

Motivational antecedents of physical activity in Finnish youth

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Abstract

The purpose of this study was to examine the associations of motivational antecedents, specifically goal orientation, amotivation, intrinsic motivation, and intention to be physically active with physical activity of 786 ninth grade Finnish school pupils. LISREL path models were constructed separately for sport club physical activity and for leisure time physical activity. Both estimated models provided a reasonable fit for the data. Task orientation predicted high intrinsic motivation and low amotivation. Intrinsic motivation predicted high levels, and amotivation low levels of intention to be physically active. Physical activity was most strongly predicted by intrinsic motivation. Intention predicted directly physical activity, whereas amotivation predicted low levels of physical activity. Task orientation, ego orientation, amotivation and intrinsic motivation had also statistically significant indirect effects on physical activity.

Key words: physical activity, intention, motivation, goal orientation

Introduction

Research has provided a convincing body of evidence showing the importance of physical activity in health promotion (Blair, 1993; Tuson & Sinyor, 1993). However, the role of the factors underlying the stability of a physically active lifestyle is largely unclear (Malina, 1990). School physical education may play an important role in the socialisation process into a physically active lifestyle. This is because of its potential to provide positive experiences of physical activity to the whole student population (Vlachopoulos, Biddle & Fox 1996). When children experience positive affect from their involvement in activity during childhood, they are more likely to become involved in physical activity later as adults (Haywood, 1991). The few longitudinal studies which have been carried out on the area give support to the hypothesis that physical activity in childhood predicts physical activity in adulthood (Engström, 1991; Telama, Yang, Laakso, & Viikari, 1997; Vanreusel, Renson, & Beunen, 1993).

Although much of the research on the role of physical activity on mental and physical health development has focused on the effects of chronic exercise, attention has recently been given to the psychological effects of acute bouts of physical exercise (Rejeski, Gregg, Thompson, & Berry, 1991). It has been argued that subjective feeling states during and following an activity are likely determinants of adoption and maintenance of physically active lifestyles (Rejeski, 1992). These affects have an important role as mediators of other positive psychological and behavioural effects ascribed to exercise, such as quality of sleep and lowered levels of anxiety and depression.

The perceived emotions in physical activity are influenced by the cognitive interpretations of the situation. Psychological effects of the activity are more closely related to cognitive evaluations of performance feedback rather than to the exercise stimulus itself (Gauvin & Rejeski, 1993). However, the evidence that exists on the effects of physical activity on the generation of affect is generally limited to studies using samples from adult populations,

making the need to investigate this relationship with children more apparent (Vlachopoulos et al., 1996). In addition, as Bozoian, Rejeski, and McAuley (1994) point out, studies that have investigated the effects of exercise on psychological responses have mostly been conducted without employing a theoretical framework.

There are several approaches explaining the role of various factors affecting adherence. According to the sport involvement model (Scanlan, Carpenter, Schmidt, Simons, & Keeler, 1993), sport enjoyment, involvement alternatives, personal investments, social constraints, and involvement opportunities affect sport involvement. Nolan and Feldman (1984) present several social factors and cues to action, e.g. health education, which lead individuals to the readiness to exercise. Also self concept values, e.g., physical appearance, may affect physical activity. Research has shown several barriers, such as intensive training programme, and exercising alone, as well as encouraging factors, such as moderate intensity, social support, the availability and proximity of community facilities, and environment, and educational campaigns (ISSP, 1999).

The interaction between attitudes and action has been under scrutiny since the work of Ajzen (1985; 1991), who has presented the theory of planned behaviour. The theory consists of an assumption that behaviours are performed for a reason – that people think about the consequences of their actions and make deliberate decisions to achieve some outcomes and avoid others. The theory assumes that intention is the main antecedent of behaviour. Empirical studies in physical education have given support to the predictive role of intention into physical activity. However, intention may not be enough for behavioural changes. External factors, e.g., the availability of sport equipment and facilities, and social support, along with psychological readiness determine if a person adheres to a physically active lifestyle.

