

# Students' personal desire for excitement and teachers' autonomy support in outdoor activity: Links to passion, intrinsic motivation, and effort

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## Abstract

The purpose of the study was to test the role of the personal desire for excitement and its links to autonomy support, harmonious and obsessive passion, and longitudinal intrinsic motivation, and effort in students' favorite outdoor activity. 675 students at Norwegian folk high schools [*folkehøgskole*] attending a one-year study of their favorite outdoor activity (for instance, hunting, fishing, mountain climbing, kiting, and sailing) completed a questionnaire package. The desire for excitement positively predicted perceived autonomy support and the two types of passion. Autonomy support positively predicted harmonious passion, which in turn was positively linked to change in intrinsic motivation, which again positively predicted change in effort. Length of experience moderated the link between desire for excitement and obsessive passion. Furthermore, participants with short experience in the activity, relative to those with long experience and males, reported a higher desire for excitement and a higher obsessive passion. Autonomy support from teachers is important for young adults pursuing activities giving experiences of excitement, speed, and risk. Teachers can be autonomy supportive by acknowledging students' feelings and perspectives, encouraging self-initiation and exploration of new experiences, avoiding communicating pressuring expectations, and instead offering choice among different types of exercises and training methods that may help the participants to attain their personal goals. In such a social context, it is important that teachers encourage them to further explore and to improve their skills, as they understand their excitement-seeking personality. Autonomy support might help the students choose activities providing excitement arousal in a good way, instead of high-risk activities with negative consequences.

**Keywords:** *Norwegian folk high schools; friluftsliv; desire for excitement; motivation*

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## Introduction

This study looked at motivation and effort among young adults engaged in outdoor activities as, for instance, hunting, fishing, kiting, sailing, surfing, off-road bicycling, off-piste skiing, dog mushing, snowboarding, and mountain climbing. These outdoor activities are understood as Norwegian *friluftsliv*, or *friluftsliv* activities, a part of Norwegian culture and identity (Hofmann et al., 2018). *Friluftsliv* may be exercised through a wide range of different activities, as listed above. The young adults' motives for participating in *friluftsliv* activities may vary, but in this study we try to explain their excitement-seeking behavior. The desire for sensation seeking behavior is understood as engaging in situations involving excitement, speed and risk (Zuckerman et al., 1978). The individuals who participated attended a one-year study of their favorite outdoor activity at Norwegian folk high schools. These schools are a Nordic school type without a final examination, where the individual's social growth and practical experience are important (Folkehøgskolene, 2021; Waaler et al., 2012). This research was grounded in three theoretical models. First, the desire for excitement could explain excitement-seeking behavior (Meyer et al., 1999). Second, self-determination theory (Deci & Ryan, 2000) posits that experiences of positive, affective, and behavioral outcomes are partly explained by autonomy support. Third, the dualistic model of passion asserts that harmonious and obsessive passion toward a person's chosen activity can help us to understand the psychological processes leading to affective outcomes and activity engagement (Vallerand et al., 2003). The research question is how the desire for excitement, autonomy support, and passion may explain longitudinal intrinsic motivation and effort related to the young adults' participation in their favorite outdoor activity. In addition the role of length of experience and gender will be explored due to research presented later in the article.

### Personal desire for excitement

A desire to engage in physical activities involving excitement, speed, and risk is typically defined as thrill and adventure seeking, a sub-factor under the more global sensation seeking construct (Zuckerman et al., 1978), which itself is defined as “the need for varied, novel, and complex sensations and experiences and the willingness to take physical and social risks for the sake of such experiences” (Zuckerman, 1979, p. 10). In the present study, students chose a one-year study of their favorite outdoor activity (e.g., downhill skiing, and mountain climbing) under professional supervision. Research indicates that intense pursuit of such activities involving pleasure and excitement are positively correlated with components of the passion construct, that is, perceived importance, enjoyment, and identification with the activity. This might result in positive outcomes such as high achievement, mastery, and resource acquisition (Meyer et al., 2007). Conversely, the same pleasure pursuit can also be harmful and result in exercise addiction, with the tendency to feel uncomfortable when not engaging in the activity (Meyer et al., 2007).

Due to its significance for perceived importance of, enjoyment in, and identification with the activity, the desire for excitement defined as a personality construct may not only play a role in the development of passion for the chosen activity. It may also indirectly influence motivation for and effort pursued in the activity. The inherent eagerness to actively develop new skills, challenge themselves and take interest in new activities even in the absence of external rewards, is seen as intrinsic motivation (Ryan & Deci, 2007). Effort in outdoor activity means that the student works hard and spends a lot of energy in the activity solving challenges to the best of his/her ability (McAuley et al., 1989). Participants with a personal desire for excitement may have satisfying experiences by pursuing for instance downhill skiing, because such activities are effective in increasing the excitement and arousal level among individuals (Roberti, 2004). Thus, intrinsic motivation and rewards have been linked to involvement in such activities (Trimpop, 1994). The positive association between involvement in such activities and intrinsic self-regulation is supposed to be associated with intrinsic rewards, such as hormonal pleasures (Zuckerman, 1984), varied reinforcing sensations, and experiences from the activity itself (Diehm & Armatas, 2004). For instance, hormones such as corticosteroids may have euphoric and reinforcing properties, and they may influence the dopamine pathways of the brain (Roberti, 2004). According to Meyer et al. (1999), an individual's desire for excitement is theoretically supposed to explain the link between a heightened sensitivity and responsiveness of the nervous system and excitement-seeking behavior, because their nervous system responses affect the behavioral activation system leading to more biologically related intrinsic rewards (see also Roberti, 2004).

