

Article

Physical activity as an investment or consumption good – a mixed methods approach

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Summary

Studying individuals' motivation to engage in physical activity raises the question of whether physical activity is a consumption good (enjoyment) or an investment good (a health investment). The aims of the study were: (i) What kind of motivational background is it possible to identify for different forms of physical activity among adults, and (ii) Is there an association between different motivational factors and the form and amount of physical activity among adults. A mixed methods approach was applied using interviews ($n = 20$) and a questionnaire ($n = 156$). The qualitative data was analysed using content analysis. The quantitative data were analysed using factor and regression analysis. Among the interviewees, different types of motivation were found: 'enjoyment', 'health reasons' and 'mixed motivations', and from the quantitative data: (i) mixed motivation, a combination of enjoyment and investment, (ii) dislike of physical activity, (iii) social, (iv) goal focused, (v) appearance focused and (vi) exercising only within the comfort zone. Mixed-motivational background, with both enjoyment and investment in health, increased weekly physical activity hours significantly ($\beta = 1.733$; $p = 0.001$). Personal appearance-based motivation increased weekly muscle training ($\beta = 0.540$; $p = 0.000$) and brisk physical activity hours ($\beta = 0.651$; $p = 0.014$). Conducting such physical activity which provides enjoyment during the performance of the activity, increased weekly balance-focused exercise hours ($\beta = 0.224$; $p = 0.034$). People have different kind of motivational backgrounds for engaging in physical activity. Mixed motivational background, including enjoyment and investment in health, yielded more physical activity in hours than if the person had only one of these motivations.

Lay summary

Pairing physical activity with pleasant associations could be a direction for effective physical activity promotion. It is important to enable people to test different physical activity types in order to find the type of physical activity which gives them most joy and pleasure. If one is conducting physical activity purely as an investment in health, the amount of activity is less than when the activity is combined with enjoyment. Getting pleasure from physical activity should be the main target when we try to increase physical activity among people who have previously not enjoyed physical activity.

Keywords: physical activity, motivation, behavioural economics, health economics, investment good, consumption good, mixed methods

BACKGROUND

Various public health interventions have attempted to increase physical activity (PA). Some of them have focused on individual behaviour change, sometimes with multicomponent interventions at the workplace, whereas others have been population level interventions (Sallis, 2006; Owen, 2011; Laine, 2014;

Abu-Omar et al., 2017). In behavioural economics, PA promotion can be viewed from different perspectives, for example, motivation, preferences, type of good (consumption or investment good), time and risk preferences (e.g. Epstein, 1998; Cawley, 2004; Sallis, 2006; Zimmerman, 2009; van der Pol, 2017; Blaga et al., 2018; Dunton, 2018; Bartha and Bácsné Bába, 2021).

Behavioural economics, or behavioural choice theory, is a combination of learning, cognitive psychology, decision making and economics (Epstein, 1998). According to the Grossman model of health investment (1972) and the earlier work of Mushkin (1962) and Becker (1965), individuals are both consumers and producers of health. Later, this model was extended (Cawley, 2004) by adding PA as a major part of this health production model. Cawley's (2004) economic framework (SLOTH-model) assumes that people seek to maximize their utility, with limitations due to limitations of time, budgets and biology.

In neoclassical models, according to Cabane and Lechner (2015) two main issues lead to engagement in leisure time physical activity (LTPA): enjoyment of PA and sport, and the desire to remain healthy and fit. If an individual engages in sport and LTPA because s/he enjoys it, PA can be seen as a consumption good. A person just enjoys the utility, without any far-reaching goals. In the latter case, a person engages in LTPA because s/he wants to be sure that s/he will remain fit and healthy in the future. In this case LTPA can be seen as an intermediary (investment) good, because the person receives the utility of expected health, as an investment (Cabane and Lechner, 2015). In economic jargon, this can be translated as follows: If an individual enjoys PA, s/he receives utility during performance of the activity, i.e. utility in use or process utility. However, if an individual experiences pleasure after the activity, and the reason for PA performance is investment in health rather than enjoyment, then it can be called utility in anticipation or outcome utility (Cohen and Henderson, 1991). This issue of utility of the PA is interesting, because both beforementioned views can be motivational backgrounds for PA (Hagberg and Lindholm, 2010). Utility in use was discussed by Cohen (1984) and Cohen and Henderson (1991), who concluded that total (net) utility is the sum of both utility-in-use and utility-in-anticipation.