The transtheoretical model (Prochaska & Velicer 1997) suggests that there are several processes and stages of change. The relationship between the processes of change and the

stages of change can be hypothesised to be mediated by the social cognitive constructs contained within the theory of planned action (Courneya & Bobick 2000).

The cognitive evaluation theory (Deci & Ryan, 1985; 1991; 1995) suggests that there are three primary psychological needs - autonomy, competence and social relatedness - which lead individuals to seek and meet optimal challenges which result in healthy development of the self. These three needs are seen as the corner stones of intrinsic motivation.

Thus, every incident which reinforces perceived competence increases intrinsic motivation, and conversely, events that diminish perceptions of competence will reduce intrinsic motivation. However, intrinsic motivation can only flourish in an atmosphere of self-determination or autonomy. Several experimental studies have shown that rewarding people for an activity which already in itself is interesting brings about a decrease of interest (Deci & Ryan, 1985). This is seen as a result of the change in the perceived locus of causality from intrinsic to extrinsic.

In order to maintain motivation a child needs a sufficient amount of positive reinforcement. This can take the form of acceptance, positive feedback or strengthening of independence by significant others. According to Harter (1981), it is important that reinforcement is given during the early stages of the child's development and that expressly goal-oriented trials are reinforced, not only the success in them. Also, central for motivation is the development of self-evaluation skills which increase intrinsic feedback. A child who is intrinsically motivated in a cognitive, social or physical domain of activity, perceives competence in that area and a degree of independence concerning the regulation of that activity (Harter, 1978).

Motivation can be seen as a continuum ranging from amotivation through four different stages of extrinsic motivation to intrinsic motivation. True intrinsic motivation is defined as pleasure of knowledge, accomplishment and stimulation (Pelletier, Fortier, Vallerand, Tuson, Briere, & Blais, 1995).

Goal orientation model (Nicholls, 1984; Roberts, 1992) is a social cognitive approach to understand motivational processes in achievement settings. It has been used as a basis for recent classroom (Ames, 1992) and sport studies (Duda & Whitehead, 1998; Roberts, 1992). Although studies on children's achievement motivation have yielded several motivational factors, the two goal perspectives dominant in performance settings are task (self-referenced) and ego (other-referenced) goal orientations. These refer to how success is perceived and competence evaluated (Nicholls, 1989).

An orientation to task or ego involvement is a function of individual differences as well as situational factors in orientating the individual towards self improvement or normative comparison. Specifically, past experience in predominantly task or ego involving contexts and/or social group membership can relate to the development of a personal disposition toward mastery (task) or social comparison based (ego) goals (Ames, 1992; Nicholls, 1989). Nicholls (1984) suggests that these two different goal perspectives relate to important differences in behaviour. It is expected that when the child focuses on task-involving goals a more adaptive motivational pattern should result, regardless of whether the child has high or low perceived competence. It is also hypothesised that children should not experience motivational problems when emphasising ego involving goals as long as they are confident in their physical competence. Maladaptive motivational patterns result when the child is in a state of ego involvement and has doubts about the adequacy of her/his competence to meet the task at hand (Duda, 1993; Roberts, 1992). A task-oriented goal perspective has been found to be associated with increased enjoyment and intrinsic motivation towards sport and physical activity, regardless of competence level or competitive outcome (Duda & Nicholls, 1992; Duda & Whitehead, 1998; Fox, Goudas, Biddle, Duda, & Armstrong, 1994; White & Duda, 1994). Task orientation has also been found to be associated with continuing to participate in sports (Fox et al., 1994). Empirical evidence has not been presented showing that task orientation would be a predictor of physical activity. Instead, task orientation has been found

to predict intention (Lintunen, Valkonen, Leskinen, & Biddle, 1999). This finding is in line with Liukkonen's (1998) empirical evidence that goal orientation represents a "cognitive filter" regulating the perceptions of physical activity. Thus, intention can be regarded as mediating variable between motivational factors, such as goal orientation and intrinsic motivation, and physical activity.