In the present study, we will look at how the participants' desire for excitement would relate to autonomy-supportive contexts, passion, motivation, and effort. Based on the personality literature, sensation seekers prefer to engage in activities together with a significant amount of other persons congruent with their preference for varied, novel, and complex interactions (Zuckerman, 1991, 1994). As they regulate their behavior according to cues in the environment that are intrinsic to an activity (Diehm & Armatas, 2004; Meyer et al., 1999), receiving autonomy support from others with similar interests is important to them. This is because autonomy support has consistently been shown to satisfy needs, resulting in identified and intrinsic self-regulations (Deci & Ryan, 2000). Hence, the desire for excitement would relate positively to perceived autonomy support. In addition, excitement seeking would relate directly in a positive manner to passion, as indicated by Meyer et al. (2007). Because excitement seekers are hypothesized to be positively oriented toward socializing sources giving them autonomy support, research indicated that a harmonious passion toward the activity might follow (Bonneville-Roussy et al., 2013).

### **Autonomy support**

Social contexts are defined as autonomy supportive if the persons' needs for autonomy, competence, and relatedness are satisfied. Significant others can provide

autonomy support by offering choice, explaining why activities may be important and meaningful, minimizing pressure, providing an understanding attitude, and acknowledging the feelings and perspectives of the person (Williams et al., 1996). Self-determination theory (Deci & Ryan, 2000) and research indicates that autonomy support from friends, teachers, coaches, and health professionals is important, because it facilitates internalization of self-determined forms of motivation and perceived competence, and thus results in optimal functioning (Hagger & Chatzisarantis, 2009; Hagger et al., 2005; Münster Halvari et al., 2012; Waaler et al., 2012).

Regarding affective and behavioral outcomes, autonomy support positively predicts well-being (Halvari et al., 2013; Waaler et al., 2012), as well as learning, performance, persistence, and effort. Autonomous types of motivation have been shown to mediate these relations (Black & Deci, 2000; Hagger & Chatzisarantis, 2007; Halvari et al., 2009; Vansteenkiste et al., 2004).

Besides its positive link to effort, autonomy support has also been related to passion and intrinsic motivation, which both are of particular relevance in the present study. Theory and research have indicated that perceived autonomy support from teachers and coaches would be positively linked to intrinsic motivation for physical activity among students and athletes (Deci & Ryan, 2000; Hagger & Chatzisarantis, 2009; Waaler et al., 2012). Also, previous research has shown autonomy support to positively predict harmonious passion among athletes, musicians, and students (Mageau et al., 2009). Perceived autonomy support from teachers positively predicted persistence among music students and, in a second study, harmonious passion mediated this link. In the same study, autonomy support did not predict obsessive passion, which did not predict persistence (Bonneville-Roussy et al., 2013). In sum, based on the literature reviewed, autonomy support is expected to positively predict harmonious passion, but not obsessive passion.

### Harmonious and obsessive passion

Passion is defined as a strong inclination toward an activity that people like, find important, and in which they invest time and energy (Vallerand, 2007, p. 1). When students choose one year of their life to pursue their favorite physical activity or sport, the activity is supposed to be important and self-defining for them and internalized into their identity. In autonomy-supportive social contexts the activity pursued is supposed to be autonomously internalized as an integrated part of one's identity and thus facilitate the development of harmonious passion. A person having a harmonious passion for an activity feels free to be involved in it because of the enjoyment from the activity itself. Hence, activity engagement becomes more flexible and in harmony with other tasks the person has to do. The activity is self-regulated, that is, controlled by the person. Attention and energy can be directed toward alternative tasks or adapted to situational demands. Harmonious passionate engagement is therefore posited to result in adaptive outcomes, such as intrinsic motivation, task

concentration, and effort (Bonneville-Roussy et al., 2013; Vallerand, 2007; Vallerand et al., 2003).

Conversely, obsessive passionate persons feel internally and/or externally pressured to engage in the activity they love and value. They may engage in the activity in order to feel accepted or worthy in the social context, or they cannot resist the temptation of experiencing the excitement linked to the activity. Thus, obsessive passion toward an activity may result in uncontrollable engagement and less adaptive outcomes, such as rigid persistence, activity dependency, conflict, frustration, and rumination about the activity when prevented from engaging in it (Bonneville-Roussy, et al., 2013; Vallerand, 2007).

Harmonious passion has been shown to be positively associated with consequences, such as positive types of motivation during task involvement (e.g., mastery goals), task focus, deliberate practice, and to be indirectly linked to performance through mastery goals (Vallerand, 2010; Vallerand et al., 2003, 2007). Harmonious passion has also been found to positively predict educational persistence and mediated the positive paths between autonomy support and persistence (Bonneville-Roussy et al., 2013). Thus, based on the above literature review, harmonious passion was expected to positively predict intrinsic motivation, which would positively predict effort. Effort was chosen as the dependent variable, because it theoretically is defined as a motivational outcome (Deci & Ryan, 2000), and because previous research indicates that intrinsic motivation and effort is significantly positively associated among participants in sports (Waalder et al., 2012).

