

Self-regulation strategies and exercise

*A cross-sectional study analysing different self-regulatory strategies and their association
with exercise in young adults (16-25 years)*

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Abstract

Regular exercise is important for one's physical health. Nevertheless, research has shown that with increasing age the amount of exercise performed by people is decreasing. The use of self-regulation strategies may determine exercise engagement in young adults. Examining the association between self-regulation strategies and exercise may be of use in order to design effective interventions that aim to increase exercise in young adults via self-regulation strategies. Therefore, the present research investigated the relationship between different types of self-regulation strategies used by young adults (16-25 years) and the degree of exercising performed by them. Data for this cross-sectional study (N = 48) was obtained via an online questionnaire distributed via Facebook and LinkedIn. A linear regression analysis was performed to analyse the association between ten self-regulation strategies and exercise in young adults. The self-regulation strategy self-monitoring ($\beta = .45$, $t = 2.66$) was found to have a significant association with exercise. Intrinsic motivation was found to have a moderating effect on the association between the self-regulation strategy self-monitoring and exercise. It can be concluded that young adults who score higher on the self-monitoring strategy, also score higher for exercise. This association is positively moderated by intrinsic motivation.

Keywords: self-regulation, strategy, exercise, young adults

Introduction

Self-regulation strategies and exercise

Young adulthood (16 to 25 years old) is an important period in life to work on one's physical health by, for example, engaging in regular exercise (i.e., physical activity or leisure time physical activity). Regular exercise is important for physical health as research has shown it has a protective effect against at least 35 chronic disorders and promotes longevity (Booth, Roberts, & Laye, 2012; Pedersen, 2019). In spite of the proven benefits of regular exercise on one's health, a decrease in the amount of exercise is seen as children become older. This decrease becomes even bigger after the age of 14 (Kemper & Mechelen, 1995; Verbrugge, Gruber-Baldini, & Fozard, 1996). According to recently published data of Statistics Netherlands (CBS) 55% of four- to eleven year olds met the Dutch exercise guidelines in 2017, whereas only 28% of twelve- to seventeen year old met the guidelines (Rijksinstituut voor Volksgezondheid en Milieu, 2017). The Dutch guidelines of the Health Council (Gezondheidsraad) (2017, p. 3) for exercise in children from four- to seventeen years old include the following:

“Exercise is good, more exercise is better. Do moderate exercise at least every day for an hour. Exercising longer, more often and / or more intensively gives you an additional health benefit. Do muscle and bone-strengthening activities at least three times a week. And: avoid sitting still a lot.”

Knowing that the amount of regular exercise decreases when children become older, it is important to establish regular exercise habits during young adulthood so that these habits may persist when transferring into adulthood (Aarts, Paulussen, & Schaalma, 1997).

In order to increase regular exercise and establish exercise habits, via interventions for instance, it is of importance to identify possible psychological determinants of exercise engagement. For example, self-regulation is such a psychological determinant that is also amenable to intervention.

Self-regulation

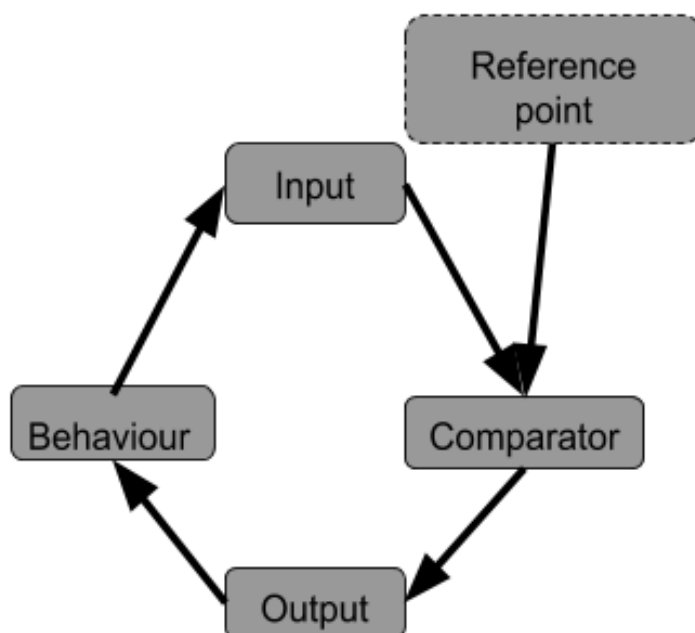
Self-regulation is defined as a controlled process “by which an individual initiates, adjust, interrupt, terminate, or otherwise alter actions to promote attainment of personal

SELF-REGULATION STRATEGIES AND EXERCISE

goals, plans, or standards” (Baumeister, Heatherton, & Tice, 1993; Baumeister, Heatherton, Tice, & Baumeister, 1994; Heatherton & Ambady, 1993; Scheier & Carver, 1988). Self-regulation has been identified as an important determinant of exercise (Dishman, 1994; Dishman, Ickes, & Morgan, 1980), since exercise is a type of behaviour that demands discipline (Mclachlan & Hagger, 2010; Sniehotta, Scholz, & Schwarzer, 2005). For instance, in exercise, self-regulation may refer to controlled processes that promote the attainment of one’s goal to go to the gym on a two days per week basis. Self-regulation may be exhibited via various strategies.

The Feedback system by Miller, Galanter, and Pribram (1960) is a self-regulation theory that sees behaviour change as a gradual process in which behaviours are continuously reevaluated, see *figure 1*. The feedback system acknowledges five components that behave in a cyclical way. First a *goal* behaviour or *reference point* is set. After setting a reference point the *current behaviour* or *input* is *compared* to this reference point. Comparing the current behaviour and the goal behaviour leads to an *output*, which will state if the current behaviour has to be adjusted in order to reach the goal or if the goal has been obtained. If the goal is not yet obtained, *behaviour* is adjusted leading to a new *input* to be compared.

Figure 1 - *Feedback system* by Miller, Galanter, & Pribram (1960)



Self-regulation strategies

Different strategies for self-regulation can be used when regulating one's behaviour. As of yet, research on self-regulation strategies is not extensive and a clear overview of all existing strategies is lacking. In addition, the research into self-regulation has mainly focused on the self-regulation strategy inhibition. Inhibition can be referred to as a strategy in which you inhibit unwanted responses or ignore impulses and not acting on them in order to attain a goal. In fact, it was seen as one of the most important strategies of self-regulation and it was estimated that 80 to 90 percent of all self-regulation in one day consisted of inhibition (Baumeister et al., 1994). Despite the importance of this strategy, more recent research by Baumeister (2014) had shown that this strategy can become depleted, making the restraints weaker and the impulses stronger. Michie and colleagues (2009) who studied multiple self-regulation strategies have also found other strategies, such as self-monitoring, to be at least as important as inhibition or even more important. The importance of self-monitoring has been confirmed, as analyses showed that the strategy of self-monitoring plus an other strategy had a pooled effect size of 0.42 (95% CI 0.30 to 0.54) whilst other evaluations had a pooled effect size of 0.26 (95% CI 0.21 to 0.30) (Michie et al., 2009).