Research problems

The aim of this study was to examine the associations of motivational antecedents with physical activity of 9th grade Finnish school pupils. Following detailed research problems were set:

1. How is goal orientation associated with physical activity in leisure time and in sport clubs?

Hypothesis: task orientation is positively associated with physical activity in both leisure time and in sport clubs.

2. How are intrinsic motivation and amotivation associated with physical activity in leisure time and in sport clubs?

Hypothesis: intrinsic motivation is positively, and amotivation negatively associated with physical activity in both leisure time and in sport clubs.

3. How is intention to participate physical activity associated with physical activity in leisure time and in sport clubs?

Hypothesis: intention to participate is positively associated with physical activity in both leisure time and in sport clubs.

4. What is the role of intention in explaining physical activity?

Hypothesis: intention is a mediating variable between motivational factors, specifically task and ego orientation, amotivation, and intrinsic motivation, and physical activity.

Method

Participants

The participants of the study were 786 Finnish ninth grade pupils representing eight different schools from South and Middle Finland. The data was collected during spring 1999.

Measures and variables

The pupils responded to the *Perception of Success Questionnaire* (POSQ; Roberts, Treasure, & Balaque, 1998), which was used in this study for several reasons. First, the scores of the original English version of the POSQ has been found to have a high level of reliability and validity (Duda & Whitehead, 1998). Secondly, also the Finnish version of the scale (Liukkonen, 1998) has been found to have a sound psychometric basis in youth soccer (Liukkonen & Leskinen, 1999), as well as in 9th grade school pupils (Liukkonen, Telama, Jaakkola, & Sepponen, 1997).

The *Sport Motivation Scale* (SMS; Pelletier et al., 1995) including amotivation, external regulation, introjected regulation, identified regulation, and intrinsic motivation was used in this study because it is the only scale presented in physical activity domain, which includes dimensions representing the amotivation - external motivation - intrinsic motivation continuum. The constructive and predictive validity of the original English version of the SMS have been shown to be satisfactory. Instead of the generally used back-translation method, the Finnish version of the scale was translated for this study using a “panel of experts” –method.

Four sport psychology researchers translated the items independently, and in cases of discrepancy, the meaning of the item was discussed until the common solution was found.

In previous studies using the Sport Motivation Scale, a relative autonomy index (RAI) has been formulated by weighing intrinsic motivation dimensions and identified regulation positively, and introjected regulation and external regulation negatively. Due to high correlations (.55 through .68) between the three motivation continuum dimensions (intrinsic, introjected, and identified) in this study, intrinsic motivation variable was constructed by calculating the mean of the items included in these three dimensions. External motivation did not correlate either with intention or with physical activity.

A three-item scale was created for the purpose of this study to measure *intention to participate in physical activity* (“I would participate in PE lessons if it was voluntary”, “I think that at the age of 20, I will participate in sport”, and “I would like to have more PE lessons at the present”). Responses for these scales were indicated on a 5-point Likert scale (1=strongly disagree, 5=strongly agree).

In addition, the pupils responded to one question about the *frequency of physical activity* in sport clubs, and a two-item scale measuring the frequency and intensity of physical activity during leisure time. Due to the low correlation (.16) between the frequency of leisure time and sport club activity, these two physical activity variables were analysed separately, sport club activity by a single item, and leisure time activity by a two-item sum variable including both frequency and intensity, after recoding the intensity item into four categories.

For the purposes of possible further cross-cultural comparison, the items measuring physical activity in this study are those validated in previous international comparative studies (Nupponen & Telama, 1998).

Mean scores were calculated to form the task and ego orientation sub-scales of the POSQ, as well as in the case of amotivation and intrinsic motivation sub-scales of the SMS. Direct sums were calculated from the intention scale.

Data analysis

Path models were used to analyse direct and indirect relationships between the independent variables (task/ego orientation, intrinsic/amotivation, and intention), and the dependent variables (physical activity in leisure time and in sport clubs). The path models were estimated and tested by using the LISREL 8.30 program (Jöreskog, Sörbom, Du Troit, & Du Troit, 1999).