In turn, the literature indicates that obsessive passion has been linked to less positive outcomes, such as lower levels of self-determined motivation, indirectly related to disengagement-oriented coping and lower levels of goal attainment, positively linked to rigid persistence in ill-advised activities, and indirectly negatively associated with performance through performance-avoidance goals (Dietrich, 2012; Séguin-Levesque et al., 2003; Vallerand, 2008, 2010; Vallerand et al., 2003, 2008). Obsessive passion did not predict educational persistence (Bonneville-Roussy et al., 2013) or flow during internet gaming (Wang et al., 2011).

The purpose of the study was to examine the role of the personal desire for excitement and its links to autonomy support, harmonious and obsessive passion, and longitudinal intrinsic motivation, and effort in students' favorite outdoor activity. Because persons high in the desire for excitement orient their behavior toward cues and important other persons in the environment congruent with their intrinsic motivation and activity preference (Diehm & Armatas, 2004; Zuckerman, 1991; 1994), the desire for excitement was hypothesized to positively predict perceived autonomy support and harmonious passion. Further, autonomy support was hypothesized to positively predict harmonious passion (Bonneville-Roussy et al., 2013), which in turn would be positively linked to intrinsic motivation (Dietrich, 2012), which would positively predict effort (Waalder et al., 2012). Harmonious passion is also predicted to mediate the links between autonomy support and intrinsic motivation and effort,

respectively, because autonomy support has previously been shown to be significantly positively associated with these outcome variables (Waaler et al., 2012). The research further indicated that the links between obsessive passion and other study variables, such as autonomy support, intrinsic motivation, and effort, have been shown to be non-significant or inconsistent. However, we modeled an explorative link between the personality construct of the desire for excitement as a potential antecedent of obsessive passion, because Meyer et al. (2007) indicated that excitement seeking may result in harmful consequences related to addiction. Also, excitement seeking as a facet of extraversion have been shown to be positively related to both harmonious and obsessive passion, in a model linking the Big Five personality traits to passion (Dalpe et al., 2019).

Regarding possible stages of the development of passion for an activity, Vallerand (2008) speculated that this may not be the case, because length of activity experience has not been significantly correlated with the two types of passion (Mageau et al., 2009; Vallerand et al., 2003). Some nuances are presented by Bonneville-Roussy and Vallerand (2017), where they present the role of passion in the development of expertise. The person in the investment stage is both high in harmonious and obsessive passion, but in the specialization stage the preference for an activity is associated with harmonious passion. This may be linked to the students in this study with a desire for excitement, but also differences in length of experience. To the extent that the desire for excitement predicts passion, there might be a possibility that length of experience in an activity moderates this link, because the younger participants are, or the shorter their experience is, the higher their desire for excitement (Roberti, 2004; Meyer et al., 2007; Zuckerman et al., 1978) and the higher their addictive tendencies (Meyer et al., 2007). In the present study, we explored the role of length of experience as a moderator in the desire for excitement-passion link. For instance, does the desire for excitement predict obsessive passion more strongly among students with little experience, than among those more experienced?

A control variable in the present study is gender. Previous research has shown relatively consistently that scores on the desire for excitement are significantly higher among men than women in the US, Australia, Canada, and Spain (Zuckerman, 1994; Zuckerman et al., 1991). Regarding effort in an activity, men have been shown to exert higher effort than women (Waaler et al., 2012). Concerning passion and gender of participants, the research has shown mixed results. That is, in some studies, no gender effects are reported (Philippe et al., 2009; Vallerand et al., 2008), whereas other studies have shown higher obsessive passion scores among men than women (Forest et al., 2011; Philippe et al., 2009).

To sum up. Based on the theory and research presented, the following hypothesis regarding the links between desire for excitement, autonomy support, passion, intrinsic motivation and effort were tested: (1) desire for excitement would positively predict perceived autonomy support and harmonious passion; (2) autonomy support would positively predict harmonious passion; (3) harmonious passion

would be positively linked to change in intrinsic motivation, which again would positively predict change in effort. In addition we explore the role of length of experience as a moderator in the desire for excitement – passion link, we explore the link between desire for excitement and obsessive passion, and we use gender as a control variable. Indirect links between the variables are also investigated (see figure 1).

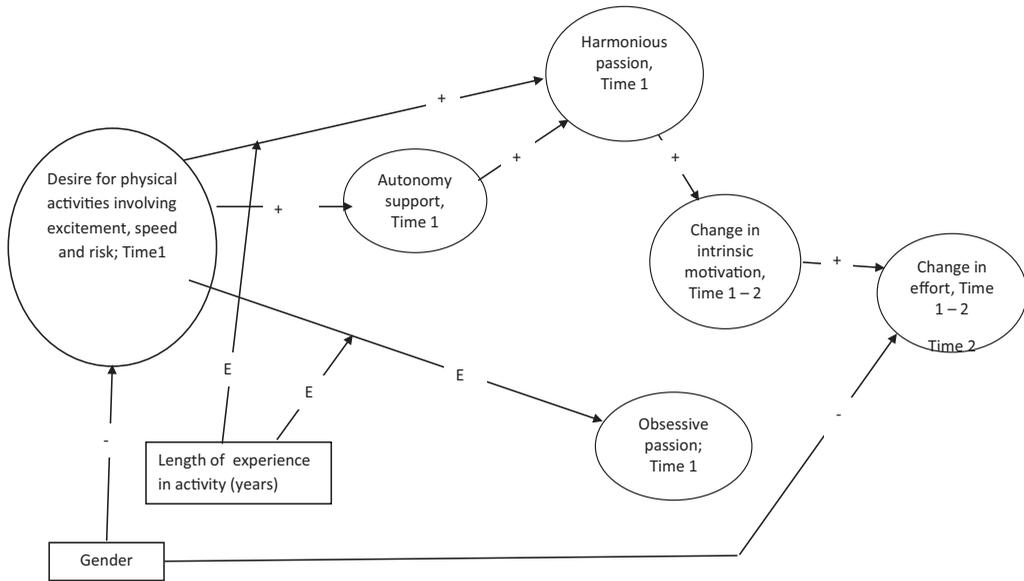


Figure 1. The theoretical model (E represents explorative links, and + or – represent predicted links)

## Method

### Participants

The individuals who participated attended a one-year study of their favorite outdoor life sport or physical activity at Norwegian Folk High Schools. Examples of sports are hunting, fishing, mountain climbing, kiting, sailing, surfing, off-road bicycling, off-piste skiing, dog mushing, and snowboarding.

