

## 4. *Becoming physically active*

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### *Introduction*

Regular physical activity increasing health and well-being for the individual and saving society considerable cost are known facts today. It is estimated that the cost resulting from insufficient physical activity amounts to approximately SEK 6 billion per year (1). Efforts are being pursued in society as a whole and in schools to increase the level of physical activity (2).

Many are aware of the benefit of physical activity and recommend regular physical activity, but are nonetheless passive in their daily lives. The research that concerns going from being physically passive to being active show that this process is more difficult than what can initially be believed. Behavioural change is a difficult process to grasp in many regards (3–6).

With the recommendations for physical activity that exist today (a minimum of 30 minutes a day) (7), a majority of the adult population is inactive (8). Inactivity results in a lack of energy and excess weight. Daily life also places increasingly fewer demands on natural physical activity. We can change tyres on the car at a garage. We can take the lift instead of stairs, etc. The excess weight sneaks in and, consequently, the weight gain is not as striking – circumstances “cushion” a loss of energy and weight gain.

### *Physical activity in a time perspective*

In a study from Västerbotten, a health follow-up has long taken place among persons who turn 40, 50 and 60 years old. The study is being carried out by the Västerbotten County Council and comprises diverse data, including a few questions regarding physical activity. As a part of the study, a follow-up was carried out of approximately 16,000 people after ten years (9, 10). See table 1.

**Table 1. Responses to the question of how often the person had exercised after first having changed into training clothes. The same question was answered by 16,000 people with ten years in between.**

First year Tenth year	Never	Now and then	1 time/week	2–3 times/ week	More than 3 times/week	Total
Never	4 022	933	503	354	112	6 004
Now and then	1 679	1 336	685	522	136	4 358
Once weekly	988	814	824	642	153	3 421
2–3 times/week	287	272	286	469	162	1 476
More than 3 times/week	133	111	88	169	171	672
Total	7 109	3 526	2 386	2 158	754	15 931

The questions asked in this context pertain to exercise where one changes into training clothes. It then turns out that virtually everyone is classed as physically inactive, and approximately 4,000 have never changed into training clothes, not even over a period of ten years.

## *Thoughts about changing lifestyles*

Riksbankens Jubileumsfond (Jubilee Fund of the Swedish Central Bank) carried out a conference 25 years ago with the title “Changing lifestyles”, which also became the title of a book published after the conference (11). At this conference, a number of researchers participated with various areas of interest, including antidotal smoking treatments, physical activity, diabetes follow-up, etc. The common message from these scientists was that it is difficult to change behaviour, regardless of which behaviour is in question.

## *Behavioural change models in the area of physical activity*

A number of models have been used and are currently used to try to understand, explain and change behaviour in various health-related areas (12). In the area of physical activity, the following theories and models have been used or are used in research on behavioural change: *Classic learning theories*, *Health belief model*, *Transtheoretical model*, *Relapse prevention*, *Social cognitive theory*, *Theory of planned behaviour*, *Social support* and *Ecological perspective* (7, 13). One example where various models are combined is the *Groningen Active Living Model* (GALM), which focuses on the elderly (14). The most common today are the *Transtheoretical model* and *Social cognitive theory*. It appears as if theory-based behavioural interventions increase physical activity. For example, improvements in physical activity can be seen in the state of ill-health, such as cardiovascular disease, when behavioural change programmes have been used in treatment. Furthermore, interventions that include lifestyle changes, or changes in multiple areas such as physical activity and diet, appear to increase physical activity (15).

## *Transtheoretical model*

One of the most popular and most used models to describe and change behaviour is the transtheoretical model. The transtheoretical model was developed, and refined, by the U.S. researchers Prochaska, DiClemente and Norcross at the beginning of the 1980s. Work on the model began with an analysis of theories that have been used for behavioural change in psychotherapy. The objective of the analysis was to harmonize the various theories with each other into a model. The transtheoretical model can therefore definitely be said to be *transtheoretical*, since it harmonizes behavioural change principles and approaches for change from a number of different intervention theories (5, 16).