Results

The level of pupils' task orientation was higher than that of ego orientation. They participated in physical activity during leisure time more often than in sport clubs. The Cronbach alpha coefficients showed that all variables had a satisfactory level of internal reliability. The skewness of the variables was assessed using Kolmogorov-Smirnov test. Table 1 shows the means, standard deviations, Kolmogorov-Smirnov (K-S) skewness test coefficients, Cronbach alphas, and empirical minimum and maximum values of the variables (equal to the theoretical values).

TABLE 1. Means, standard deviations, Kolmogorov-Smirnov (K-S) and Cronbach alpha coefficients, and minimum/maximum values of the variables (N=773-786)

	Mean	SD	K-S		ALPHA	Min-Max
			Z	p		
1. Task orientation	4.16	.75	3.7	.000	.87	1-5
2. Ego orientation	3.19	1.04	1.4	.052	.91	1-5
3. Intrinsic motivation	10.00	2.33	2.1	.000	.92	3-15
4. Amotivation	2.32	.92	2.7	.000	.74	1-5
5. Intention	11.00	3.51	3.8	.000	.79	3-15
6. PA in sport clubs	2.05	1.17	8.7	.000	*	1-4
7. PA in leisure time	2.92	.85	4.5	.000	**	1-4

*) One-item scale **) Two-item scale

PA = Physical activity

Task orientation correlated positively with intrinsic motivation and intention, and negatively with amotivation. Intrinsic motivation and intention were associated with physical activity. The sample Pearson correlation matrix between the variables is presented in Table 2.

TABLE 2. Correlations between goal orientation, motivation, intention, and physical activity (PA)

	1.	2.	3.	4.	5.	6.
1. Task orientation						
2. Ego orientation	.17					
3. Intrinsic motivation	.44	.13				
4. Amotivation	-.23	.06	-.39			
5. Intention	.35	.04	.58	.27		
6. PA in sport club	.13	.08	.42	.27	.37	
7. PA in leisure time	.21	.08	.45	.12	.41	.45

The estimated path models were based on the sample covariance matrix of the variables. The path models were constructed separately for sport club physical activity and for leisure time physical activity. The levels of statistical significance of the path coefficients were evaluated using *t*-values. If the absolute *t*-value was greater than 2, it indicated a statistically significant path coefficient ($p < 0.05$). The estimated model for sport club physical activity (Figure 1) provided a reasonable fit to the data ($\chi^2(4) = 13.42$, $p = .009$, RMSEA = .063, SRMR = .030, GFI = .99, NFI = .99). The poor result of χ^2 -test was result of the large sample size ($N = 602$), because the value of the normed fit index (NFI) was close to one. All estimated path coefficients presented in Figure 1 were statistically significant.

Task orientation predicted high intrinsic motivation and low amotivation. Intrinsic motivation predicted high levels, and amotivation low levels of intention to be physically active. Physical activity was most strongly predicted by intrinsic motivation. Also, intention predicted directly physical activity, whereas amotivation predicted low levels of

physical activity. Task orientation, ego orientation, amotivation and intrinsic motivation in this model had also statistically significant indirect effects on sport club physical activity.