The present research will focus on the following strategies, which are assumed to be the most important strategies for the attainment of personal goals according to literature. 1) Situation selection entails "intentionally choosing to be in situations that favour goal-oriented valuation systems over temptation-oriented valuation systems" (Duckworth, Szabó Gendler, & Gross, 2016). Related to exercise, this could mean that a person goes to the gym to do exercises instead of exercising at home where circumstances are less easy to do the same exercise. 2) The strategy of cognitive change is about thinking differently about the situation, such as thinking that exercising will boost one's mood instead of thinking that exercise takes a lot of effort (Duckworth et al., 2016). Redirecting thoughts can both be general thoughts as well as emotional reactions (Wallace, Edwards, Shull, & Finch, 2009). 3) Prospection, also termed planning, comprises all thoughts about- and anticipations of the future (Mann, De Ridder, & Fujita, 2013). With regard to exercise, this may entail the anticipation of possible obstacles, such

SELF-REGULATION STRATEGIES AND EXERCISE

as being tired at the end of the day, and taking action to preventatively mitigate these obstacles. For example, this may mean exercising at the start of the day when you are not yet tired. 4) Automatisation is about goal-performing behaviour without having to “consciously attend to their environment for goal-relevant opportunities”, this happens, for instance when exercising has become a habitual behaviour after repeated performing (Mann et al., 2013). 5) (Effortful) inhibition is “the process by which people attempt to fight off or suppress thoughts, feelings, and behaviours that are contrary to their goals through conscious monitoring and effort” (Mann et al., 2013). Within the context of exercise, this can refer to taking effort to not think about how much more pleasant it would be to relax on the couch than to exercise. 6) Self- monitoring entails the evaluation of the current behaviour and comparing this behaviour with the set goal. E.g. monitoring to ensure the goal to run at a pace of ten kilometers per hour is being met (Carver & Scheier, 1982). 7) Seeking social support, implies seeking help from the social environment in obtaining the goal. For exercise, this could mean that you rely on the supporting words of friends in order to go exercise (Zimmerman, 1986; Zimmerman & Bandura, 1994). 8) The self-control strategy of initiation is based on research by De Ridder and colleagues (2011) and aims at initiating desired behaviour, such as going to the gym more often. 9) The strategy of persistence, the ability to be determined to attain a goal, has not been studied extensively in the context of a self-regulation strategy but it has been thought to play an important role in the attainment of exercise goals. For example, when one is feeling less motivated to keep exercising one stays persistent to one’s goal of training two times a week. 10) Self-reward is a strategy whereby one rewards oneself after achieving a set goal, for instance, by rewarding oneself with buying new clothes after obtaining an exercise goal (Mahoney & Thoresen, 1972).

Previous research

Previous research has focused primarily on identifying self-regulation strategies, focused on the theoretical framework of self-regulation, or only focussed on a few self-regulation strategies in relation to exercise. Therefore, research into the relationship between self-regulation strategies and exercise has not yet been properly investigated.

SELF-REGULATION STRATEGIES AND EXERCISE

Self-regulation strategies that have been mentioned in research related to exercise are situation selection, self-monitoring, and goal setting. Research by Duckworth and colleagues (2016), using the process model of self-control, argued that situational strategies such as situation selection should be more effective than intrapsychic strategies such as attention deployment. Intrapsychic strategies, such as attention deployment, are strategies that must target the influences that have already reached the mental processes. Duckworth and colleagues (2016) argue that impulses are best to be stopped in the first step of the impulse generation cycle as impulses tend to grow over time, making them more difficult to control. Therefore, because situation selection is the first strategy in this impulse generation cycle, it is seen as a more effective strategy than other strategies such as intrapsychic strategies (Duckworth et al., 2016). Research by Michie and colleagues (2009) on self-regulation strategies and exercise in interventions showed that out of 26 behaviour change techniques analysed, self-monitoring, in combination with any other strategy mentioned in the research, was the most effective strategy. Lastly, research by Sas-Nowosielski and Szopa (2015) on the self-regulation strategies goal-setting, self-monitoring, enlisting social support, self-rewarding and stimulus control showed that the strategy goal setting was the strongest predictor of exercise in both men and woman. Next to goal setting, seeking social support was also a predictor of exercise in women.

Previous research has also identified a potential mediator and moderator in the relationship between self-regulation strategies and exercise. Self-efficacy, as described by Bandura (2010, p. 1) as “people’s beliefs in their ability to influence events that affect their lives”, has shown to be a mediator in the relation between self-regulatory strategies and physical activity (Rovniak, Anderson, Winett, & Stephens, 2002). High perceived self-efficacy is linked to higher use of self-regulatory strategies (Zimmerman, 1986; Zimmerman & Bandura, 1994) and the use of self-regulatory strategies (e.g., self-evaluation) has been linked to enhancing self-efficacy (Schunk, 1996). High self-efficacy has also been linked to more exercise behaviour (Dishman et al., 2005). In a 2006 study by Gillison, Standage, and Skevington motivation has been found to be a moderator in the relation between self-regulation and physical activity. Furthermore, they have found that intrinsic motivation positively predicted exercise, while extrinsic motivation negatively predicted exercise in British secondary school children. Similar results have

SELF-REGULATION STRATEGIES AND EXERCISE

been found in research by Mclachlan and Hagger (2010) for internal and external regulation in correlation with exercise.

The present research

Although the use of various self-regulation strategies may be useful in engaging in exercise, research on the relationship between the adoption of various types of self-regulation strategies and the degree of exercise performed by young adults is lacking. Therefore, the following research question will be examined: *‘What is the relation between the different types of self-regulation strategies used by young adults (16-25 years) living in The Netherlands and the degree of exercising performed by them?’*. To answer this question, I will (1) analyse the relation between different self-regulatory strategies and exercise in young adults, and (2) perform mediator and moderator analyses for the relation between self-regulation strategies and exercise in young adults.

Based on previous research, it is hypothesised that of the ten previously mentioned self-regulation strategies, situation selection, cognitive change, seeking social support, and self-monitoring are associated with more exercise in young adults than the other strategies. Moderator for this association, in accordance with the literature, will be; motivation. Self-efficacy will be a mediator in the association between self-regulation and exercise.

Method

Participants

Young adults between the age of 16 to 25 ($M = 22.62$, $SD = 2.24$) living in The Netherlands were recruited via Facebook and LinkedIn to participate in this cross-sectional study ($N = 48$). Most participants were female (72.9%) and higher educated (66.7%), compared to 4.2% being lower educated and 29.2% middle educated. After calculating, a minimum of 131 participants were required to detect an effect size of 0.15 with a power of 80 %.