Students who gave their informed consent ( $N = 675$ ;  $M = 19.0$  yr.;  $SD = 1.1$ ) completed a questionnaire package about 1 month into the school year. Of the students included at Time 1, 447 of them completed a second questionnaire package eight months later.

### Questionnaire assessments

*Desire to engage in physical activities involving excitement, speed, and risk* was measured by a short and generalized scale of the Thrill and Adventure Seeking Scale (Zuckerman,

1983, 1984; Zuckerman et al., 1978). Because the students had chosen their outdoor physical activity for the upcoming year, we asked the following two questions adapted to their choice of physical activity: “By practicing your chosen outdoor physical activity for the next year; (1) How important is it for you to engage in situations involving excitement and speed?”; and “(2) How important is it for you to engage in situations involving risk?” Students responded to the questions using a scale varying from 1 (*not important at all*) to 7 (*very important*). The correlation between the two items was .65.

*Perceived Autonomy Support* was assessed by the Exercise Climate Questionnaire. This scale was adapted to physical exercise from the Health-Care Climate Questionnaire (Williams, et al., 1996). This six-item scale assesses students’ perceptions of the degree to which their teacher was supportive of autonomy. The items were responded to on a 1 (*strongly disagree*) to 7 (*strongly agree*) scale. A sample item is: “I feel that my teacher has provided me with choices and options about my outdoor physical activity.” This scale has been tested in Norway and has yielded good internal consistency and validity among students (Waaler et al., 2012).

*Harmonious and Obsessive Passion* was assessed with the 14-item Passion Scale developed by Vallerand et al. (2003). Sample items for harmonious passion are: “This activity is in harmony with the other activities in my life” and “This activity reflects the qualities I like about myself.” For obsessive passion, sample items are: “The urge is so strong, I cannot help myself from doing this activity,” and “I have a tough time controlling my need to do this activity.” Students’ responses to items could vary from 1 (*do not agree at all*) to 7 (*very strongly agree*). Previous validity and reliability indications for the scale have been documented as acceptable by several studies (Halvari et al., 2009; Vallerand et al., 2006).

*Intrinsic Motivation and Effort* were assessed by the Intrinsic Motivation Inventory (McAuley et al., 1989) adapted to the physical activity domain. Participants responded to the seven-item intrinsic motivation subscale and the five-item effort subscale using a seven-point scale ranging from 1 (*not at all true for me*) to 7 (*very true*). An intrinsic motivation sample item is: “Doing my outdoor physical activity is fun.” A sample item for effort is: “I put a lot of effort into my outdoor physical activity.” Psychometric attributes, as examined by McAuley et al. (1989), yielded acceptable reliability and validity indications for the scale.

Length of experience was indicated by the number of years they had pursued their outdoor physical activity.

### Completers vs. dropouts

Of the 675 participants, 228 (35%) dropped out from Time 1 to Time 2. Study continuation (completers = 0; dropouts = 1) was analyzed by logistic regression from Time 1 independent measures of desire for excitement, autonomy support, harmonious and obsessive passion, age, and gender. Analyses indicated that dropout was not due to Time 1 measures of desire for excitement ( $B = -.01$ ,  $SE = .06$ ,  $p > .10$ ),

obsessive passion ( $B = -.12$ ,  $SE = .08$ ,  $p > .10$ ), age ( $B = .04$ ,  $SE = .07$ ,  $p > .10$ ) or sex ( $B = .18$ ,  $SE = .16$ ,  $p > .10$ ). Compared to completers, at Time 1, dropouts perceived significantly less autonomy support ( $B = -.19$ ,  $SE = .10$ ,  $p < .05$ ), lower harmonious passion ( $B = -.26$ ,  $SE = .09$ ,  $p < .01$ ), lower intrinsic motivation ( $B = -.27$ ,  $SE = .10$ ,  $p < .01$ ), and lower effort ( $B = -.21$ ,  $SE = .10$ ,  $p < .05$ ).

## Results

### Descriptive statistics and reliability

Means, standard deviations, ranges, and reliabilities are presented in Table 1. The internal consistency of variables was good; they all exceeded the threshold value of .70 defined by Nunnally (1979), except the effort variable with an alpha value = .64.

Table 1. Pearson correlations among variables. Reliability coefficients ( $\alpha$ ) are inserted in the diagonal.