From PA as consumption good, it is easy to move to the topic of motivation, and especially extrinsic and intrinsic motivation. Perhaps the phrase that best describes intrinsic motivation for PA is: 'performing PA for enjoyment'. In its most intense form, intrinsic motivation turns into passion (Vallerand, 2008). According to Vallerand (2008), the main difference between extrinsic motivation and passion is lack of enjoyment of the activity. If people enjoy being active, or their experience of PA is paired with pleasant associations, it is more likely that they will continue to be active (Epstein, 1998; Ball et al., 2014).

According to Leonard and Shuval (2017), the decision to be physically active has two starting points in the view of behavioural economics: (i) the individual must make judgements related to risk and uncertainty

(regarding the future benefits); (ii) PA decisions are time-related, so-called intertemporal choices, due to the fact that the costs and benefits occur at different points in time, sacrificing time now in exchange for future health benefits (see also Epstein, 1998). The following example illustrates this issue. If an individual's preferences are present-biased, this may cause the individual to value immediate costs and benefits over those which might occur in the future (O'Donoghue and Rabin, 1999). Usually, healthy behaviour is justified by benefits that will follow in the distant future. But if people are more present-oriented, they have more difficulties to commit to actions that may have positive health effects far into the future than individuals who are more future-oriented. Perhaps interventions with obvious short-term benefits would increase the adherence of those who are more present-oriented (van der Pol, 2017).

In health promotion, it is typical that the benefits often occur in the distant future, whereas the costs occur immediately. This may cause the following chain-reaction; the individual neglects efforts to exercise (regular PA), which would have short-term costs (e.g. going to the gym instead of lying on the sofa) but benefits which would occur in the future (preventing obesity or other health-related issues) (Sen and Frank, 2017). According to Strathman et al. (1994), present-oriented people tend to focus on outcomes which occur soon, whereas future-oriented people place more value on future consequences. According to a more recent study, time orientation played an important role in adherence to PA advice, but risk preferences were not associated with adherence (Van der Pol, 2017).

According to one recently published review, the most common motivation factors were health benefits, well-being, enjoyment, social interaction and social support (Pedersen et al., 2021). A study comparing motivations for sport participation versus exercise among college students in the US revealed that there were differences in participants' motivation to engage in sport compared to the motivation to engage in exercise. The motives for sport participation included competition, affiliation and enjoyment, whereas for exercise behaviour the motives were more health- and appearance-related (Kilpatrick et al., 2005). The motivational reasons for PA are complex. By using a mixed methods approach consisting of a quantitative survey and qualitative interviews, our purpose was to increase understanding of the motivational backgrounds of PA. The aim of this study was trying to identify, different kind of motivational background for different forms of PA through interviews and surveys and to explore if there is an association between different motivational backgrounds and the type and amount of PA?

The specified research questions of this study were:

- (1) What kind of motivational background is possible to identify for different forms of PA among adults?
- (2) Is there an association between different motivational backgrounds and the type and amount of PA among adults?

This study reduces the gap between PA promotion done by public health/health scientists and behavioural economics and demonstrates the potential of behavioural economics in PA promotion.

DATA AND METHODS

Project

This data originates from the project ‘Productivity by improving well-being’, a multicomponent lifestyle coaching project aiming to increase the well-being of participants in the East Savo Hospital District Joint Municipal Authority, Finland, during the years 2019–2021. In the project, individuals in work communities were recruited to an employee’s lifestyle coaching project. The promotion of well-being was mainly based on PA. In addition, the information sessions provided tips and ideas on reduced sitting, healthy eating, eating rhythms, sleeping, etc. The project target group were (i) people of working age (18–64), and (ii) work communities of public and 3rd sector employees and entrepreneurs and employees of micro-enterprises.

The central idea of this project was following. At the beginning of the intervention, the intervention participants were offered the opportunity to find out about their own health level and physical fitness. This was done with four objective measurements: The body composition, waist, resting pulse and grip strength and hand function measurements. The participants were told that the measurements will take place in 6 months again. As the promotion of PA was the heart of the intervention, it received the most attention. The project offered an option to use smart watches during the first four weeks of the interventions and a wellness application was introduced in all work communities. The reason for using the work community wellness application was to connect employees. Use of this application enabled peer support and got people to encourage each other in healthy activities. The support of the application was important, especially at the beginning of the intervention. Every work community had its own group in the application where they could record, save and share their own PAs and peer support each other. In addition, the project coordinator visited work communities regularly. He organized briefings on PA,

nutrition, sleeping, etc. and encouraged participants to be more active with different challenges, such as ‘let’s walk to Paris collectively during the next 4 weeks’, which meant almost 3000 km for the whole work-community, and for each member of that group ($n = 20$) an average of 150 km during the 4-week period. This motivated them, and everyone was able to participate in the challenge by doing some PA because every step was calculated. The COVID-19 transferred the practices online, and the project coordinator contacted the work communities through Teams application.