After the work on harmonizing the various theories, it was investigated how often various approaches were used by people in for instance antidotal smoking treatments. Then it turned out that people use different approaches at different points in time in their efforts to stop smoking. Consequently, behavioural change is considered to occur by moving through different stages (5, 16).

Hence, the transtheoretical model had its origins in smoke cessation, but has also been used in other health-related areas, such as alcohol abuse, obesity and physical inactivity (5, 16). Although the transtheoretical model is not directly developed for the area of physical activity, its use appears to be promising in the area (17). The model's use also appears to be promising in work on physical activity in rehabilitation (18). A popular science and practically applicable example of the transtheoretical model tied to the area of physical activity is J. Faskunger's book *Motivation för motion* [Motivation for exercise] (6).

The transtheoretical model comprises several different components. One of the components is called the *stages of change* and contains various stages based on people's inclination for change, in other words where a person is in the behavioural change process. Another component is called the *processes of change*<sup>1</sup> and includes various approaches through which people move between various stages of change. The third component focuses on why people change and consists of activity-specific *self-efficacy* and motivation balance (5, 16). In working with behavioural change, it is important to use all of the components of the model to achieve a successful result, meaning to change a behaviour (17).

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1. Faskunger uses the term "process", but the interpretation made here is that the English word "process" rather entails a form of an approach.

## Stages of change

According to the transtheoretical model, behavioural change is seen as a process over time and there are six stages of change: *Precontemplation, contemplation, preparation, action, maintenance* and *termination* (5, 6, 16).

People who are not regularly physically active nor are interested in or intend to change their inactive behaviour are in the **precontemplation stage**. One reason they are in the precontemplation stage may be too little knowledge or information about the risks of being physically inactive. Another reason may be that they have tried to change their behaviour a number of times, but have failed and thereby lost faith in their ability to change. Regardless of reason, people in the precontemplation (or denial) stage avoid reading about, talking about and thinking about their risky inactive behaviour. They deny that physical inactivity is a problem for them (5, 6, 16).

People who are not regularly physically active, but who intend to change their inactive behaviour in the next six months are in the **contemplation stage**. They understand that physical inactivity is a problem for them and honestly contemplate how to go about becoming physically active. However, some people do not make it any farther, but rather get stuck at the contemplation stage for a prolonged period. They become “chronic contemplators”. People at this stage are not ready for traditional activity-oriented interventions where the participant is expected to become active immediately (5, 6, 16).

People who are not regularly physically active, but have plans of becoming physically active in the near future, most often within one month, are in the **preparation stage**. Usually, people in the preparation stage have tried some form of physical activity in the past year and also have a concrete plan for implementation. For people in the preparation stage, activity-oriented interventions are suitable since they are ready to become physically active (5, 6, 16).

People who are regularly physically active and have been so for six months are in the **action stage**. Changes in the action stage are more visible to the surroundings than in the other stages of change. It is therefore easy to believe that people in the action stage have achieved a change in behaviour, but the action stage should only be considered a part of the behavioural change process. Regular physically active behaviour requires time to be established (5, 6, 16).

People who are regularly physically active and have been so for more than six months are in the **maintenance stage**. As in the other stages, there are also challenges in the maintenance stage. People in the maintenance stage should focus on the work of consolidating and strengthening the gains of being physically active, based on lessons from the other stages of change. They should also work on preventing relapse (5, 6, 16). People who have fully assumed a behaviour are in the **termination stage**. They have full faith in their

behaviour and that they will not return to their previous behaviour, regardless of the situation. Behaviour takes place out of habit and automatically (5, 6, 16). One example is that one puts on the seat belt without thinking about it when getting into the car (19). The termination stage has been debated. It may be so that the termination stage is too strict and the realistic goal for areas such as physical activity is to be in a lifelong maintenance stage (5, 16, 20). The termination stage could possibly be associated with the areas of everyday exercise, such as always spontaneously choosing to take the stairs instead of the lift.

The behavioural change process should not be seen as a linear process, but rather as spiral shaped. The shift between the stages can take place both forwards and backwards. Relapses should be viewed as a natural part of the process. It is therefore important to work with relapse prevention so that the relapses do not become more than sidesteps. People often need to go through both success and setbacks to succeed in making a change (5, 16).