	<i>M</i>	<i>SD</i>	Obs. range	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.
1. Autonomy support; T1	5.68	0.91	1.2–7.0	.86												
2. Desire for excitement, speed & risk; T1	5.38	1.27	1.0–7.0	.12	.76 <sup>1</sup>											
3. Harmonious Passion; T1	4.95	0.94	1.4–7.0	.32	.18	.83										
4. Obsessive Passion; T1	2.64	1.05	1.0–6.3	.09	.27	.49	.82									
5. Intrinsic motivation; T1	6.12	0.88	1.4–7.0	.35	.17	.70	.31	.84								
6. Intrinsic motivation; T2	6.13	0.85	2.3–7.0	.27	.10	.49	.22	.57	.84							
7. Change in intrinsic motivation; T1 – T2	0.00	1.00	-5.5–2.2	.04	.06	.14	.05	.00	.81	--						
8. Effort; T1	5.61	0.84	2.6–7.0	.31	.15	.52	.22	.56	.41	.12	.64					
9. Effort; T2	5.50	0.90	2.8–7.0	.24	.12	.37	.19	.38	.67	.48	.53	.64				
10. Change in effort; T1 – T2	0.00	1.00	-3.4–2.1	.09	.07	.15	.08	.12	.53	.50	.00	.85	--			
11. Length of experience in activity (years)	6.92	6.07	1–20	-.04	-.12	.02	-.19	-.03	.01	.04	-.03	-.04	-.01	--		
12. Age	19	1.09	16–37	.04	-.07	-.01	-.05	-.06	.00	-.02	-.05	-.02	-.01	.04	--	
13. Gender (Males = 1; Females = 2)	1.59	0.49	1.0–2.0	-.05	-.19	-.05	-.17	-.03	-.04	-.04	.00	-.08	-.12	.23	-.05	--

Note. Correlations in bold are significant at the .05 level, two-tailed tests. N varies from 632–675 for Measures 1–5, 8, and 11–12 (Time 1) and from 403–447 for Measures 6–7 and 9–10 (Time 2) because of items not responded to by some of the participants. <sup>1</sup>  $r = .65$  between the two items. Change scores (standardized residuals) were created by regression of T2 measures onto T1 measures.

Descriptive data indicated that the sample under study were really passionate toward their activity, because on the seven-point scale used for the passion items they agree that they “use much time on their outdoor activity” ( $M = 4.25$ ,  $SD = 1.38$ ), “like their outdoor activity” ( $M = 6.37$ ,  $SD = 0.94$ ), and “perceive their outdoor activity as personally important” ( $M = 5.53$ ,  $SD = 1.29$ ). These three items are normally used in order to evaluate participants’ degree of passion according to the theoretical definition given above for passion in general (Mageau et al., 2009).

### Hypotheses testing

*Theoretical model.* The purpose of the study was to test the hypotheses that the desire for excitement would positively predict perceived autonomy support, and that

autonomy support would positively predict harmonious passion, which in turn would be positively linked to change in intrinsic motivation, which again would positively predict change in effort. The zero-order correlations presented in Table 1 indicated support for these hypotheses. The desire for excitement was significantly positively correlated with obsessive passion. Participants with short experience in the activity, relative to those with long experience and males, reported a higher desire for excitement and a higher obsessive passion. Males reported higher scores on change in effort and shorter length of experience than females. However, the final test of all hypotheses, included the indirect ones, and the links we tried to explore, has to await further multivariate analyses (see below).

*Structural equation modelling.* LISREL (Version 8.72) was used to test the measurement and the structural model with hypothesized and explorative links. We evaluated the model fit by using the chi-square likelihood ratio ( $X^2$ ), the Root Mean Square Error of Approximation (RMSEA), the Comparative Fit Index (CFI), the Incremental Fit Index (IFI), and the standardized root-mean-square residual (SRMR). The fit values for these indices are considered good for RMSEA and SRMR if they are close to or lower than .06 and .08, respectively. CFI and IFI values are considered good if they are close to or higher than .95 (Bollen, 1989; Hu & Bentler, 1999).

Due to the large number of indicators (items) in relation to the sample size, the model in Figure 1 was tested based on a combination of four latent variables (i.e., desire for excitement with two items/indicators, autonomy support with two parcels of items as indicators, and harmonious and obsessive passion, each with three parcels of items as indicators). For the variables parceled, we followed the procedure recommended by Little et al. (2002) in which all items for each variable were randomly assigned to the parcels. In addition, change in intrinsic motivation and change in effort were used as observed variables. The model was tested with 15 indicators/variables, including gender, length of experience in activity, and the interaction of desire for excitement by length of experience.

*Empirical models.* The measurement model was tested and found to fit the data [ $X^2$  ( $df = 60$ ) = 185.51,  $p < .001$ ; SRMR = .033; CFI = .97; IFI = .97; RMSEA = .054]. This measurement model was included in the subsequent tests of the hypothesized/explorative structural model and the final model. In testing these models, we let harmonious passion and obsessive passion co-vary. The explorative/hypothesized model yielded good fit indices [ $X^2$  ( $df = 83$ ) = 263.89,  $p < .001$ ; SRMR = .050; CFI = .96; IFI = .96; RMSEA = .056].

In the final model, we added a negative path from gender to obsessive passion, as shown by some previous research (Forest et al., 2011; Philippe et al., 2009), and a negative path from length of experience in activity to obsessive passion, because modification indices suggested so. In addition to gender, which predicted length of experience (females with the highest scores), these paths were significant, and the

final model was further improved relative to the explorative/hypothesized model [ $X^2 (df = 82) = 217.24, p < .001$ ; SRMR = .042; CFI = .97; IFI = .97; RMSEA = .048]. All paths were significantly supported (see Figure 2).