SELF-REGULATION STRATEGIES AND EXERCISE

Procedure

Participants were eligible for this cross-sectional study if they met the age requirements, lived in The Netherlands, and accepted the online informed consent. The questionnaire was made available online via the survey tool Qualtrics (Qualtrics, Provo, UT). With regard to the questionnaire, participant first had to fill in some basic socio-demographic characteristics, then they were asked questions from the first part of the Goal Setting and Striving Inventory (GSSI). After filling in the first part of the GSSI they filled in the Godin-Shephard leisure-time physical activity questionnaire (GSLTPAQ) (Amireault & Godin, 2015; Godin, 2011) and afterwards the second and third part of the SRSQ.

Measures

Self-regulation

Self-regulation was measured using the GSSI, see *appendix A*. The GSSI consists of three parts, asking participants '*which goals apply to you*', '*goal perception about the most important goal*' and '*self-regulation strategies to achieve your most important goal*'. First, participants were asked to evaluate which of the 33 example goals applied to them or not. Moreover, participants were able to add an additional goal that applied to them if that was not previously listed. Before participants answered goal-perception related questions, participants had to indicate their most important exercise-related goal. Options were either 'Exercise more often', 'Getting better at my sport', 'Take the bike or walk more often', or they could state their own exercise goal. After indicating their most important exercise related goal, participants were asked five goal-perception questions (e.g. 'I doubt if I can achieve this goal') and ten self-regulation strategy questions (e.g. 'I check if I am making progress') about their most important exercise goal. Goal-perceptions were: self-efficacy (e.g. 'I doubt if I can achieve this goal'), locus of control, extrinsic motivation (e.g. 'I want to achieve this goal because others expect me to'), intrinsic motivation (e.g. 'this is a goal I personally want to achieve'), and task aversion. The self-regulation strategies were: situation selection, cognitive change, prospection, automatisaion, inhibition, self-monitoring, seeking social support, persistence, procrastination and self-reward. Participants had the possibility to state an additional self-regulation strategy if

SELF-REGULATION STRATEGIES AND EXERCISE

that was not previously mentioned. Goal-perception and self-regulation strategy questions were rated on a visual analogue scale (VAS) ranging from 0, *not applicable at all*, to 100, *fully applicable*.

Exercise

Exercise was measured using the validated GSLTPAQ (Amireault & Godin, 2015; Godin, 2011), see *appendix A*. The GSLTPAQ contains 4-items that inquire participants about the number of times one exhibited ‘mild’ (e.g. yoga or walking), ‘moderate’ (e.g. tennis or cycling at a slow pace), and ‘strenuous’ (e.g. running or soccer) exercise on a typical 7-day period for at least 15 minutes. These frequencies were then multiplied with their corresponding Metabolic Equivalent of Task (MET) values, where mild, moderate and strenuous have values of 3, 6 and 9, respectively. This results in a total score with the following formula: Weekly leisure-time activity score (WLTAS) = $(9 \times \text{Strenuous}) + (5 \times \text{Moderate}) + (3 \times \text{Mild})$.

Socio-demographic characteristics

Socio-demographic characteristics collected included age, gender and highest obtained educational level, see *appendix A*. For gender, participants had the option to choose between *male*, *female*, or *other*. To measure highest obtained education level participants had to choose between: *primary education*, *primary or preparatory education*, *lower general secondary education (VMBO)*, *intermediate vocational education (MBO)*, *higher general secondary education or pre-university education (HAVO or VWO)*, *college education (HBO)*, *academic education (WO)*, *other*, *not applicable*. These options were then recoded into *low-*, *middle-*, and *high educational level* in accordance with Statistics Netherlands (CBS) (2016). ‘Primary education, primary or preparatory education and VMBO’ were recoded into low educational level, ‘MBO and HAVO or VWO’ were recoded into middle educational level and ‘HBO and WO’ were recoded into high educational level. The options ‘other’ and ‘not applicable’ were recoded into *other*.

SELF-REGULATION STRATEGIES AND EXERCISE

Analyses

All data analyses were performed using the Statistical Program for Social Sciences (SPSS) version 26.0. Data analysis consisted of five phases. First, data was cleaned, recoded into numeric data and labelled. Second, descriptive statistics were used for a frequency table describing participant characteristics (e.g., socio-demographic characteristics), used self-regulation strategies, and degree of exercise. Third, assumptions of linear regression analyses were checked. Fourth, the association between self-regulation strategies and exercise was analysed through a multiple linear regression analysis. Fifth, self-efficacy and intrinsic- and extrinsic motivation were investigated as a potential mediator or moderators. Lastly, regression analysis was corrected for the mediator self-efficacy and the moderators intrinsic- and extrinsic motivation if they were found to have a significant relation. For the mediator analyses, three linear regression analyses were conducted, namely: between the independent and the dependent variable, the independent variable and the mediator, and the mediator and the dependent variable. For the mediator analyses, the independent variables were the ten self-regulation strategies, the dependent variable was exercise and the mediator was self-efficacy. For the moderator analyses, data of the moderator and the independent variables was centralised and a new variable was made by multiplying the centralised independent variable with the centralised moderator. Centralised independent variable, centralised moderator, the new variable and the dependent variable were then entered into a regression analysis. In this model, exercise was the continuous dependent variable and the self-regulation strategies were the continuous independent variables.

Results

The mean score for exercise in WLTAS was 41.13 (SD = 21.97). With regard to the use of self-regulation strategies for the goal of exercising, the highest mean score for self-regulation strategies was observed for the strategy automatism (M = 64.42, SD = 28.98), while the lowest mean score was observed for the strategy self-reward (M = 41.46, SD = 28.21). The exercise goal 'exercise more often' (60.4 %) was chosen most often to be the most important exercise goal, followed-up by 'take the bike or walk more often' (18.8 %), and 'get better at my sport' (16.7 %). Additional chosen exercise goals

SELF-REGULATION STRATEGIES AND EXERCISE

Table 1 - Demographics for young adults (age 16 - 25) living in The Netherlands (N = 48)

Characteristics	N	%	Mean	SD
Gender	48			
Male	13	27.1	-	-
Female	35	72.9	-	-
Other	0	0	-	-
Age (years)	48	-	22.62	2.24
Educational level	48			
Low	2	4.2	-	-
Middle	14	29.2	-	-
High	32	66.7	-	-
Other	0	0	-	-
Exercise goal	48			
Exercise more often	29	60.4	-	-
Take the bike or walk more often	9	18.8	-	-
Get better at my sport	8	16.7	-	-
Other	2	4.2	-	-
Weekly exercise score*	48	-	41.13	21.97
Self-efficacy	48	-	34.27	28.44
Intrinsic motivation	48	-	83.23	19.98
Extrinsic Motivation	48	-	21.02	23.84
Self-regulation strategies	48			
Situation selection	-	-	54.58	33.57
Cognitive change	-	-	42.46	27.02
Prospection	-	-	45.08	33.87
Automatisation	-	-	64.42	28.98
Inhibition	-	-	60.06	26.69
Self-monitoring	-	-	54.42	31.11
Seeking social support	-	-	48.46	32.34
Persistence	-	-	63.69	26.25
Procrastination	-	-	50.65	31.43
Self-reward	-	-	41.46	28.21

Note.