In working with behavioural change, it is important to know the stage of change that people are in so that the efforts agree with people’s receptivity. If efforts and stages of change do not agree, the number who drop out may increase. In the area of physical activity, it can be easy to think about activity-oriented interventions as an opportunity for behavioural change. However, succeeding with activity-oriented interventions presuppose that people are in the preparatory stage or further. However, this does not appear to be the case. A majority appear instead to be in the earlier stages of change of the precontemplative and contemplative stages (5, 16, 21).

To obtain information about which stage of change people are in, the following statements, presented in table 2, can be used (5).

**Table 2. Statements that can be used to gather information about which stage of change a person is in.**

	Precon- templation	Contemp- lation	Preparation	Action	Maintenance
1. I am regularly physically active and have been so for more than six months.	No	No	No	No	Yes
2. I am regularly physically active and have been so for six months.	No	No	No	Yes	
3. I am not regularly physically active, but I have plans of becoming physically active in the near future; within one month.	No	No	Yes		
4. I am not regularly physically active, but I intend to change my physically inactive behaviour in the next six months.	No	Yes			

If the answer is no to all of the statements, the person is in the precontemplative stage. If the answer is no to the first three statements and yes to the last, the person is in the contemplative stage. If the answer is no to the first two statements and yes to the third, the person is in the

preparatory stage. If the answer is no to the first statement and yes to the second, the person is in the action stage. Lastly, if the answer is yes to the first statement, the person is in the maintenance stage (5). A yes to the first statement could also mean that the person is in the termination stage.

## *Processes of change*

Activities or processes that people use in the respective stages of change to move to another stage can provide guidelines for interventions, in other words they can be a good guide for the person changing behaviour. There are ten processes that have proven to have the strongest empirical support. The following five approaches can be viewed as experiential or contemplative: *consciousness raising*, *dramatic relief*, *environmental re-evaluation*, *self re-evaluation* and *social liberation*, and the following five can be viewed as behaviourally or activity oriented: *counter-conditioning*, *helping relationships*, *reinforcement management*, *self-liberation* and *stimulus control* (5, 6, 16).

**Consciousness raising** involves seek new knowledge and information about physical activity.

**Dramatic relief** involves negative feelings associated with physical inactivity, such as breathlessness and excess weight. The negative feelings can decrease and can even become positive when the physical activity increases in scope.

**Environmental re-evaluation** involves re-evaluating how physical activity and physical inactivity affect one's surroundings. This can include the person's assessment of how a physically inactive lifestyle affects family and friends.

**Self re-evaluation** involves intellectually and emotionally re-evaluating the value of physical activity to one personally; for example, physical activity makes me stronger and more energetic.

**Social liberation** includes becoming aware, accepting and finding possible alternatives for physical activity in society, including everyday exercise.

**Counter-conditioning** involves handling situations that entail everyday physical inactivity. One example is taking the stairs instead of the lift.

**Helping relationships** involve getting help from others to be able to increase the physically active behaviour.

**Reinforcement management** involves changing physically inactive behaviour by rewarding physically active behaviour.

**Self-liberation** involves believing in, choosing and committing to greater physical activity, in other words feeling that one will manage to be regularly physically active.

**Stimulus control** involves taking control over the situations and causes that lead to physical inactivity, such as avoiding situations involving a great deal of sitting still.

Different processes of change are used in the different stages of change. Based on the empirical evidence, it is appropriate in the first stages of change to use cognitive, emotional and self-evaluation approaches to move forward in the stages of change. In the later stages, it appears as if people use more self-liberation, counter-conditioning, reinforcement management, stimulus control and helping relationships to move to the maintenance or termination stages. To succeed in a behavioural change, it is important to use the right process of change at the right time, in other words at the right stage of change (5, 16).

The processes of change should not be confused with techniques for behavioural change. The various processes can include many strategies or techniques to achieve change and these can also vary between people (5). For example, techniques that are used in the reinforcement management change process vary. One person rewards himself with some time in the sauna at one of three completed physical activity sessions a week. Another rewards herself with cinema tickets after a month of regular physical activity. The sauna and cinema tickets can be said to constitute different techniques for the reinforcement management process.