Participants of the intervention

Recruitment of project participants took place mainly through social media, intranets and project manager networks. Altogether 14 work communities and their 263 employees started in the intervention, while 84 employees in 7 work communities participated in the project as a control group. The work communities represented the following different sectors: social and health care, financial administration, banking, education, sanitation and food services.

The number of participants who participated in different measurements and surveys are presented in the flow chart in [Figure 1](#). The quantitative data originates from the six-month follow-up questionnaire. Altogether 156 respondents participated in the follow-up survey, 109 in the intervention group and 47 in the control group. All 156 respondents answered the PA questions but only 138 of them answered the PA motivation questions. The results of the main intervention were published earlier ([Kuvaja-Köllner and Kautonen, 2021](#)).

The questions about PA motivation were only asked in the six-month follow-up questionnaire and as part of the interviews. The description of the study population will be based on these 156 respondents and the results of the analysis of the 138 participants who answered both the PA hours and motivational questions.

Multiphase (see [Figure 1](#)) and convergent parallel mixed methods approach was used for data collection. The data collection strategy was based on the design of the intervention because as a development project, we needed to gather information during the intervention if the intervention works or not. To get this information, we interviewed participants from the work communities that first initiated the intervention. The data for qualitative (Qual) and quantitative (Quan) purposes were gathered at the same time, at 6-month follow-ups. For the analysis, we used exploratory sequential strategy, which means that we utilized the results of the interviews (Qual) in selecting a factor analysis (Quan) method. The idea of this strategy was to test if data from interviews with a few individuals can be generalized to a larger sample of a population.