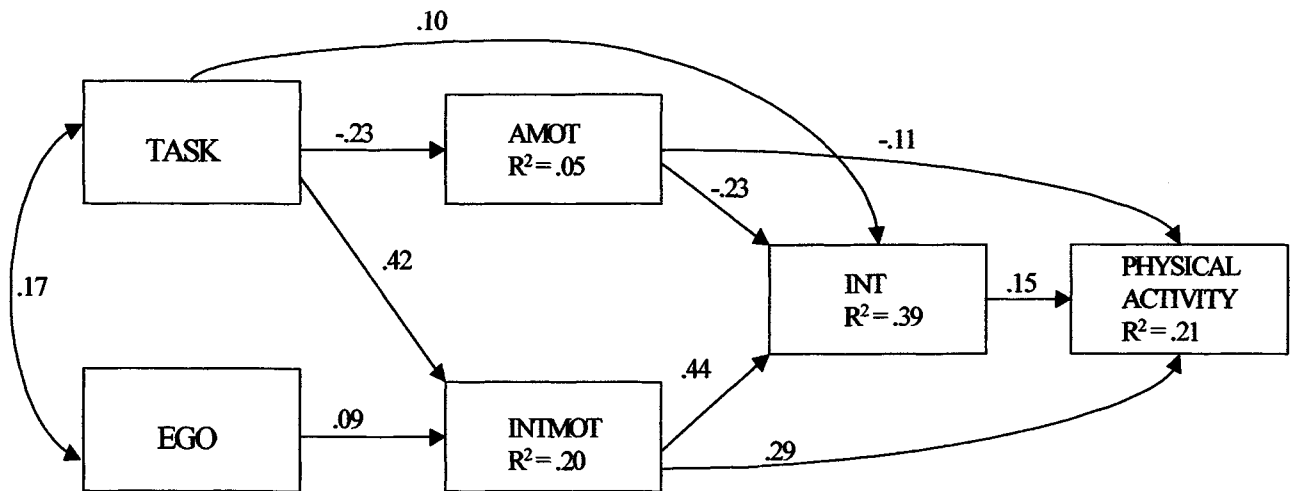


Figure 1. Estimated Path Model for Sport Club Physical Activity (Standardised Solution)

The estimated model for leisure time physical activity (Figure 2) did also fit well to the data ($\chi^2(4) = 10.21$, $p = .037$, $RMSEA = .051$, $SRMR = .026$, $GFI = .99$, $NFI = .99$). All estimated path coefficients presented in Figure 2 were statistically significant. The predictions between the variables were similar to those presented in the path model of sport club physical activity, except that amotivation predicted more strongly low leisure time physical activity. Task orientation, ego orientation, amotivation, and intrinsic motivation in this model had also statistically significant indirect effects on leisure time physical activity.

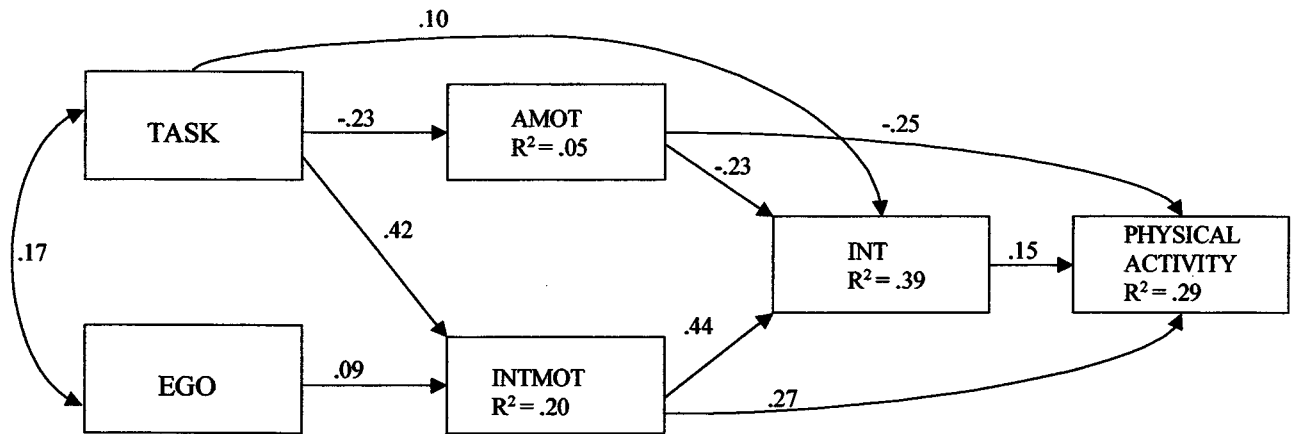


Figure 2. Estimated Path Model for Leisure Time Physical Activity (Standardised Solution)