## *Intervening processes*

The processes of change that were touched upon above have ties to certain intervening variables, including decisional balance and self-efficacy. The latter are the actual drive or the engine that means that a shift from one stage of change to another takes place through various processes of change. These intervening processes can be viewed as a type of spiral that moves between a certain stage or certain process, and then on to the next stage and (in part) other approaches and constantly drives the change forward, although with some relapses at times. *Decisional balance* reflects a person's inclination to change based on personal advantages and disadvantages of the new behaviour. It appears as if it is more important to work on increasing the advantages than on reducing the disadvantages (5, 16).

The concept of *self-efficacy* comes from social cognitive theory (22). To describe the concept of self-efficacy in Swedish, situation or activity-specific self-confidence or self-esteem is used, in other words faith in one's own ability (6, 15). This is a type of self-confidence that people have with regard to their personal capacity of being able to handle various situations. Consequently, self-efficacy varies depending on the activity, situation and requirements of skills in a specific area (5, 6, 22). For example, the same person can have a strong faith in her ability to lead groups, but a weak faith in her ability to lose weight. Another example is that the same person can have a strong faith in his ability to be physically active when the sun is shining, but a weak faith in his ability to be physically active when it is raining.

People's self-efficacy can be positively developed through the following four areas. The first area concerns acquiring positive experiences. Succeeding leads to a stronger faith in one's own ability. The second area concerns being surrounded by positive role models. Seeing other people overcome similar problems strengthens confidence in one's own ability. The third area concerns acquiring support from the surroundings. Positive and realistic feedback can strengthen self-efficacy. The fourth area concerns focusing on positive emotional and physical states. In the area of physical activity, it is important to keep in mind that the activity itself can generate negative feelings, such as fatigue, aches and pains. Being able to handle these negative feelings requires a high level of self-efficacy (22). It has been shown that self-efficacy plays a significant role in behavioural change in the area of physical activity (15).

## *Establishing regular exercise habits*

### *The study*

A dissertation by Wester-Wedman (3, 4) presents the results of a project in which 44 physically inactive persons, equal numbers of men and women, were monitored for 24 months in their attempts to become regular exercisers. The persons included in the study were examined with the help of surveys, self-evaluations, interviews, journals and condition measurements. The types of exercise studied were jogging or walking briskly. The participants were recruited through advertisements and were in the ages of 30–50 with varying educational and professional backgrounds.

In the terminology of the transtheoretical model, these people were in the preparation stage or maybe even in the contemplation stage. One year after the start of the study, a follow-up telephone interview was conducted with the people who registered for, but were not included in the experiment. There, it came forth that only a small number of the 115 (of a total of 120) persons that could be reached had changed their exercise habits in a positive direction in the past year, in other words the project comprised a helping relationship, which is one of the transtheoretical model's processes of change.

Data was gathered every three months during the first 18 months and then after 24 months, which meant that the process in the changed exercise habits<sup>2</sup> could be studied in a somewhat in-depth manner.

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2. The term exercise/exercise habits refers to jogging or briskly walking the in the following.

### *Obstacles and their change over time*

From the analyses, it came forth that the prospective exercisers met with obstacles and problems of various types in the first months. It was not just a question of putting on one's trainers and heading out for a jog or walk to suddenly discover that one was a regular exerciser. Many decisions must be made and many practical details must be resolved. Where should I jog? How far? What should I wear? Shoes? Do training clothes need to be washed every time? Where are they stored in between exercise sessions? My hair gets sweaty! What will the neighbours say? Other obstacles that are often mentioned were related to certain practical arrangements having to be in place to be able to exercise, primarily the creation of new routines and, for instance, arranging a baby-sitter. Disruptive traffic, bad weather, bad road conditions, a fear of dogs, a fear of being molested, a fear of the dark, a lack of motivation, a lack of time, injuries and illness were other obstacles that showed up among the novice exercisers. To support and help the participants with the aforementioned issues and questions, in the first three months they had access to coaches who were regular exercisers themselves (3, 4).