N = sample size; M = mean; SD = standard deviation

** Measured by Weekly leisure-time activity score*

were ‘try a new sport’ and ‘create a daily exercise routine’. All data on descriptives can be found in table 1.

Multiple linear regression analyses were performed to determine the association between ten self-regulation strategies and exercise. Before performing linear regression analyses, assumptions for linear regression analysis were checked. Linearity was assessed by plotting a p-p plot and scatterplot and visually inspecting these plots. There was

SELF-REGULATION STRATEGIES AND EXERCISE

homoscedasticity and normality of residuals. One participant with a score of 360 on WLTA was perceived as an outlier and was removed from the analyses due to not being representative of the target-population.

After performing a linear regression analysis, one significant predictor ($p < .05$) was observed between exercise and the ten self-regulation strategies, namely; self-monitoring ($\beta = .45$, $t = 2.66$, $p = .01$). Data on associations can be found in table 2, and a correlation matrix can be found in appendix B.

Performing moderator analyses for the moderators intrinsic and extrinsic motivation revealed that intrinsic motivation has a significantly ($p < .05$) moderating effect in the association between exercise and the self-regulation strategy self-monitoring ($\beta = .68$, $t = 5.19$, $p = .00$). Extrinsic motivation has not been found to have a significant moderating effect in the association between exercise and the self-regulation strategy self-monitoring. After correcting for the moderator intrinsic motivation in the association between exercise and the ten self-regulation strategies, a β of respectively .51 ($t = 3.11$, $p = .00$) was observed for self-monitoring.

Self-efficacy was shown to have no mediating effect on the association between the ten self-regulation strategies and exercise, as indicated by the absence of a significant association between self-efficacy and exercise ($\beta = -.11$, $p = 0.44$).

Table 2 - Results of linear regression analyses for exercise and self-regulation strategies in young adults (age 16 - 25)

Self-regulation strategies	Std β	SE	t	CI95 LB	UB	P
Situation selection	-.22	.12	-1.20	-.38	.10	.24
Cognitive change	.21	.15	1.10	-.14	.48	.28
Prospection	.20	.10	1.31	-.07	.33	.20
Automatisation	.12	.12	.74	-.16	.33	.47
Inhibition	-.03	.16	-.13	-.33	.29	.89
Self-monitoring	.45*	.12	2.66	.08	.56	.01
Seeking social support	-.14	.10	-.93	-.30	.11	.36
Procrastination	-.03	.12	-.17	-.26	.22	.87
Persistence	.10	.16	.52	-.24	.41	.61
Self-reward	.04	.11	.30	-.18	.25	.76

Note.

Std β = standardised beta coefficient; SE = standard error; t = t-value;

CI95 = 95% confidence interval for expected beta coefficient; LB; lower bound; UB; upper bound

P = p-value

* $p < .05$

Discussion

Young adulthood is an important stage in life to work on one's physical health and establish long-lasting healthy exercise habits. In order to increase the level of exercise in young adults it is of importance to determine what self-regulation strategies may enable exercise as they have been shown to be important determinants of exercise (Dishman, 1994; Dishman, Ickes, & Morgan, 1980). The aim of the present research was therefore to assess the association between self-regulation strategies and the amount of exercise performed by young adults living in The Netherlands. A potential mediator, namely self-efficacy, and two possible moderators, namely intrinsic and extrinsic motivation were also tested. The hypothesis for this research, which stated that the self-regulation strategies situation selection, cognitive change, seeking social support, and self-monitoring are associated with more exercise, is partially supported by the present findings. As hypothesized the self-regulation strategy self-monitoring was significantly associated with more exercise, compared to other self-regulation strategies. By contrast, the self-regulation strategy cognitive change was not associated with more exercise compared to other self-regulation strategies. Contrary to the hypothesis, the self-regulation strategies of situation selection and seeking social support were negatively associated with exercise, but association was found to be not significant. With regard to a potential mediating effect of self-efficacy and a moderating effect of intrinsic and extrinsic motivation, only intrinsic motivation was shown to have a significant moderating effect on the association between the self-regulation strategy self-monitoring and exercise. Intrinsic motivation had shown to have a positive relation with the association between self-monitoring and exercise, strengthening their association.

Looking further at the main findings from the present research it does not come as a surprise that self-monitoring was shown to have a significant positive association with exercise. Michie and colleagues (2009) had already shown in their research that self-monitoring was the most important behaviour change technique compared to 26 other techniques in physical activity interventions. Looking at the findings that deviate from the hypothesis, it can be explained that the self-regulation strategies that do not have a association with exercise (i.e. situation selection and seeking social support) but do have

SELF-REGULATION STRATEGIES AND EXERCISE

a negative beta coefficient may be similar to extrinsic motivation. In explanation, extrinsic motivation is a negative predictor of exercise (Gillison et al., 2006). For the self-regulation strategy situation selection to be similar to extrinsic motivation, the following could be hypothesised: people who are more likely to use the strategy of situation selection might be more dependent of situations that favour the goal-oriented system in order to reach their goal (i.e. exercise). Being more dependent of favourable goal-oriented situations might be a sign of higher extrinsic motivation and a lower intrinsic motivation to exercise. Goal-oriented situations can be seen as a form of external factors on which extrinsic motivation depends. As extrinsic motivation is a negative predictor of exercise (Gillison et al., 2006), situation selection as a strategy may therefore also have a negative relation with exercise. The same can be thought about the self-regulation strategy seeking social support, namely: people who are more dependent of social support to attain their goal (i.e. exercise) may have a higher extrinsic motivation and a lower intrinsic motivation to exercise. Social support can be seen as a form of an external factor on which extrinsic motivation depends, and may therefore have similar associations as extrinsic motivation to exercise. Data of this research does not confirm this line of thought, yet due to a low number of participants findings should be interpreted with caution. Regarding a mediating effect by self-efficacy, which had no correlation with exercise in the present research, no possible explanation could be found. Yet, previous studies have shown a correlation between self-efficacy and exercise (Blanchard et al. 2007; Dishman et al. 2005; Morris, McAuley, & Motl, 2008; Prodaniuk, Plotnikoff, Spence, & Wilson, 2006; Schwarzer, Luszczynska, Ziegelmann, & Wilson, 2008). The difference in findings between the present research and previous research could possibly be explained by low number of respondents in the present research, therefore a correlation between self-efficacy and exercise could not be found.