Discussion

The purpose of this study was to examine the relationship between goal orientation, amotivation, intrinsic motivation, intention to be physically active, and physical activity. The scales used showed high levels of internal consistency and construct validity. Also predictive validity of task and ego orientation, intrinsic motivation, and amotivation scales was high. In this study, these variables were associated with physical activity and intention to be physically active, thus supporting previous studies. The physical activity items were adopted from cross-cultural comparative studies (Nupponen & Telama 1998). Instead, the intention scale was constructed for this study to represent cognitive pre-activity stages in the physical education context. Although it predicted physical activity, the association was not strong. One reason to this may be that only one of the items reflected real intention to be physically active.

The predictions between the variables in leisure time physical activity path model were similar to those presented in the path model of sport club physical activity, except that amotivation predicted more strongly low leisure time physical activity. Task orientation, ego orientation, amotivation, and intrinsic motivation had statistically significant indirect effects on both leisure time and sport club physical activity.

The results showed that 21 % of the variance of physical activity in sport club, and 29 % of the variance of leisure time physical activity were accounted for by intrinsic motivation, amotivation, and intention. The predictions between the variables in the path model for leisure time physical activity were similar to those in the path model of sport club activity, except that amotivation predicted more strongly the decrease in leisure time physical activity. Task orientation, ego orientation, amotivation and intrinsic motivation had statistically significant indirect effects on both leisure time and sport club physical activity.

As hypothesised, task orientation correlated with physical activity, although not strongly especially with sport club activity. However, it did not have a direct effect on physical activity. Instead, it predicted physical activity through intrinsic motivation, amotivation and intention. As was hypothesised, amotivation and intrinsic motivation had opposite effects on physical activity. Amotivation had a more negative role in predicting leisure time physical activity than sport club physical activity. This may reflect the role of external motivational factors in the participation in sport club activities. Sport club activity may also be of very special form of physical activity. For example, those active in golf, windsurfing, or bowling may not be active in any other forms of physical activity.

Intention was not a strong direct predictor of physical activity. Task orientation and intrinsic motivation as well as amotivation, although only in the case of sport club physical activity, predicted intention more strongly than physical activity. This result can be considered to support the theory of planned behaviour (Ajzen, 1985; 1991).

Although several factors affect physical activity, the results of this study suggest that task orientation seems to play a significant role in adulthood physical activity. Goal orientation represents a rather stable disposition, a kind of “cognitive filter” regulating perceptions of situational cues in physical activity settings.

It is noteworthy that the relative autonomy index which has been generally used as a continuum variable of motivation varying from external to true intrinsic motivation

(Pelletier et al. 1995), was not possible to be constructed in this study due to the high correlations between identification, introjection, and intrinsic motivation.

In future, an important extension to this body of research might be to analyze boys and girls separately. In previous studies, both in the physical activity and sport contexts in Finland, differences have been found in ego orientation and physical activity (Liukkonen 1998; Liukkonen et al. 1997). In addition, various contexts, such as exercise, elite sports, childrens sports, and leisure may result in different causalititions. A long-term follow-up research using age group cohorts would be most valuable if the theoretical development is desired.

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Appendix 1. The questionnaire with percentage frequencies (in bold)

Vastaa seuraaviin itseäsi koskeviin kysymyksiin mahdollisimman tarkasti

Sukupuoli 1 =poika (50) 2 =tyttö (50)
Koulu _____
Luokka (myös rinnakkaisluokka: esim 9 A) _____
Liikuntanumero (viimeinen todistus) 4 5 6 7 8 9 10
1 3 14 40 34 8

1. Kuinka usein harrastat liikuntaa urheiluseurassa
- En koskaan 50
Harvemmin kuin kerran viikossa 12
Joka viikko 21
Melkein joka päivä 17
2. Kuinka usein harrastat liikuntaa koulun tai urheiluseuran ulkopuolella?
- En koskaan 4
Harvemmin kuin kerran viikossa 18
Joka viikko 43
Melkein joka päivä 36
3. Koulutuntien ulkopuolella: Kuinka monta tuntia viikossa tavallisesti harrastat liikuntaa vapaa-aikanasi niin, että hengästyt tai hikoilet?
- En yhtään 7
Noin puoli tuntia 15
Noin tunnin 18
Noin kaksi-kolme tuntia 26
Noin neljä-kuusi tuntia 19
Seitsemän tuntia tai enemmän 16