Eventually, answers were found to the questions and solutions to the various practical problems, such as a hook in the cellar where the training clothes can hang in between exercise sessions. Of course, this phase takes varying amounts of time for the different individuals, but after a few months most matters were resolved and it was relatively easy to realise the exercise plans. However, it is important to remember that things happen in people's lives all the time that force planned exercise sessions to be cancelled and sometimes it can be a question of "beginning all over again". This is nothing unique, but rather happens to most people (3, 4).

### *Experiences and their change over time*

From the very beginning, starting to exercise provides different experiences that change in scope and content over time. At the beginning, there are quite a few negative experiences connected with a lack of condition and muscle strength, as well as feelings of monotony and boredom during the actual exercise. At the same time, there are also positive feelings of liberation, harmony, relaxation, a wonderful environment and pleasure at "getting the body moving". After the exercise, there is a relatively brief positive feeling – "it is nice to have done the exercise" (3, 4).

The change over time can be summarised by it initially being a matter of both positive and negative feelings in connection with the exercise, but once one is an accustomed exerciser, there are almost only positive feelings and experiences left during the exercise.

## Effects and their change over time

There is considerable agreement that exercise provides positive effects. From Wester-Wedman's study (3), it is clear that both the type of effect as well as its scope changes over time. The effects that the exercisers talk about are categorised as mental or physical, in both cases either short-term or long-term, and cognitive – a clear head, clears the mind – and social – common interest, new subject of conversation.

With regard to the mental and physical effects, they change over time from being highly short-term/specific to becoming increasingly long-term in both cases. In addition, the balance between both types of effects changes over time so that the physical, which are more prominent in the beginning, after a long time of regular exercise, also make way for mental effects. Examples of short-term/specific physical effects include having the energy to jog a longer distance and becoming less out-of-breath during the exercise, while long-term effects can include better condition, weight loss or acquiring leg muscles. Short-term mental effects can include feeling relaxed after jogging or being energised by the exercise, while long-term effects can include feeling calmer, having better self-confidence, a stronger psyche and becoming happier and more stable (3). The change in the effects over time are illustrated in figure 1.

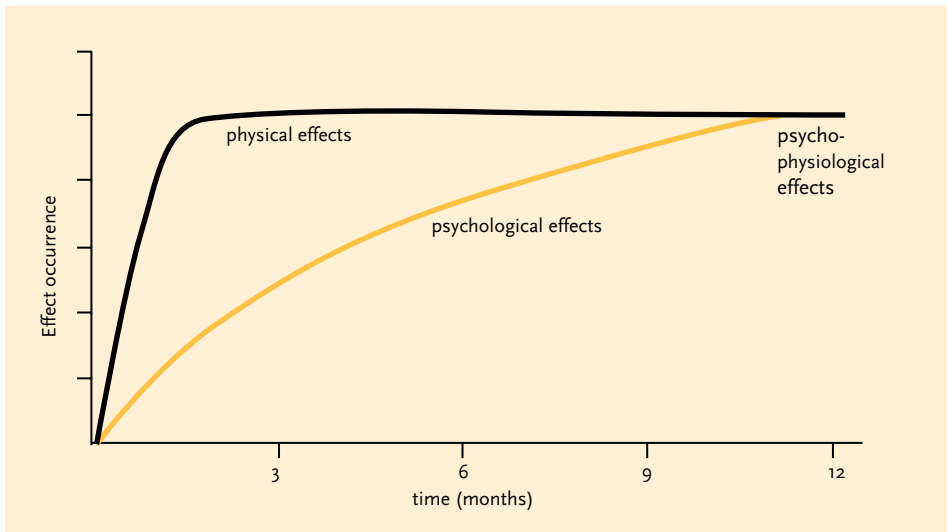


Figure 1. Development of physical and mental effects over time.

## Motivational change

As described above, there is a development and change in the obstacles, experiences and effects as exercise continues. The novice exerciser has no experiences or perceptions to rely on and in the beginning, “external” rewards are needed, such as encouraging shouts from family and friends, weight loss or improvements in jogging time per kilometre (24). In this phase, it is a matter of repeating the behaviour as often as possible with the help of these rewards from without. In transtheoretical terms, one can talk about the processes of helping relationships or reinforcement management. At this time, one has not yet become a regular exercise in the sense that the habits have not been established.