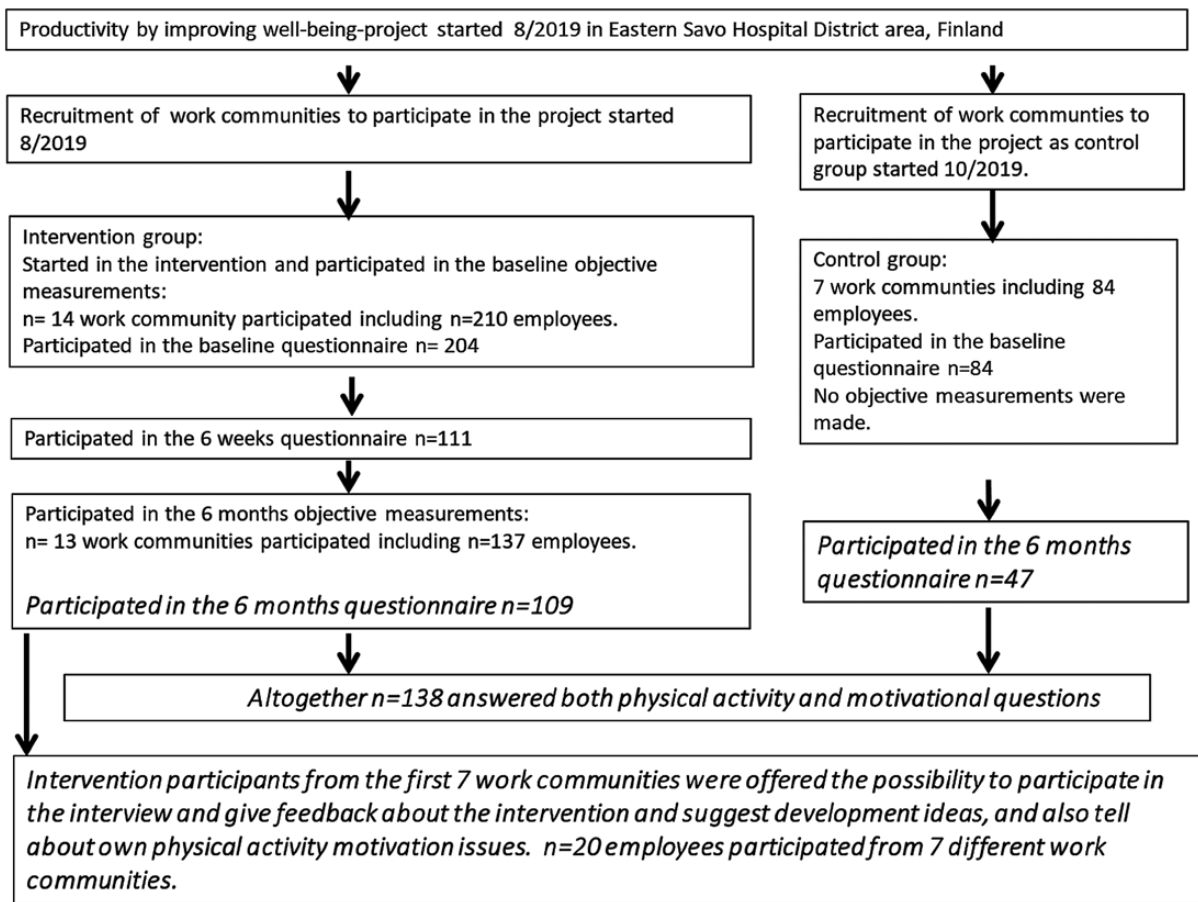


Fig. 1: Flow chart of the study participants and data formation interviews.

(Cresswell, 2014, p. 276). Thus, at the end of the analysis, the results of both data were compared with each other.

The data included in this study are shown in Figure 1 with different types and bigger sizes of fonts.

At the 6-month objective measurement event, participants were told about the possibility to give feedback about the intervention and sharing their own PA motivational backgrounds by participating in the interviews. The main idea of the interviews was to enable the organizers to make changes and developments in the intervention, if necessary. The secondary aim was to acquire more understanding of motivational backgrounds for PA. The voluntary participants for interviews signed up to the project manager, who gave their e-mail addresses to the researcher. The items of the questions were sent to the participants for interviews beforehand via e-mails and the information about the recording of the interviews was also given beforehand.

The interviews included open- and closed-end and semi-structured questions. They were performed online

(due to COVID-19 precautions) using a smartphone, which enabled recording. At the beginning of the interview, each participant gave informed consent to participate in the interview.

The intervention-related questions were generally such as: Did you need a lifestyle change? Did you manage to make the change? What did you change in your lifestyle? Why did your lifestyle change succeed or fail? What helped in success? Would you have needed more support, and what kind of support? The answers to these questions have already been published in Finnish (Kuvaja-Köllner and Kautonen, 2021).

The topic of this article was the type of PA and motivational background for PA-related questions. In most of the cases, before the following key questions were asked, the interviewees had already talked about their own relationship with PA in rich and fruitful ways and the interviewer had already developed an understanding of the interviewee's PAs and sports. At this point, it was only clarified what was the interviewee's favourite PA and the associated motivational background. Thus,

the data used for this study were accumulated throughout the interview. The expressions describing the feelings and the motivational backgrounds related to PA that emerged during the interview were used for content analysis and for citations. The specific PA motivation questions were the followings: The interview questions analysed were: What is your favourite PA/sport? What is your motivational background for this PA/sport? There were eight reply options: (i) It is fun. (ii) Its social nature. (iii) Its health impacts. (iv) Desire to participate in competitions. (v) Spouse/friends are also doing this. (vi) Habit, my lifestyle. (vii) For my mental health. (viii) Something else _____. These eight options were read to the respondent and repeated for each of the interviewee's reported sport activities.

Altogether 20 participants from first seven work communities signed up for interviews via the project manager. The mean age of this group was 49.15 (SD 10.47), the youngest 25 and the oldest 62. Thirteen of the 20 interviewed were women. The mean interview duration was 37 min, the shortest 25 and the longest 58 min. The interviews were transcribed, and content-based analysis of the data was conducted using ATLAS.ti 9, a qualitative data analysis software. The average number of words was 4243 (Finnish), minimum 2462 and maximum 6869. However, only 10–20% of each interview was used for this article, meaning on average <7 min and 400–800 words.