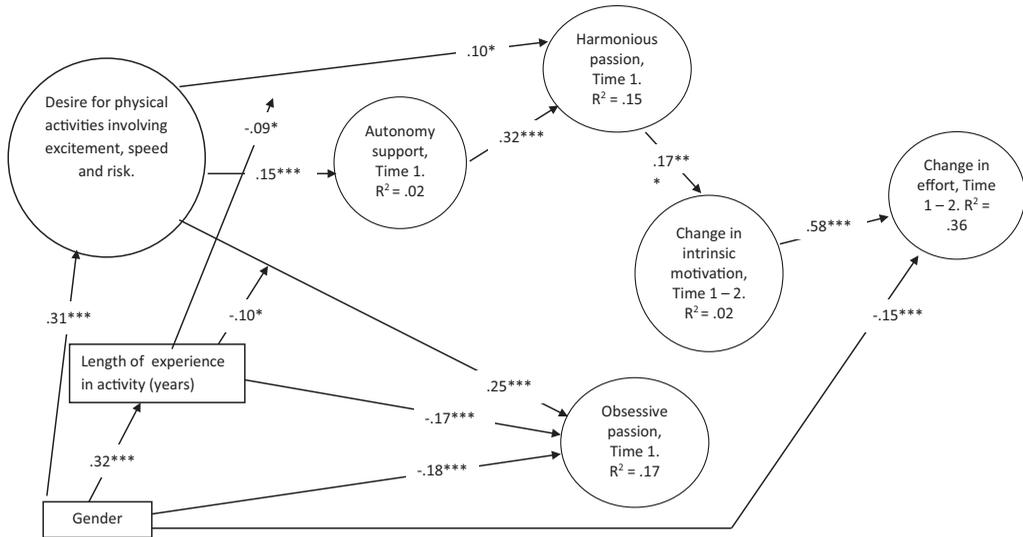


Figure 2. Standardized parameter (regression) estimates depicting the relations in the structural model. ( $X^2 (df = 82) = 217.24, p < .001$ ;  $X^2/df = 2.64$ ; SRMR = .042; CFI = .97; IFI = .97; RMSEA = .048, 90% CI for RMSEA [.041 .056]). Factor loadings for indicators and error variances are not included in order to simplify the presentation. \* $p < .05$ ; \*\*\* $p < .001$ .

### Tests of indirect links

The indirect links in Figure 2 were simultaneously tested with the structural model in LISREL. The indirect links expected between autonomy support and changes in intrinsic motivation, and changes in effort, were supported (see Table 2). In addition, the desire for excitement was indirectly positively associated with harmonious passion through autonomy support, indirectly positively linked to change in intrinsic motivation through autonomy support and harmonious passion, and indirectly linked to change in effort through all three mediating variables; autonomy support, harmonious passion, and change in intrinsic motivation. Further, harmonious passion was indirectly linked to change in effort through change in intrinsic motivation (see Table 2).

Both the personal desire for excitement and contextual autonomy support hold as predictors of longitudinal adaptive outcomes among students if the activity is regulated by harmonious passion. All indirect links were fully mediated, except autonomy support, which is a partial mediator of the link between the desire for excitement and harmonious passion, because desire for excitement still predicted harmonious passion.

Table 2. LISREL tests of indirect links emerging in Figure 2

Independent variable	Mediating variables	Dependent variable	Effect	SE	Z-value
1. Gender	→ Desire for excitement	→ Autonomy support	-0.05	0.02	-3.51***
2. Gender	→ Desire for excitement	→ Harmonious passion	-0.05	0.02	-3.44***
3. Gender	→ Desire for excitement	→ Obsessive passion	-0.19	0.03	-6.64***
4. Gender	→ Desire for excitement → Autonomy support → Harmonious passion	→ Change in intrinsic motivation	-0.01	0.00	-2.55*
5. Gender	→ Desire for excitement → Autonomy support → Harmonious passion → Change in intrinsic mot.	→ Change in effort → Harmonious passion	-0.01	0.00	-2.51*
6. Desire for excitement	→ Autonomy support	→ Harmonious passion	0.05	0.01	3.41***
7. Desire for excitement	→ Autonomy support → Harmonious passion	→ Change in intrinsic motivation	0.02	0.01	2.67*
8. Autonomy support	→ Harmonious passion	→ Change in intrinsic motivation	0.04	0.01	3.33***
9. Desire for excitement	→ Autonomy support → Harmonious passion → Change in intrinsic motivation	→ Change in effort	0.01	0.01	2.64*
10. Autonomy support	→ Harmonious passion → Change in intrinsic motivation	→ Change in effort	0.03	0.01	3.26***
11. Harmonious passion	→ Change in intrinsic motivation	→ Change in effort	0.09	0.02	3.65***

\*  $p < .05$ ; \*\*\*  $p < .001$

Gender significantly predicted the desire for excitement, which means that male students are more excitement seeking than females. Thus, the significant indirect links between gender and all other study variables, through the desire for excitement, indicate that males perceive more autonomy support, and both more harmonious passion and more obsessive passion. In addition, males also experience higher changes in intrinsic motivation and higher changes in effort through the mediating effects of the desire for excitement, autonomy support, and harmonious passion.

### Moderator analysis

The moderator effect of length of experience on the associations between the desire for excitement and the two types of passion was included in the LISREL test of the structural model. In order to illustrate these moderator effects, two hierarchical regressions were performed (see figure 3 and 4).