Implications for Future Research

The result of this study implicate that young adults whom use the self-regulation strategy self-monitoring to a greater extend exercise more often. Therefore, results of this research can be used for designing interventions aimed at increasing exercise in young adults with the use of self-regulation strategies such as self-monitoring. Future research

SELF-REGULATION STRATEGIES AND EXERCISE

could also focus on identifying other self-regulation strategies that apply specifically to people with exercise-related goals. Identifying these specific strategies can be useful, as they can be highly associated with more exercise and may therefore be useful to include in interventions aimed at increasing exercise engagement of people.

This study knows several strengths and limitations. To the best of our knowledge, this is the first study to examine the correlation between ten self-regulation strategies and exercise in young adults. Previous research only focussed on a few self-regulation strategies (e.g., Matthew & Moran, 2011; Sas-Nowosielski & Szopa, 2015), or on older people (e.g., Umstatter, Wilcox, Saunders, Watkins, and Dowda, 2008).

A low number of respondents is a first limitation of this study. Performing a power analysis revealed that a number of 131 participants was sufficient in order to detect an effect size of 0.15 with a power of 80 %. However, recruitment of participants was made difficult due to the COVID-19 pandemic (i.e. coronavirus pandemic) and social distancing measures imposed by the Dutch Government (RIVM, 2020). Specifically, the closing of all schools and universities starting March 16th prevented the possibility of recruiting respondents via flyers at school, universities or other locations often visited by young adults. This resulted in less participants than needed, therefore results of this study must be interpreted with caution as they may be of lower reliability. A second limitation of this study is that the questionnaire did not take into account participants that do not have an exercise related goal. Participants were only able to choose from exercise related goals when choosing their most important goal, although an exercise related goal may not have been their most important one. This can result in lower correlations between exercise and self-regulation strategies as participants answer goal setting and self-regulation related questions about a goal that is not their most important one. Future research should consider the fact that not everyone has an exercise related goal in his or her life.

Concluding, self-monitoring is a self-regulation strategy associated with more exercise in young adults living in The Netherlands. This association is moderated by intrinsic motivation. Future interventions aimed at increasing the amount of exercise in young adults should consider implementing the self-regulation strategie self-monitoring

SELF-REGULATION STRATEGIES AND EXERCISE

in their intervention, as it is associated with more exercise, whilst focussing on stimulating the intrinsic motivation to exercise.

References

- Aarts, H., Paulussen, T., & Schaalma, H. (1997). Physical exercise habit: on the conceptualization and formation of habitual health behaviours. *Health Education Research, 12*(3), 363–374. doi:10.1093/her/12.3.363
- Amireault, S., & Godin, G. (2015). The Godin-Shephard leisure-time physical activity questionnaire: Validity evidence supporting its use for classifying healthy adults into active and insufficiently active categories. *Perceptual & Motor Skills: Physical Development & Measurement, 120*, 1–19. doi:10.2466/03.27.PMS.120v19x7
- Bandura, A. (2010). Self-efficacy. *The Corsini Encyclopedia of Psychology*, 1–3. doi:10.9780470479216.
- Baumeister, R. F. (2014). Self-regulation, ego depletion, and inhibition. *Neuropsychologia, 65*, 313–319. doi:10.1016/j.neuropsychologia.2014.08.012
- Baumeister, R. F., Heatherton, T. F., & Tice, D. M. (1993). When Ego Threats Lead to Self-Regulation Failure: Negative Consequences of High Self-Esteem. *Journal of Personality and Social Psychology, 64*(1), 141–156. doi:10.1037/0022-3514.64.1.141
- Baumeister, R. F., Heatherton, T. F., Tice, D. M., & Baumeister, B. R. (1994). *Losing Control: How And Why People Fail At Self-regulation* (Vol. 13). San Diego, CA: Academic Press, Inc.
- Blanchard, C. M., Fortier, M., Sweet, S., O’Sullivan, T., Hogg, W., Reid, R. W., et al. (2007). Explaining physical activity levels from a self-efficacy perspective: The physical activity counseling trial. *Annals of Behavioral Medicine, 34*, 323–328. doi: 10.1007/BF02874557.
- Booth, F. W., Roberts, C. K., & Laye, M. J. (2012). Lack of exercise is a major cause of chronic diseases. *Comprehensive Physiology, 2*(2), 1143–1211. doi:10.1002/cphy.c110025
- Carver, C., & Scheier, M. (1982). Control theory: A useful conceptual framework for personality-social, clinical, and health psychology. *Psychological Bulletin, 92*(1), 111–135. doi:10.1037/0033-2909.92.1.111
- Centraal Bureau voor de Statistiek (2016). Standaard Onderwijsindeling 2016. Den Haag/Heerlen: Centraal Bureau voor de Statistiek. Retrieved from: [www.cbs.nl/nl-nl/onze-](http://www.cbs.nl/nl-nl/onze)

SELF-REGULATION STRATEGIES AND EXERCISE

diensten/methoden/classificaties/onderwijs-en-beroepen/standaard-onderwijsindeling--soi--/standaard-onderwijsindeling-2016

Crespo, C. J., Smit, E., Andersen, R. E., Carter-Pokras, O., & Ainsworth, B. E. (2000). Race/Ethnicity, Social Class and Their Relation to Physical Inactivity During Leisure Time: Results from the Third National Health and Nutrition Examination Survey, 1988-1994 Introduction. *American Journal of Preventive Medicine*, *18*(1), 46–53.

doi:10.1016s0749-3797(99)00105-1

De Ridder, D. T. D., De Boer, B. J., Lugtig, P., Bakker, A. B., & Van Hooft, E. A. J. (2011). Not doing bad things is not equivalent to doing the right thing: Distinguishing between inhibitory and initiatory self-control. *Personality and Individual Differences*, *50*(7), 1006–1011. doi:10.1016/j.paid.2011.01.015

Dishman, R. (1994). *Advances in exercise adherence*. IL: Human Kinetics Champaign.

Dishman, R. K., Ickes, W., & Morgan, W. P. (1980). Self-Motivation and Adherence to Habitual Physical Activity. *Journal of Applied Social Psychology*, *10*(2), 115–132.

doi:10.1111/j.1559-1816.1980.tb00697.x

Dishman, R. K., Motl, R. W., Sallis, J. F., Dunn, A. L., Birnbaum, A. S., Welk, G. J., ... Jobe, J. B. (2005). Self-Management Strategies Mediate Self-Efficacy and Physical Activity. *American Journal of Preventive Medicine*, *29*(1), 10–18.

doi:10.1016j.amepre.2005.03.012

Duckworth, A. L., Szabó Gendler, T., & Gross, J. J. (2016). Situational Strategies for Self-Control. *Perspectives on Psychological Science*, *11*(1), 35–55.

doi:10.1177/1745691615623247

Gezondheidsraad. (2017). *Beweegrichtlijnen 2017. Onafhankelijk wetenschappelijk adviesorgaan voor regering en parlement* (Vol. Nr. 2017/0). Retrieved from <https://www.meetinstrumentenzorg.nl/Home/SearchPost>