Gradually as time goes by and the behaviour is repeated, the exerciser gains more and more positive experiences and more perceived effects that gain a more long-term nature. These experiences are incorporated in the motivations and gain increasing significance as motives for continuation of the exercise, while the external motives decrease in importance. There is a change of the motives from “externally motivated” to “internally motivated” behaviour. The motives have been internalised and the exercise habits are established (3, 4). The individual has gone from the action stage via the maintenance stage and in some cases to the termination stage.

The changes over time in experiences and effects of exercising described above can be graphically illustrated with the help of a free interpretation of Solomon’s opponent-process theory of acquired motivation (23).

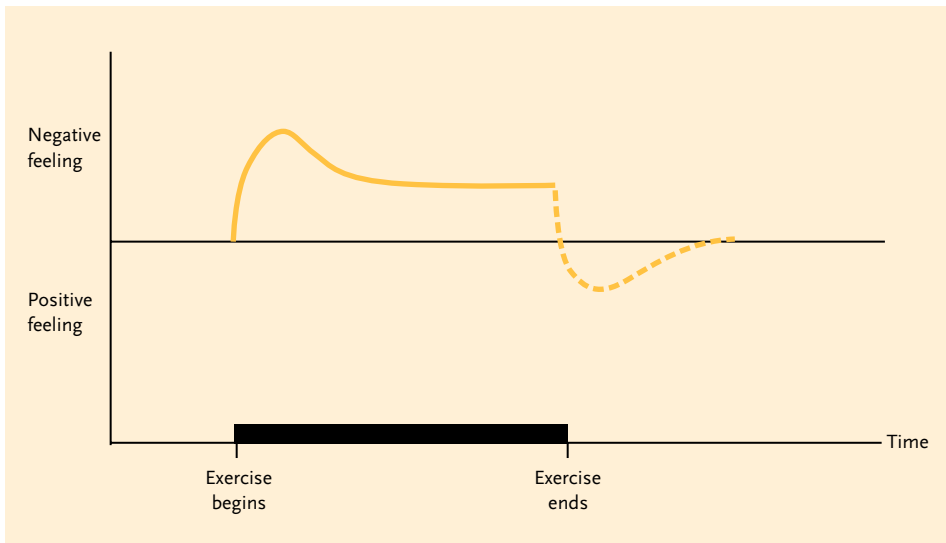
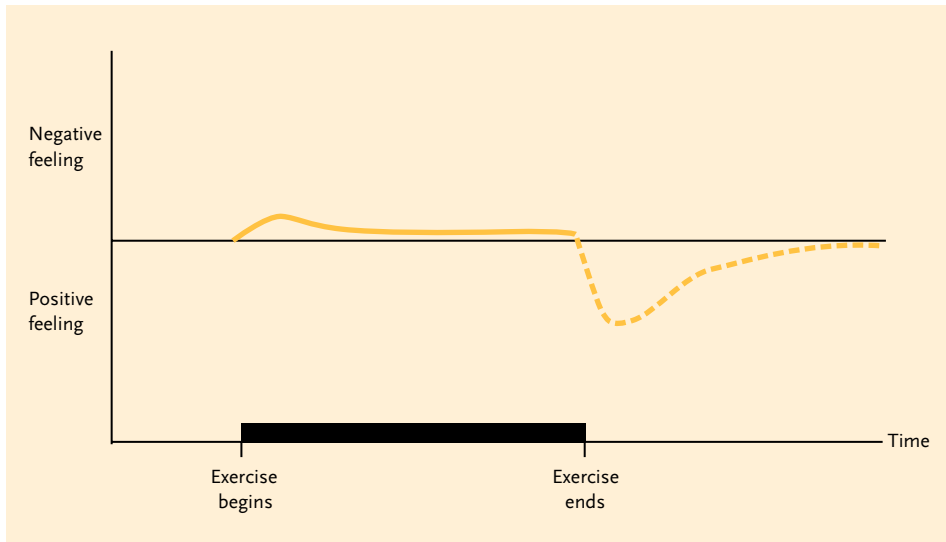


Figure 2. Perceptions of physical activity at an initial phase.

