: 1–17. DOI: 10.7275/bj1p-ts64
36. Hair J, Anderson R, Babin B, Black W. *Multivariate data analysis*. 8th ed. New Jersey: Cengage Learning EMEA; 2018.
37. Gillet N, Vallerand RJ, Amouira S, Baldes B. Influence of coaches' autonomy support on athletes' motivation and sport performance: A test of the hierarchical model of intrinsic and extrinsic motivation. *Psychol Sport Exerc*. 2010;11(2):155–161. DOI: 10.1016/j.psychsport.2009.10.004
38. Markland D, Ingledew DK. Exercise participation motives. In Hagger MS, Chatzisarantis NLD, Eds. *Intrinsic motivation and self-determination in exercise sport*. Champaign, IL: Human Kinetics; 2007.
39. Odden A. Hva skjer med norsk friluftsliv?: En studie av utviklingstrekk i norsk friluftsliv 1970–2004. In Faculty of social science and technology management. Trondheim: Norwegian University of Science and Technology; 2008, 289. Norwegian.
40. NFK. Norwegian Climbing association. Membership clubs. 2022. [cited 2022 12.01.2022]. Available from: <https://klatring.no/medlemstall-klubber>. Norwegian.
41. Dalland O. *Metode og oppgaveskriving*, 7. ed. Oslo: Gyldendahl; 2020. Norwegian.
42. Standage M, Duda JL, Ntoumanis N. A test of self-determination theory in school physical education. *Br J Education Psychol*. 2005;75:411–433. DOI: 10.1348/000709904x22359
43. Ratelle CF, Guay F, Vallerand R, Larose S, Senecal C. Autonomous controlled, and amotivated types of academic motivation: A person-oriented analysis. *J Education Psychol*. 2007;99(4):734–746. DOI: 10.1037/0022-0663.99.4.734

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