The results of the hierarchical regression of harmonious passion yielded an additional explanatory power of 1% from entering the interaction of the desire for excitement and length of experience into the model [ $F_{\text{Change}}(1,485) = 4.78, p < .05, \beta = -.09, p < .05$ ]. For the regression of obsessive passion, the interaction also increased the explained variance by 1% [ $F_{\text{Change}}(1,486) = 5.54, p < .05, \beta = -.10, p < .05$ ]. This indicated that length of experience moderates the relation between the desire for excitement and passion (Cohen et al., 2003). This means that the desire for excitement predicted obsessive passion strongly among those with little experience, relative to those more experienced. In addition, the desire for excitement predicted harmonious passion more strongly among those with long experience, than among those with short experience.

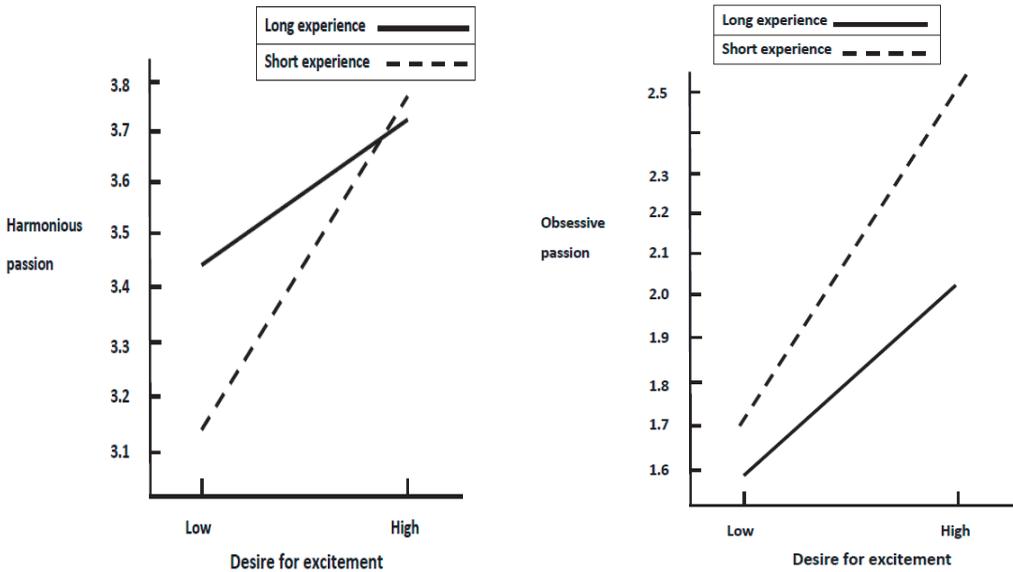


Figure 3 and 4. Simple regression lines depicting the moderator effect of length of experience in activity (years) on the relation between the desire for excitement and harmonious passion and simple regression lines depicting the moderator effect of length of experience in activity (years) on the relation between the desire for excitement and obsessive passion.

## Discussion

The present study tested the role of the sensation seeking personality in a model where we tested the links between autonomy support, passion, and positive outcomes, such as intrinsic motivation and effort in outdoor activity. The study indicates that length of experience in outdoor physical activity moderates the link between the desire for excitement and obsessive passion. That is, the desire for excitement predicts obsessive passion more strongly among those with little experience, relative to those more experienced.

The study links the desire for excitement, speed, and risk positively indirectly to positive outcomes through harmonious passion. In addition, autonomy support predicted the two outcomes in the same manner, as shown in the literature (Mageau et al., 2009; Waaler et al., 2012). This study links the desire for excitement to obsessive passion. These results may be in line with the literature indicating that intense pleasure-pursuit among hypomania-prone individuals can result in high achievement, mastery, and utility of their resources in adaptive ways, but can also result in harmful consequences associated with mania (Meyer et al., 2007).

Theoretically, obsessive passion is experienced when a person feels pressured to engage in the activity and has to pursue it in order to be accepted and feel worthy by significant other people in the social context. Or they have to do it because the person cannot resist the excitement temptations inherent in the activity (Vallerand,

2007). The literature indicates that obsessive passion is associated with introjection and external motivations, psychological mal-adjustment, rigid persistence, chronic illness, conflict between activity engagement, other aspects of one's life, and inconsistent performance results, dependent on what type of achievement goals are adopted (Dietrich, 2012; Vallerand, 2008; Vallerand et al., 2003, 2008). Thus, the personal desire for excitement, speed, and risk may be harmful if linked to the development of an obsessive passion for an activity.

The autonomy-supportive context gives us some ideas on how to stimulate young adults in developing harmonious passion for an activity resulting in positive outcomes. When persons choose to pursue an adequate source of stimulation, which are socially acceptable outlets, such as downhill skiing and mountain climbing, autonomy support becomes important. Both teachers and friends can be autonomous supportive by providing an understanding attitude toward the pleasure-pursuit personality of the person and by acknowledging their feelings and perspectives, encouraging self-initiation and exploration of new experiences, and encouraging exercising of numerous repetitions of security procedures, which are not fun, but important and meaningful in order to prevent serious injuries. Autonomy support can also be provided by avoiding communicating pressuring expectations and introjection assertions, and instead offering choice among different types of exercises and training methods that may help the participants to attain their personal goals (Williams et al., 1996). Thus, the autonomy supportive social context satisfies the needs for competence, relatedness, and autonomy which again promotes increases in autonomous types of motivation, as shown in the literature (Deci & Ryan, 2000; Waaler et al., 2012). The harmonious passion itself and the adaptive consequences of harmonious passion are expected to be grounded in part by its origin in autonomous motivation, because types of such motivation (i.e., intrinsic and identified) have been positively linked to persistence, flexibility, and reflective thinking – activities which are by nature intentional and related to future plans for their behavior (Deci & Ryan, 2000). The present results may therefore have some parallels to other research on the concept of deliberation (i.e., the success vs. failure to plan ahead; acting based on careful thinking vs. impulsive acting), which seem to protect individuals against choosing risk taking activities with negative outcomes (Fischer & Smith, 2004).