Liikuntatunneilla tunnen itseni onnistuneimmaksi silloin kun:

1 = täysin eri mieltä ... 5 = täysin samaa mieltä

- | | | | | | | |
|--|---|---|---|---|---|-----------------------|
| 1. Voitan toiset..... | 1 | 2 | 3 | 4 | 5 | |
| | | | | | | 11 18 15 38 19 |
| 2. Olen paras | 1 | 2 | 3 | 4 | 5 | |
| | | | | | | 18 16 20 27 19 |
| 3. Yritän kovasti..... | 1 | 2 | 3 | 4 | 5 | |
| | | | | | | 3 5 10 41 42 |
| 4. Huomaan todella kehittyväni..... | 1 | 2 | 3 | 4 | 5 | |
| | | | | | | 3 3 12 33 49 |
| 5. Pärjään paremmin kuin toiset | 1 | 2 | 3 | 4 | 5 | |
| | | | | | | 9 15 22 36 18 |
| 6. Näytän toisille olevani paras..... | 1 | 2 | 3 | 4 | 5 | |
| | | | | | | 21 21 31 17 12 |
| 7. Voitan vaikeudet | 1 | 2 | 3 | 4 | 5 | |
| | | | | | | 1 5 15 41 37 |
| 8. Onnistun sellaisessa, mitä en ole aikaisemmin osannut | 1 | 2 | 3 | 4 | 5 | |
| | | | | | | 2 4 10 30 54 |
| 9. Pärjään sellaisessa, jota toiset eivät osaa..... | 1 | 2 | 3 | 4 | 5 | |
| | | | | | | 7 13 21 36 23 |
| 10. Teen kaikkeni parhaan kykyni mukaan | 1 | 2 | 3 | 4 | 5 | |
| | | | | | | 2 6 14 36 42 |
| 11. Saavutan itselleni asettamani tavoitteen..... | 1 | 2 | 3 | 4 | 5 | |

			2	5	15	31	46
12. Olen selvästi toisia parempi.....	1		2	3	4	5	
			19	21	26	19	14

Tehtävääorientaatio –muuttuja = 3+4+7+8+10+11

Minäorientaatio –muuttuja = 1+2+5+6+9+12

Ympyröi seuraavista väittämistä yksi vaihtoehto, joka parhaiten vastaa sinun käsitystäsi:

1 = täysin eri mieltä ... 5 = täysin samaa mieltä

1. Osallistuisin liikuntatunneille, jos se olisi vapaaehtoista	1		2	3	4	5	
			9	9	14	24	44
2. Luulen, että 20 vuoden ikäisenä harrastan liikuntaa tai muuta urheilua	1		2	3	4	5	
			5	6	18	27	45
3. Haluaisin, että minulla olisi liikuntatunteja nykyistä enemmän.....	1		2	3	4	5	
			18	11	21	20	29

Intentio-muuttuja = 1+2+3

Ympyröi seuraavista väittämistä yksi vaihtoehto, joka parhaiten vastaa sinun käsitystäsi.

Syy miksi liikun...