The data was analysed using content analysis (e.g. [Elo and Kyngäs, 2008](#)) and the role of these specific PA motivational questions asked at the end of the interview just confirmed the discussion done during the whole interview. First, there was open coding. Then the list of motivational background categories was grouped into five groups: health, enjoyment, mental health, habit and social interaction. These groups were reduced in the abstraction process to three groups based on the idea of PA as a consumption (enjoyment) or investment good (investment in health) or mixture of these two. For example, the categorized mental health codes were merged according to the mode of expression. If it was closer to a good mood immediately after PA, it was merged into the enjoyment group. If the expression was more like 'walking to work increases my stress tolerance', the reply was merged to the health group. Habit impression was merged according to the same idea. If the habit impression was more like 'I'm addicted to running', it was merged with the enjoyment group. If the expression was more like 'I need to get fresh air and go for walk to be able to do my work', then the reply was merged with the health group. If both expressions were used, the response was merged into the mixed motivation group. Social interaction was also merged to the mixed motivation group. If a person's motivational background for all

PA hobbies was associated with enjoyment, the person was assigned to the enjoyment group, where PA was considered as a consumption good. If the motivational background for all PA hobbies was always according to the respondent's health expectations, the respondent was assigned to the health investment group, where PA was considered as an investment good. If a respondent expressed different motivational backgrounds for different kinds of PA, s/he was assigned to the mixed motivational background group for PA. Three groups, corresponding to the theory of PA as a consumption or investment good or as a mixture of the two, are presented in [Supplementary File 1, Figure 1](#). Although interviewing, spelling, coding, analysis and interpretation of results were largely the responsibility of the first author (VKK), these were discussed thoroughly with the research team.

Survey

The survey data were collected via electronic questionnaire and a link to the questionnaire was sent to participants via e-mail. The questions assessing the regularity and type of PA were taken from [Health \(2011\)](#), a Survey on Health and Functional Capacity in Finland ([Health, 2011](#)). How physically active are you during the week? Consider all regular weekly PA lasting at least 10 min per session, frequency per week, duration in hours and minutes. The types of PA and a detailed description of the questions is presented in [Supplementary File 2](#).

In the respondents' data, the minutes were transformed into hours, which were summed up for each type of PA and then for all five PA types together to represent all weekly PA hours.

The motivational background for PA was explored using statements and offering a five-point Likert scale. The statements ($n = 20$) were gathered from many different sources and were invented for this survey. On a general level, the statements attempted to catch enjoyment, health and social aspects, but also a dislike of exercise and sport. The statements are presented in the results section, [Table 2](#).

Statistical analyses

A factor analysis was conducted, the factor scores were saved using IBM SPSS Statistics 27 (IBM Inc., Armonk, NY, USA), and the PA association with the factor scores was analysed by linear regression and seemingly unrelated regression using STATA IC15.

We used factor analysis ([UCLA, 2021](#)) because we wanted to reduce the 20 motivational variables into fewer numbers of underlying factors. The decision to use factor analysis was also based on the idea that after transcription of interviews and conducting the content analysis, we already had clues about what types of

motivational dimensions to expect. The decision about the exact factor methods was based on the relatively low number of participants and consistency with the results of the interviews, so the PA motivations were identified by running Kaiser alpha factoring analysis. Model testing proceeded as follows: (i) examination of the Kaiser–Meyer–Olkin (KMO) measure to determine sampling adequacy for factor analysis; (ii) computation and analysis of the 20-item correlation matrix; (iii) factor analyses including orthogonal rotation for the resultant factor structure by Varimax with the Kaiser normalization procedure; and (iv) inspection of eigenvalues, scree plots and percent of total explained variance with each analysis of rotated factor matrix to determine the optimal number of factors. For easy interpretation and to name the factors, the orthogonal rotation technique varimax was used, which does not allow correlation between factors. Item loading values above 0.3 were taken into consideration for factor allocation, and factor scores were saved for further analysis.

Linear regression was performed to assess the associations between one dependent variable, all different kinds of weekly PA hours (where all weekly PA hours were summed up), and six motivational factors. The model was tested for its multicollinearity, heteroscedasticity and regression specification error.

For the four more specific PA variables, we used seemingly unrelated regression (SUR). The SUR-model takes into account whether the error terms are correlated, as could be the case with different kinds of PA. The SUR model provides more robust parameter estimates of coefficients, standard errors and covariance. The options for small-sample statistics and their adjustment were used. The model was tested for correlation of the residuals with the Breusch–Pagan test, and all factors were tested for their statistical significance as explanatory variables in the SUR regression. Significance was achieved when the p -value was ≤ 0.05 .