Autonomy support is indeed important for participants' autonomous identification with an activity, as well as with the value of appropriate times to pursue their favorite activity in a flexible way by taking the needs of others into account. Autonomy support may help them to learn to plan their activities and become more harmonious in pursuing their passion. Autonomy support may also be important for participants to make assessments and pursue their favorite activity in a safe way. Hence, future research on autonomy support and decision making, and how young adults could be trained in making decisions for stimulating activities, are warranted (Rolison & Scherman, 2002).

The result emphasizing that intrinsic motivation was positively predicted by the desire for excitement and autonomy support, indirectly through harmonious passion, is important. Besides the clear positive link between intrinsic motivation and effort, literature reviews have documented numerous positive consequences of intrinsic or autonomous types of motivation, such as higher perceived competence, more interest, enjoyment, positive attitudes, commitment, less dropout, greater conceptual understanding, learning, more creativity, better grades, goal attainment, greater adjustment, and well-being (Deci & Ryan, 2000). Hence, significant other people, such as supervisors, teachers, coaches, and friends, may play an important role in supporting the autonomy of participants in outdoor physical activity. This is because autonomy support has the potential to positively nurture both harmonious passion and change in intrinsic motivation, which have been shown to be positively linked to numerous adaptive consequences.

The length of experience moderated the link between desire for excitement and obsessive passion. To our knowledge, this is the first time the desire for excitement is shown to predict obsessive passion more strongly among those with little experience in their outdoor physical activity, relative to those more experienced. Could it be that the longer the experience, the more they become experts in their field of activity and learn to regulate their desire for excitement in an adaptive way, which reduces obsessive passion? These results are in line with the model presented by Bonneville-Roussy et al. (2017), where they investigate the role of passion in the development of expertise. The results give new knowledge regarding the desire for excitement as a personal factor and how this factor relates to passion when it comes to length of experience in outdoor physical activity.

Scores on the desire for excitement were higher among males than among females. Compared to females, males also report higher scores on autonomy support indirectly through the desire for excitement, harmonious passion, and obsessive passion. Males may, more than females, experience positive outcomes as a consequence of the desire for excitement, which at the same time also can be relatively more harmful and result in obsessive passion (Meyer et al., 2007).

A practical implication for teachers working in folk high schools is that autonomy support is the key factor in helping the students develop a harmonious passion towards their activity, resulting in positive consequences like intrinsic motivation and more effort. Teachers can be autonomy supportive by acknowledging students' feelings and perspectives, encouraging self-initiation and exploration of new experiences, avoiding communicating pressuring expectations, and instead offering choice among different types of exercises and training methods that may help the participants to attain their personal goals.

It is also important to be aware that the boys and girls score different on the desire for excitement and passion towards their favorite activity, and that the desire for excitement is shown to predict obsessive passion more strongly among those with little experience in their outdoor physical activity, relative to those more experienced.

Regarding study continuation, 35% of the participants dropped out from Time 1 to Time 2. Analyses indicated that dropouts (relative to completers) perceived significantly less autonomy support, lower harmonious passion, lower intrinsic motivation, and lower effort in their activity at the start of the study. Hence, the dropouts from the study affected reduction in the variance of these variables, which might have reduced the strength of the correlations. Because the dropout analyses were based on logistic regression, the results indicate the usefulness of autonomy support, intrinsic motivation, harmonious passion, and effort to predict study continuation over 8 months.

### **Limitations**

In the models tested using structural equation modeling, the direction between variables is indicated. This was grounded in theory and previous experimental and longitudinal research (Burton et al., 2006; Münster Halvari et al., 2012; Waaler et al., 2012) supporting the effects of autonomy on adaptive and healthy functioning. However, because the research designs were not experimental, conclusions regarding causality cannot be drawn. Further, the longitudinal design used could be improved by adding a third wave of data, which makes it possible to test true mediations (Cole & Maxwell, 2003). Due to this, we are limited to testing and describing indirect links. Instead of self-report measures of effort in an activity, physiological and/or observed ones might indeed be better in future research on excitement-seeking, autonomy support, and passion.

### **Conclusion**

The desire for excitement positively predicted perceived autonomy support and the two types of passion. Autonomy support positively predicted harmonious passion, which in turn was positively linked to change in intrinsic motivation, which again positively predicted change in effort. Length of experience moderated the link between desire for excitement and obsessive passion. Furthermore, participants with short experience in the activity, relative to those with long experience and males, reported a higher desire for excitement and a higher obsessive passion.

Autonomy support is important for young adults pursuing outdoor activities, giving experiences of excitement, speed, and risk. In such a social context, their excitement-seeking personality is understood by significant other people who encourage them to further explore and improve their skills. Autonomy support might help them to choose activities providing excitement arousal in a way that leads to harmonious passion, intrinsic motivation, and effort, instead of high-risk activities with negative consequences. The positive predictive effect of autonomy support holds to intrinsic motivation and effort in the activity 8 months later, through harmonious passion. In the model tested, no negative effects of autonomy support were revealed.

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## Students' personal desire for excitement and teachers' autonomy

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