From figure 2, it can be seen that the perception of the actual exercise session in the initial phase is overwhelmingly negative, while the immediate after-effect is positive and relatively brief. The negative perceptions during the exercise session are primarily comprised of physical feelings of discomfort – heavy legs, heavy breathing, as well as boredom and monotony.

The positive after-effect that occurs immediately after the end of the exercise can be seen as a contrast effect that most often means that “it is nice that it is over”.



*Figure 3. Perceptions of physical activity after having exercised for some time.*

Figure 3, which describes the process in the experienced exerciser, shows that the perception during the actual exercise is nearly neutral. The physical exertion that the exercise nonetheless entails is perceived not at all as negatively, because condition and muscle strength has improved, something that often makes space for positive feelings during exercise.

The positive feeling after exercising is both stronger and more extensive in time in the experienced exerciser. According to the exercisers themselves, the content of this feeling is also qualitatively different than the novice exerciser’s immediate after-effect.

In summary, it can be confirmed that it takes time to go from being passive to being regularly active, at least six months or more. This is very individual and depends on the individual’s life situation otherwise, such as his/her age, gender, family and work situation. During this time, a great deal can happen – seasons change, a holiday can occur, the weather can occasionally be poor and work and family may demand extra attention. In addition to this, temporary illness or injury may also occur and there are also a great many other things that one is to have time to do during one’s free time (3, 4).

## *Women and men*

In this chapter, the completely neutral term of “exerciser” was used without problemising any differences between men and women. From Wester-Wedman’s study (3), it is clear that men and women perceive different types of obstacles and their extent. Perceptions and effects are also of different types and scopes and the time that it takes to go from being a novice to a regular exerciser differs, due in part to the aforementioned factors. However, the process progresses in the same manner with the same factors involved, although at a different pace, for men and women. A follow-up study shows that many women prefer less physically demanding types of exercise, such as walking instead of jogging, when they themselves choose exercise activity (25).

## *The physical activity must be adapted to the individual’s conditions*

An important part of the many messages given in connection with performing regular physical activity is that the conditions vary between people. Age, gender and religion are some conditions. Being a parent or not and having certain disabilities, etc. also belong to these. Some of these conditions cannot be changed and affect the possibilities of performing regular physical activity. Instead, the physical activity must be adapted to these conditions and look differently for a single parent than for a person who lives under other conditions, for example.

In addition to this, is the central aspect of achieving an impact towards becoming physically active. The transtheoretical model provides conditions for this to be able to occur (5). According to this model, it is accepted that the change means moving from being entirely uninterested in physical activity to being a regular exerciser. This move is about the same for everyone, but the change can look differently for separate individuals. In principle, this is a matter of going from a high level of external motivation to a high level of internal motivation (3).

Consequently, it takes significantly more time to adapt mentally than to do so physiologically. It is only when the two curves (see figure 1) meet that the exercise functions on its own – meaning as a result of internal motivation. Change takes time (3, 5, 14). Consequently, it must be a central component of the change process that it be allowed to take time and that the external support remains for a considerable period of time, in one way or other. Within healthcare, the local healthcare centres can, for example, be given a special role in this respect.