RESULTS

Results of the interviews

The interview results illustrated that the motivational backgrounds varied between different people, and an individual can have different kinds of motivational backgrounds for different types of PA. Three different groups were identified among the interviewees: enjoyment of PA; investment in health and a combination of the two, as a mixed group.

Most of the interviewed people had mixed motivational backgrounds for PA. Interviewees with mixed motivational backgrounds stressed that they had at least two different PA hobbies, some had as many as five. They usually had one favourite PA type, such as

walking, running, dancing, etc. However, they also conducted muscle fitness training, even though they did not enjoy this *per se* but did so because they thought it would be beneficial to them in the long run. Whereas the ‘enjoyment group’ indulged in exercise solely because it was so pleasurable. The group ‘Investing in health’ included those who exercised to maintain their ability to function.

Those whose motivational background for PA was enjoyment of PA expressed that they experienced pleasure during exercise, using descriptors such ‘fun’ and ‘enjoyable’.

Person_t36, enjoys cycling: *‘I get a sense of flow from cycling just at the very moment when I’m doing it. I always try to cycle longer and faster, and I always check it from the speedometer, which has a lot of self-challenges and self-defeating and makes it fun.’*

In the case of people who strongly verbalized motivation to exercise with words related to health and functional capacity, their motivation to exercise sounded like an investment in their own health. They expressed themselves with the following phrase.

Person_t29, enjoys walking: *‘The health issue is the main thing. To get some fresh air, when I’m walking outdoors. I take care of work-related stress, but I guess fat burning is the most important. I’m in that age when fighting against one’s own age is impossible. To maintain one’s ability to function.’*

Most of the interviewees had more than one PA hobbies. They had at least one favourite type of PA, which they often practiced, and which yielded enjoyment, utility in use. But they also had another sport, which they practiced as an investment in health, e.g. muscle fitness training.

Person_t31, primary PA, dancing: *‘It is such fun. I really enjoy it; it is my very own time.’*

The same person_t31 said: *‘Sometimes I do some muscle training at home, such as exercises for abdominal muscles. But I don’t enjoy them at all, so I do them quite rarely because I’m not motivated.’*

And as already mentioned, one of the interviewees did not feel that he was doing any exercise *per se* but was an everyday exerciser, for example chopping firewood during his free time.

RESULTS OF THE SURVEY

A description of the participants of the 6-month quantitative data is presented in Table 1. The mean age of participants was 49 years, youngest 24 and oldest 63.

A minimum acceptable score for this KMO test is 0.5; our data yielded 0.717. Our data, with alpha factoring analysis, yielded six factors with eigenvalues >1 . The number of factors was not limited *a priori*. Altogether, these six factors explained 60% of the variance. Factor

Table 1: Description of 6-month data

	<i>n</i> = 156	SD
Intervention	70%	
Control	30%	
Female	71%	
Male	12%	
Missing	17%	
Mean age	49	SD 9.15
Physical activity variables PA/hours/ week/person	Mean	SD
Slow, easy exercise	3.22	3.530
Brisk physical activity	2.90	2.478
Vigorous and strenuous aerobic exercise	0.83	1.271
Muscle-strengthening physical activity (neuromuscular training such as fitness, resistance training, etc.)	0.76	1.123
Balance training (dance, karate, etc.)	0.49	0.930
All physical activity	8.20	5.346

1 contained items reflecting enjoyment of PA but also of staying fit, seeing PA as a health investment. Due to this combination of both views, enjoyment and investment, this factor was called mixed PA motivation. Factor 2 represented opinions illustrating dislike of PA. Factor 3 obviously represented opinions reflecting PA as part of respondents' social network and life, being together with friends. Factor 4 captured opinions of respondents who had clear goals for their exercise, e.g. participating in competitions. Factor 5 included items, such as which could be included under title 'Appearance'. Factor 6 contained opinions from people going for walks with the dog and performing only PA and sports which increased their subjective well-being and good mood (comfort zone) during the PA performance itself. The composition and names of the rotated factors are shown in Table 2.

In the linear regression, all different PA types and their weekly PA hours were summed together. The mixed motivational backgrounds, with both enjoyment and an interest in health investment, increased PA significantly ($\beta = 1.733$; $p = 0.001$). The adjusted *R* square was 11%; *R* square was 15% (Table 3).