1 = täysin eri mieltä ... 5 = täysin samaa mieltä

1. Mielihyvän takia jota saan jännittävistä kokemuksista.	1		2	3	4	5	
			11	15	28	33	13
2. Mielihyvän takia jota tunnen kun opin uusia asioita liikunnasta.	1		2	3	4	5	
			8	14	27	38	13
3. Minulla oli aikaisemmin hyviä syitä harrastaa, mutta nyt mietin pitäisikö minun enää jatkaa.	1		2	3	4	5	
			37	19	25	13	6
4. Mielihyvistä jota tunnen kun löydän uusia harjoittelutapoja.....	1		2	3	4	5	
			9	16	38	29	9
5. En tiedä enää: minulla on käsitys etten pysty menestymään liikunnassa.....	1		2	3	4	5	
			37	23	22	12	6
6. Koska se saa minulle tutut ihmiset arvostamaan minua	1		2	3	4	5	
			22	17	34	22	5
7. Koska mielestäni se on yksi parhaista tavoista tavata ihmisiä	1		2	3	4	5	
			13	19	28	30	10
8. Koska olen tyytyväinen kun opin jonkin vaikean harjoittelutekniikan.....	1		2	3	4	5	
			8	11	25	38	18
9. Koska on todella tarpeellista harrastaa liikuntaa jos haluaa pysyä kunnossa.	1		2	3	4	5	
			3	5	11	29	53
10. Etuoikeudesta olla urheilija	1		2	3	4	5	
			25	13	39	15	9

11. Koska se on yksi parhaista valitsemistani tavoista kehittää elämäni muita osa-alueita.....	1	2	3	4	5	8	14	35	33	10
12. Mielihyvistä jota saan kun parannan heikkoja kohtiani.....	1	2	3	4	5	5	9	21	48	18
13. Jännityksestä jota tunnen kun osallistun toimintaan	1	2	3	4	5	11	16	30	30	14
14. Koska minun täytyy harrastaa liikuntaa, jotta voin olla tyytyväinen itseeni.	1	2	3	4	5	16	17	24	31	13
15. Tyytyväisyydestä jota koen kun parannan kykyjäni.....	1	2	3	4	5	5	8	26	44	18
16. Koska ihmiset ympärilläni ajattelevat, että on tärkeää pysyä kunnossa	1	2	3	4	5	19	22	30	22	8
17. Koska se on hyvä tapa oppia paljon asioita jotka voivat olla hyödyllisiä elämän muillakin alueilla.....	1	2	3	4	5	8	12	27	39	15
18. Voimakkaiden tunteiden takia joita tunnen kun harrastan jotain mistä pidän	1	2	3	4	5	10	12	28	31	19
19. Se ei ole minulle enää selvää: En tunne, että paikkani on liikunnassa.	1	2	3	4	5	43	19	22	10	6
20. Mielihyvistä jota tunnen vaikean tehtävän suorittamisen jälkeen.....	1	2	3	4	5	6	11	27	37	21
21. Koska tuntuisi pahalta jos minulla ei olisi aikaa tehdä sitä.	1	2	3	4	5	13	16	32	27	12
22. Näyttääkseni muille kuinka hyvä olen liikunnassa	1	2	3	4	5	30	23	25	17	5
23. Mielihyvistä jota tunnen kun opin harjoittelutekniikan jota en ole aikaisemmin yrittänyt.	1	2	3	4	5	10	13	29	32	16
24. Koska se on yksi parhaista tavoista pitää suhteita yllä ystäväni kanssa.	1	2	3	4	5	20	21	28	25	7
25. Koska pidän tunteesta olla täysin syventynyt toimintaan.	1	2	3	4	5	12	20	34	25	10
26. Koska minun täytyy harrastaa liikuntaa säännöllisesti.	1	2	3	4	5	17	18	24	27	15
27. Mielihyvän tunteesta, jota uusien suoritusmenetelmien löytäminen aikaansaa	1	2	3	4	5	12	15	40	23	10
28. Mietin usein itseni: En pysty saavuttamaan tavoitteita joita olen asettanut itselleni.	1	2	3	4	5	24	25	30	15	6

Intrinsic motivation to know = 2+4+23+27

Intrinsic motivation to stimulate = 1+13+18+25

Intrinsic motivation to accomplish = 8+12+15+20

Identification = 7+11+17+24

Introjected regulation = 9+14+21+26

Intrinsic motivation = Mean (IM to know + Im to stimulate + IM to accomplish + Identification + Introjected regulation)

External regulation = 6+10+16+22

Amotivation = 3+5+19+28