Gillison, F. B., Standage, M., & Skevington, S. M. (2006). Relationships among adolescents' weight perceptions, exercise goals, exercise motivation, quality of life and leisure-time exercise behaviour: a self-determination theory approach. *Health Education Research*, *21*(6), 836–847. doi:10.1093/her/cy1139

Godin, G. (2011). The Godin-Shephard Leisure-Time Physical Activity Questionnaire. *Health & Fitness Journal of Canada*, *4*(1), 18–22. doi:10.14288/hfjc.v4i1.82

SELF-REGULATION STRATEGIES AND EXERCISE

- Heatherton, T. F., & Ambady, N. (1993). Self-Esteem, Self-Prediction, and Living up to Commitments. In *Self-Esteem* (pp. 131–145). New York: Peunum Press.
doi:10.1007/978-1-4684-8956-9_7
- Jansen, J., Schuit, A. J., & Van Der Lucht, F. (2002). *Tijd voor gezond gedrag Bevordering van gezond gedrag bij specifieke groepen*. Bilthoven: Bohn Stafleu Van Loghum.
- Kemper, H. C. G., & Mechelen, W. V. (1995). Physical fitness and the relationship to physical activity. In H. C. G. Kemper (ed.). *The Amsterdam growth study: a longitudinal analysis of health, fitness and lifestyle*. (HK Sport Science Monograph Series, 6, 135–158). Champaign, IL: Human Kinetics.
- Mahoney, M. J., & Thoresen, C. E. (1972). Behavioral self-control: Power to the person. *Educational Researcher*, 1(10), 5-7. doi:10.3102/0013189X001010005
- Mann, T., De Ridder, D., & Fujita, K. (2013). Self-regulation of health behavior: Social psychological approaches to goal setting and goal striving. *Health Psychology*, 32(5), 487–498. doi:10.1037/a0028533
- Mclachlan, S., & Hagger, M. S. (2010). Associations between motivational orientations and chronically accessible outcomes in leisure-time physical activity: are appearance-related outcomes controlling in nature? *Research Quarterly for Exercise and Sport*, 81(1), 102–107. doi:10.5641/027013610X13352775119871
- Michie, S., Abraham, C., Whittington, C., McAteer, J., & Gupta, S. (2009). Effective techniques in healthy eating and physical activity interventions: A meta-regression. *Health Psychology*, 28(6), 690. doi: 10.1037/a0016136
- Miller, G., Galanter, E., & Pribram, K. (1960). *Plans and the structure of behavior. Inc., New York*. New York, NY, US: Adams Bannister Cox. doi:10.1037/10039-000
- Morris, K. S., McAuley, E., & Motl, R. W. (2008). Self-efficacy and environmental correlates of physical activity among older women and women with multiple sclerosis. *Health Education Research*, 23, 744–752. doi:10.1093/her/cym067.
- Pedersen, B. K. (2019). Which type of exercise keeps you young? *Current Opinion in Clinical Nutrition and Metabolic Care*, 22(2), 167–173.
doi:10.1097/MCO.0000000000000546
- Prodaniuk, T. R., Plotnikoff, R. C., Spence, J. C., & Wilson, P. M. (2006). The influence of self-efficacy and outcome expectations on the relationship between perceived

SELF-REGULATION STRATEGIES AND EXERCISE

- environment and physical activity in the workplace. *The International Journal of Behavioral Nutrition and Physical Activity*, 1, 7–18. doi: 10.1186/1479-5868-1-7.
- Qualtrics. (2005). Qualtrics. Utah. Retrieved from: <https://www.qualtrics.com>
- Rijksinstituut voor Volksgezondheid en Milieu. (2017). *Hoeveel mensen voldoen aan de door de Gezondheidsraad geadviseerde Beweegrichtlijnen 2017?*
- Rijksinstituut voor Volksgezondheid en Milieu. (2020). *Kinderen en COVID-19*. Retrieved from: www.rivm.nl/coronavirus-covid-19/kinderen
- Rovniak, L. S., Anderson, E. S., Winett, R. A., & Stephens, R. S. (2002). *Social Cognitive Determinants of Physical Activity in Young Adults: A Prospective Structural Equation Analysis*. *Annals of Behavioral Medicine*, 24(2):149-56.
doi:10.1207S15324796ABM2402_12
- Sas-Nowosielski, K., & Szopa, S. (2015). Self-regulation strategies used by men and women attending to fitness clubs. *Baltic Journal of Health and Physical Activity*, 7(3), 23–28.
doi:10.29359/BJHPA.07.3.03
- Scheier, M. F., & Carver, C. S. (1988). A model of behavioral self-regulation: Translating intention into action. *Advances in Experimental Social Psychology*, 21, 303–346.
doi:10.1016/S0065-2601(08)60230-0
- Schunk, D. H. (1996). *Self-Evaluation and Self-Regulated Learning*. New York. Retrieved from: www.eric.ed.gov/?id=ED403233
- Schwarzer, R., Luszczynska, A., Ziegelmann, J. P., Scholz, U., & Lippke, S. (2008). Social-cognitive predictors of physical exercise adherence: Three longitudinal studies in rehabilitation. *Health Psychology*, 27, S54–S63.
doi:10.1037/0278-6133.27.1(Suppl.).S54.
- Sniehotta, F. F., Scholz, U., & Schwarzer, R. (2005). Bridging the intention–behaviour gap : Planning, self-efficacy, and action control in the adoption and maintenance of physical exercise. *Psychology and Health*, 20(2), 143–160. doi:10.1080/08870440512331317670
- Stevens, G., Van Dorsselaer, S., Boer, M., De Roos, S., Duinhof, E., Ter Bogt, T., ... De Looze, M. (2018). *Gezondheid en welzijn van jongeren in Nederland*. Utrecht. Retrieved from www.hbsc-nederland.nl

SELF-REGULATION STRATEGIES AND EXERCISE

- Umstattd, M.R., Wilcox, S., Saunders, R., Watkins, K., and Dowda, M. (2008). Self-regulation and physical activity: The relationship in older adults. *American Journal of Health Behavior*, 32(2), 115-124. doi:10.5993/AJHB.32.2.1
- Verbrugge, L. M., Gruber-Baldini, A. L., & Fozard, J. L. (1996). Age Differences and Age Changes in Activities: Baltimore Longitudinal Study of Aging. *The journals of gerontology. Series B, Psychological sciences and social sciences*, 51(1), S30-41. doi:10.1093/geronb/51b.1.s30
- Wallace, J. C., Edwards, B. D., Shull, A., & Finch, D. M. (2009). Examining the consequences in the tendency to suppress and reappraise emotions on task-related job performance. *Human Performance*, 22(1), 23-43. doi:10.1080/08959280802540957
- Zimmerman, B. J. (1986). Becoming a self-regulated learner: Which are the key subprocesses? *Contemporary Educational Psychology*, 11(4), 307–313. doi:10.1016/0361-476X(86)90027-5
- Zimmerman, B. J., & Bandura, A. (1994). Impact of self-regulatory influences on writing course attainment. *American Educational Research Journal*, 31(4), 845–862. doi:10.3102/00028312031004845

Appendix A

Questionnaire

Q1 Informatiebrief onderzoek zelfregulatie

Deze vragenlijst is onderdeel van een onderzoek van de Universiteit Utrecht waarin we onderzoeken hoe jongvolwassenen omgaan met verleidingen en welke strategieën ze gebruiken om hun doelen te bereiken. Dit noemen we ook wel zelfregulatie. We onderzoeken dit in een grote groep jong volwassenen (16-25 jaar). Op deze manier komen we meer te weten over de invloed van zelfregulatie op het bereiken van jouw doelen op de langere termijn en in welke mate zelfregulatie hiermee samenhangt.