The results of the SUR-model showed that in three of four equations, the mixed motivational background for PA was significant in increasing weekly PA hours. Only in the case of balance training mixed motivational backgrounds did not have any correlation.

Individuals with a strong appearance orientation conducted more neuromuscular training hours/week (fitness, resistance training, etc.) than individuals

with other motivational backgrounds for PA ($p = 0.000$), and the appearance motivation also increased brisk PA ($p = 0.014$). If the individual was goal-oriented, weekly PA hours in vigorous and strenuous aerobic-type PA increased ($p = 0.002$). Individuals whose exercising was based on the enjoyment of the moment performed more balance-based exercising ($p = 0.034$) than people with other motivation backgrounds. Dog walkers were also in this same group. *R*-square varied in the models between 12.4% and 20.9% (Table 3). The results of slow, easy exercise/PA variable are not presented here because there were no significant motivational factors. But this slow, easy exercise/PA variable was included in linear regression, where all weekly PA hours of different types of PA were summed up.

DISCUSSION

The research questions were: (i) What kind of motivational background is possible to identify for different forms of PA among adults? (ii) Is there an association between different motivational backgrounds and the type and amount of PA among adults?

The results of both data confirmed that the motivational backgrounds varied between interviewed people and that an individual can have different kinds of motivational backgrounds for different types of PA. Most of the interviewed people had mixed motivational backgrounds for PA. They had one favourite PA, such as walking, running, dancing, etc., and according to the behavioural economics wording they obtained the utility during performance of the activity, which is called utility in use or process utility. Individuals with mixed motivational background for PA also took part in PA which was not their favourite type. In most cases, these additional, less enjoyed PA hobbies were muscle and resistance training. The respondents did these exercises because they knew they were for them in the long run. They were aware that they were making an 'investment' in their own health. Only three of the interviewees said that all the PA they conducted was based on the idea that it was done for health reasons. For these people, PA can be seen as a pure investment good. Three other interviewees said that they did their PA hobbies only for the enjoyment that comes with it. In this case, PA was purely a consumption good.

Different kinds of motivational backgrounds for PA were also found in the quantitative data. Altogether six factors were found: (i) mixed PA motivation, (ii) dislikes PA, (iii) likes PA and exercising due to its social nature; (vi) goal-oriented movers; (v) motivated by personal appearance; and (vi) individuals who only do such exercise and PA which they enjoy at the moment.

Table 2: Rotated factor matrix for physical activity motivations and variable loadings

	F 1. Mixed motivational background	F 2. Dislike physical activity, exercise, and sport	F 3. Like physical activity and exercising due its social nature	F 4. Goal-focused movers	F 5. Appearance-oriented movers	F 6. All PA in the comfort zone. Dog walkers
I exercise in order to be in good shape at retirement age.	0.698					
I exercise to keep my ability to function well and to be able to do my job.	0.640					
I enjoy physical activity	0.614					
Physical activity/exercise has positive effects on my mood	0.565					
Exercise doesn't bring me any pleasure; I enjoy other hobbies more	-0.551	0.300				
I'm in poor shape, so starting an exercise hobby is challenging for me, and that's why I don't do it either.	-0.424	0.600				
Exercise has never been important to me.	-0.317	0.574				
I am overweight but that's my own business, so I can't be forced to move.		0.529				
School PE classes left me with an aversion to exercise.		0.429				
The company of friends is important when exercising.			0.702			
Group exercises are important to me because of their social nature.			0.677			
Exercising with my spouse / family is important to me.			0.453			
Using a sports watch, etc., and a related app supports my movement.				0.636		
I set myself realistic goals in exercise.				0.534		
I set goals for myself in exercise hobbies (competitions), and they motivate me in training.				0.477		
I exercise mainly for weight management.					0.549	0.303
It's important to me that I look good and that's why I move.					0.548	
Some of my workouts are very heavy and I don't enjoy doing them at all, but I think they will benefit me in the long run.					0.514	
The dog moves me.						0.533
I only do exercises that are fun and comfortable						0.511

Table 3: The motivational factors and their impact on different types of physical activity