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## References

1. Bolin K, Lindgren B. Fysisk inaktivitet. Produktionsbortfall och sjukvårdskostnader. [Physical inactivity. Production losses and healthcare costs.] Stockholm: Friluftsförbundet i samverkan (FRISAM); 2006.
2. Bunkefloprojektet. [The Bunkeflo Project.] <http://www.bunkeflomodellen.com/>.
3. Wester-Wedman A. Den svårfångande motionären. En studie avseende etablerandet av regelbundna motionsvanor. [The elusive exerciser. A study of the establishment of regular exercise habits.] Diss. Umeå: Umeå University; 1988.
4. Wester A. Den svårfångade motionären. [The elusive exerciser.] In: Kindeberg T, Svederberg E, Svensson L, eds. Pedagogik i hälsofrämjande arbete. [Pedagogy in health promotion work.] Lund: Studentlitteratur; 2001. pp. 185-206.
5. Prochaska JO, Norcross JC, DiClemente CC. Changing for good. A revolutionary six-stage program for overcoming bad habits and moving your life positively forward. New York: Quill; 2002.
6. Faskunger J. Motivation för motion. En handbok för hälsovägledning steg för steg. [Motivation for exercise. A handbook for health counselling step-by-step.] Farsta: SISU Idrottsböcker; 2002.
7. U.S. Department of Health and Human Services. Physical activity and health. A report of the Surgeon General. Atlanta (GA): U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease. Prevention and Health Promotion; 1996.
8. Boström G. Levnadsvanor och hälsa. [Living habits and health.] In: Ardbo C, ed. Folkhälsorapport 2005. [Public Health Report 2005.] Stockholm: Swedish National Board of Health and Welfare; 2005. pp. 292-332.
9. Västerbotten County Council. Manual 2004 för Västerbottens hälsoundersökning. [Manual 2004 for Västerbotten health survey.] Umeå: Samhällsmedicin, Landstingskontoret, Västerbotten; 2004.
10. Weinehall L. Personal communication on 7 June 2007.
11. Arvidsson O, ed. Att förändra levnadssätt. Rapport från ett symposium om metoder att förbättra folkhälsa, 1 och 2 oktober 1981. [Changing lifestyle. Report from a symposium on methods to improve public health, 1-2 October 1981.] Riksbankens Jubileumsfond 1982:3. Stockholm: Liber/Allmänna förlag; 1982.
12. Glanz K, Rimer BK, Lewis FM, eds. Health behavior and health education. Theory, research and practice. 3. edn. San Francisco: Jossey-Bass; 2002.
13. Sallis JF, Owen N. Physical activity & behavioral medicine. Thousand Oaks (CA and London): Sage; 1999.
14. Stevens M. Groningen Active Living Model. Development and initial validation. Diss. Groningen: Rijksuniversiteit Groningen; 2001.
15. SBU (Swedish Council on Technology Assessment in Health Care). Metoder för att främja fysisk aktivitet. En systematisk litteraturoversikt. [Methods for promoting physical activity. A systematic literature review.] March 2007. Report 18. Stockholm: SBU; 2007.

16. Prochaska JO, Redding CA, Evers KE. The transtheoretical model and stages of change. In: Glanz K, Rimer BK, Lewis FM, eds. *Health behavior and health education. Theory, research and practice*. 3. edn. San Francisco: Jossey-Bass; 2002. pp. 99-120.
17. Spencer L, Admans TB, Malone S, Roy L, Yost E. Applying the transtheoretical model to exercise. A systematic and comprehensive review of the literature. *Health Promotion Practice* 2006;7:428-43.
18. Guillot MA, Kilpatrick M, Hebert E, Hollander D. Applying the transtheoretical model to exercise adherence in clinical settings. *American Journal of Health Studies* 2004;19:1-10.
19. Prochaska JO. Staging. A revolution in helping people change. *Manag Care* 2003;12:6-9.
20. Fallon EA, Hausenblas HA. Transtheoretical model. Is termination applicable to exercise? *American Journal of Health Studies* 2004;19:35-44.
21. Weinberg RS, Gould, D. *Foundations of sport and exercise psychology*. 2. edn. Champaign (IL): Human Kinetics; 1999.
22. Bandura A. *Self-efficacy. The exercise of control*. New York: W.H. Freeman and Company; 1997.
23. Solomon RL. The opponent-process theory of acquired motivation. The costs of pleasure and the benefits of pain. *American Psychologist* 1980;35:691-712.
24. Jung J. *Understanding human motivation. A cognitive approach*. New York: MacMillan; 1978.
25. Wester-Wedman A. Hur gick det sen för motionärerna? En uppföljning av motionsprojektet. [How did it go for the exercisers afterwards? A follow-up of the exercise project.] In: Patriksson G, ed. *SVEBI:s årsbok 1990*. [SVEBI Annual 1990.] Svensk förening för Beteende-vetenskaplig Idrottsforskning; 1990.

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