Tijdens deze vragenlijst vragen we je om verschillende vragen in te vullen. Het invullen van deze vragenlijst duurt ongeveer 15 minuten. Je kunt er zeker van zijn dat je antwoorden vertrouwelijk en anoniem blijven. De gegevens die we verzamelen aan de hand van de vragenlijst, worden gecodeerd opgeslagen. Alleen onderzoekers van de Universiteit Utrecht die direct betrokken zijn bij dit onderzoek hebben toegang tot deze gegevens en zullen hier vertrouwelijk mee omgaan. De onderzoeksgegevens die gebruikt worden voor data-analyse binnen het onderzoek bevatten geen persoonsgegevens. Indien je vragen hebt met betrekking tot het onderzoek kun je contact opnemen met de hoofdonderzoeker: Jantina Brummelman, j.t.h.brummelman@uu.nl. Bij klachten over het onderzoek kun je terecht bij een onafhankelijke contactpersoon via klachtenfunctionaris-fetcsocwet@uu.nl. Als je deelneemt aan het onderzoek is het van belang dat je kennis neemt van de volgende punten en daarmee instemt:

- Ik ben goed geïnformeerd over het doel en de werkwijze van het onderzoek.
- Mijn deelname aan het onderzoek is volledig vrijwillig.
- Ik kan op ieder moment stoppen met het onderzoek zonder dat dit nadelige gevolgen voor mij heeft.
- Ik heb het recht om mijn persoonsgegevens en verzamelde onderzoeksgegevens te allen tijde te laten verwijderen zonder hier een reden voor te hoeven geven. - De onderzoeksgegevens worden anoniem geanalyseerd.
- Bij publicatie van de data wordt er zorgvuldig op gelet dat de gegevens niet tot individuele personen te herleiden zijn.
- Ik zal de vragenlijsten nauwkeurig en serieus invullen.
- Als ik niet akkoord ga met bovenstaande informatie, worden mijn (persoonlijke) gegevens verwijderd.

- Ik heb de bovenstaande punten goed gelezen en ga hier niet mee akkoord (2)
- Ik heb de bovenstaande punten goed gelezen en ga hier mee akkoord (1)

Skip To: End of Survey If Informatiebrief onderzoek zelfregulatie Deze vragenlijst is onderdeel van een onderzoek van de... = Ik heb de bovenstaande punten goed gelezen en ga hier <u>niet</u> mee akkoord

Q2 Wat is je geslacht?

- Vrouw (1)
- Man (2)
- Anders (3)

Q3 Hoe oud ben je?

▼ 16 (1) ... 25 (10)

SELF-REGULATION STRATEGIES AND EXERCISE

Q4 In welk land ben je geboren?

- Nederland (1)
 - Marokko (2)
 - Turkije (3)
 - Suriname (4)
 - Duitsland (5)
 - België (6)
 - Aruba, Bonaire, Curacao, Saba, St. Eustatius of St. Maarten ("Voormalige Nederlandse Antillen"). (7)
 - In een ander land, namelijk..... (8)
-

Q5 In welk land is je vader geboren?

- Nederland (1)
 - Marokko (2)
 - Turkije (3)
 - Suriname (4)
 - Duitsland (5)
 - België (6)
 - Aruba, Bonaire, Curacao, Saba, St. Eustatius of St. Maarten ("Voormalige Nederlandse Antillen"). (7)
 - In een ander land, namelijk.... (8)
-

- Weet ik niet (9)

Q6 In welk land is je moeder geboren?

- Nederland (1)
 - Marokko (2)
 - Turkije (3)
 - Suriname (4)
 - Duitsland (5)
 - België (6)
 - Aruba, Bonaire, Curacao, Saba, St. Eustatius of St. Maarten ("Voormalige Nederlandse Antillen"). (7)
 - In een ander land, namelijk.... (8)
-

- Weet ik niet (9)

SELF-REGULATION STRATEGIES AND EXERCISE

Q7 Wat is je hoogste voltooide opleiding?

- Basisonderwijs (lager onderwijs, speciaal onderwijs) (1)
- Lager of voorbereidend beroepsonderwijs (zoals vmbo) (2)
- Middelbaar algemeen voortgezet (zoals mavo, mbo-kort, vmbo) (3)
- Middelbaar beroepsonderwijs (zoals mbo-lang, mts, meao) (4)
- Hoger algemeen voorbereid onderwijs (havo) of voorbereidend wetenschappelijk onderwijs (vwo, atheneum, gymnasium) (5)
- Hoger beroepsonderwijs (zoals hts, heao, hbo-v) (6)
- Wetenschappelijk onderwijs (universiteit) (7)
- Anders (8)
- Niet van toepassing (9)

Q22 Wij zijn benieuwd naar wat jij graag zou willen bereiken in de toekomst. Daarmee bedoelen we alles wat je nu nog niet bent (bijvoorbeeld een verpleegkundige met een diploma), wat je nu nog niet hebt (zoals een auto), wat je nu nog niet kan (zoals heel goed voetballen) of wat je nu nog niet doet (zoals gezond eten) maar wat je wel graag zou willen. Wat je wilt zijn, hebben, leren of doen in de toekomst, noemen we een doel.

We willen graag weten wat jouw belangrijkste doel is voor de komende drie maanden. Hieronder staat een lijstje met allerlei doelen. Sommige doelen zullen meer op jou van toepassing zijn dan andere. Vink aan welke doelen voor jou gelden. Je mag zoveel doelen aanvinken als je zelf wilt.