	Seemingly unrelated regression				Linear regression
	Brisk physical activity hours/week	Vigorous and strenuous aerobic exercise hours/week	Neuromuscular training hours/ week (such as fitness, resistance training, etc.)	Balance training hours/week (such as dance, karate, etc.)	All physical activity hours/week
F1: Mixed motivational backgrounds: enjoyment and health	0.549* 0.018	0.309* 0.013	0.289* 0.010	0.137	1.734** 0.001
F2: Dislikes physical activity, exercise and sport	-0.174	-0.236	-0.015	-0.165	-0.477
F3: Likes physical activity and exercising due its social nature	0.057	0.063	0.204	0.169	0.351
F4: Goal-oriented movers	-0.010	0.432** 0.002	0.055	0.185	0.750
F5: Appearance-orientated	0.651* 0.014	-0.045	0.540*** 0.000	-0.041	0.564
F6: All PA in the comfort zone, dog walker	0.465	-0.134	-0.238	0.224* 0.034	1.002
Constant	2.977***	0.906***	0.873***	0.471***	8.486***
Observations	138	138	138	138	138
F-Stat	3.08	4.07	5.77	3.16	3.82
Sig	0.0055	0.0005	0.000	0.0047	0.0009
R-square	12.4%	15.7%	20.9%	12.7%	14.9%
RMSE	2.306	1.233	1.117	0.882	5.064

* $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$.

The factor analysis and regression analysis confirmed the interview results, but they also yielded more interesting information. According to our results, the mixed PA motivation significantly increased all other PA types except balance training, such as dancing. The individuals with goal-oriented PA did significantly more vigorous and strenuous aerobic-type exercise. The result that appearance-oriented respondents conducted significantly more muscle and resistance training are quite logical. The factor number six, 'comfort zone', summarizes well the comments made about dancing, and especially Zumba dancing, in the interviews: 'Forget yourself and let the music move you.' The individuals with 'PA in the comfort Zone' conducted more balance training PA than those with other kinds of motivational backgrounds for PA. Summing up these different kinds of PA types indicated that this mixed motivation for PA was the best motivational background for PA generally: a combination of some nice, favourite PA with some less enjoyable but beneficial PA to invest in one's own future health capital.

As the results of the study showed, the use of behavioural economics in PA promotion could be useful and bring added value to this research area. Until now it has got much too less attention in health promotion (Luoto and Carman, 2014; Sen and Frank, 2017). If this mixed motivational background is the way to increase individuals' PA levels, then there is need to increase the supply of different kinds of PA. All-aged people should be encouraged to test different kinds of PA, to find their own PA type. Finding enjoyment in PA can lead to a more physically active lifestyle, and later these people might be able to do some additional PA, which although less enjoyable, would be seen as an investment in their own health, well-being and future functionality.

Returning to the title of this article: is PA an investment or a consumption good? We found examples of both types of people, but there is no need to try to categorize all other motivational backgrounds to either one of these groups. The result of this study supports the results of a recently published review (Pedersen et al., 2021) where the most common motivation factors

were health benefits, well-being, enjoyment, social interaction and social support (Pedersen et al., 2021). The results of this study also confirm the conclusion drawn among behavioural economists that behavioural economics and public health researchers can only benefit from each other when designing PA interventions (Cawley, 2004; Blaga et al., 2018; Dunton, 2018).

Limitations and strengths of the study

This study has some limitations. There may have been a selection bias, and individuals who participated, as intervention or as control group participants, may differ from those who declined participation. It is possible that the sample who participated in the intervention, and in the baseline and 6-month follow-up measurement, were only those subjects who were especially motivated for lifestyle change. Due to the selection bias and differences in these motivational backgrounds, it is possible that we are missing some valuable information about motivational backgrounds from those who felt so much discomfort with PA that they did not want to participate in the study. There are also limitations relating to the generalizability of the results. The sample size was too small to generalize the results. The qualitative data were analysed by the first author. However, the validity of the results was tested by discussing the findings and interpretations made by the first author in the research group.

The strength of this study was the applying mixed methods approach. Combining the qualitative and quantitative data helped to answer the complex questions about PA motivations.

CONCLUSION

The results of this study confirm the idea that pairing PA with pleasant associations could be a strategy for effective PA promotion. It is important to enable people to test different kinds of PA hobbies, to find the PA type which gives them most enjoyment. After that, the increase in PA performed is easier to realize. To get joy, enjoyment and pleasure from PA should be the main target when we try to increase PA among people who have never liked PA.

Supplementary Material

Supplementary material is available at *Health Promotion International* online.

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Ethical Approval

We did not request an ethical review statement from a human sciences ethics committee, because our research did not contain elements requiring ethical review. All participants gave their informed consent to participate.

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