Q23 Sparen voor een lange vakantie

- Dit doel geldt voor mij (1)
- Dit doel geldt niet voor mij (2)

Q24 Vaker op tijd naar bed gaan

- Dit doel geldt voor mij (1)
- Dit doel geldt niet voor mij (2)

Q25 Minder schermtijd

- Dit doel geldt voor mij (1)
- Dit doel geldt niet voor mij (2)

Q26 Vaker sporten

- Dit doel geldt voor mij (1)
- Dit doel geldt niet voor mij (2)

Q27 Mijn huiswerk vaker op tijd afhebben

- Dit doel geldt voor mij (1)
- Dit doel geldt niet voor mij (2)

SELF-REGULATION STRATEGIES AND EXERCISE

Q28 Vaker op tijd komen op school/stage

- Dit doel geldt voor mij (1)
 Dit doel geldt niet voor mij (2)

Q29 Stoppen met roken

- Dit doel geldt voor mij (1)
 Dit doel geldt niet voor mij (2)

Q30 Mijn kamer vaker opruimen

- Dit doel geldt voor mij (1)
 Dit doel geldt niet voor mij (2)

Q31 Afvallen

- Dit doel geldt voor mij (1)
 Dit doel geldt niet voor mij (2)

Q32 Aardiger zijn voor andere mensen

- Dit doel geldt voor mij (1)
 Dit doel geldt niet voor mij (2)

Q33 Minder alcohol drinken

- Dit doel geldt voor mij (1)
 Dit doel geldt niet voor mij (2)

Q34 Minder plastic gebruiken

- Dit doel geldt voor mij (1)
 Dit doel geldt niet voor mij (2)

Q35 Minder vlees eten

- Dit doel geldt voor mij (1)
 Dit doel geldt niet voor mij (2)

Q36 Mijn opleiding afmaken

- Dit doel geldt voor mij (1)
 Dit doel geldt niet voor mij (2)

SELF-REGULATION STRATEGIES AND EXERCISE

Q37 Vaker de fiets pakken of lopen

- Dit doel geldt voor mij (1)
 Dit doel geldt niet voor mij (2)

Q38 Financieel onafhankelijk worden van mijn ouders

- Dit doel geldt voor mij (1)
 Dit doel geldt niet voor mij (2)

Q39 Meer groente en fruit eten

- Dit doel geldt voor mij (1)
 Dit doel geldt niet voor mij (2)

Q40 Schuld aflossen

- Dit doel geldt voor mij (1)
 Dit doel geldt niet voor mij (2)

Q41 Minder energiedrankjes drinken

- Dit doel geldt voor mij (1)
 Dit doel geldt niet voor mij (2)

Q42 Een vervolgopleiding kiezen

- Dit doel geldt voor mij (1)
 Dit doel geldt niet voor mij (2)

Q43 Een betere band met mijn ouders krijgen

- Dit doel geldt voor mij (1)
 Dit doel geldt niet voor mij (2)

Q44 Op mezelf gaan wonen

- Dit doel geldt voor mij (1)
 Dit doel geldt niet voor mij (2)

Q45 Een muziekinstrument leren bespelen

- Dit doel geldt voor mij (1)
 Dit doel geldt niet voor mij (2)

SELF-REGULATION STRATEGIES AND EXERCISE

Q46 Succesvol worden

- Dit doel geldt voor mij (1)
 Dit doel geldt niet voor mij (2)

Q47 Vaker met mijn vrienden afspreken

- Dit doel geldt voor mij (1)
 Dit doel geldt niet voor mij (2)

Q48 Beter worden in mijn sport

- Dit doel geldt voor mij (1)
 Dit doel geldt niet voor mij (2)

Q49 (veel) geld verdienen

- Dit doel geldt voor mij (1)
 Dit doel geldt niet voor mij (2)

Q50 Meer genieten van het leven

- Dit doel geldt voor mij (1)
 Dit doel geldt niet voor mij (2)

Q51 Mijn rijbewijs halen

- Dit doel geldt voor mij (1)
 Dit doel geldt niet voor mij (2)

Q52 Een andere taal leren

- Dit doel geldt voor mij (1)
 Dit doel geldt niet voor mij (2)

Q53 Zorgen voor minder stress

- Dit doel geldt voor mij (1)
 Dit doel geldt niet voor mij (2)

Q54 Meer zelfvertrouwen krijgen

- Dit doel geldt voor mij (1)
 Dit doel geldt niet voor mij (2)

SELF-REGULATION STRATEGIES AND EXERCISE

Q55 Een baan vinden

- Dit doel geldt voor mij (1)
- Dit doel geldt niet voor mij (2)

Q56 Anders, namelijk: (vul niks in als dit niet van toepassing is)

Q57 Geef voor elk gekozen doel aan hoe belangrijk en haalbaar ze zijn voor jou door de slider te verschuiven op de lijn.

Display This Question:

If Sparen voor een lange vakantie = Dit doel geldt voor mij

Q58 Sparen voor een lange vakantie

	Helemaal niet	Heel erg
	0	100
Belangrijk ()		
Haalbaar ()		

Display This Question:

If Vaker op tijd naar bed gaan = Dit doel geldt voor mij

Q59 Vaker op tijd naar bed gaan

	Helemaal niet	Heel erg
	0	100
Belangrijk ()		
Haalbaar ()		

Display This Question:
If Minder schermtijd = Dit doel geldt voor mij

Q60 Minder schermtijd

	Helemaal niet	Hele erg
	0	100
Belangrijk ()		
Haalbaar ()		

Display This Question:
If Vaker sporten = Dit doel geldt voor mij

Q61 Vaker sporten

	Helemaal niet	Heel erg
	0	100
Belangrijk ()		
Haalbaar ()		

Display This Question:
If Mijn huiswerk vaker op tijd afhebben = Dit doel geldt voor mij

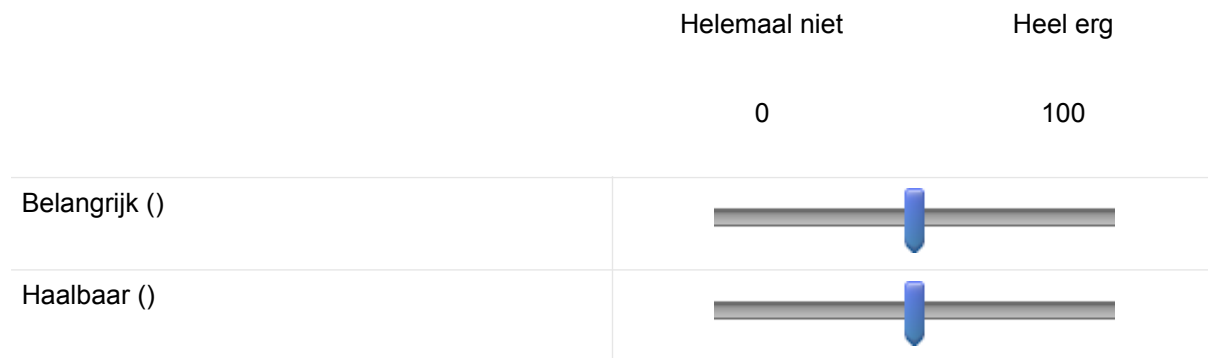
Q62 Mijn huiswerk vaker op tijd af hebben

	Helemaal niet	Heel erg
	0	100
Belangrijk ()		
Haalbaar ()		

Display This Question:

If Vaker op tijd komen op school/stage = Dit doel geldt voor mij

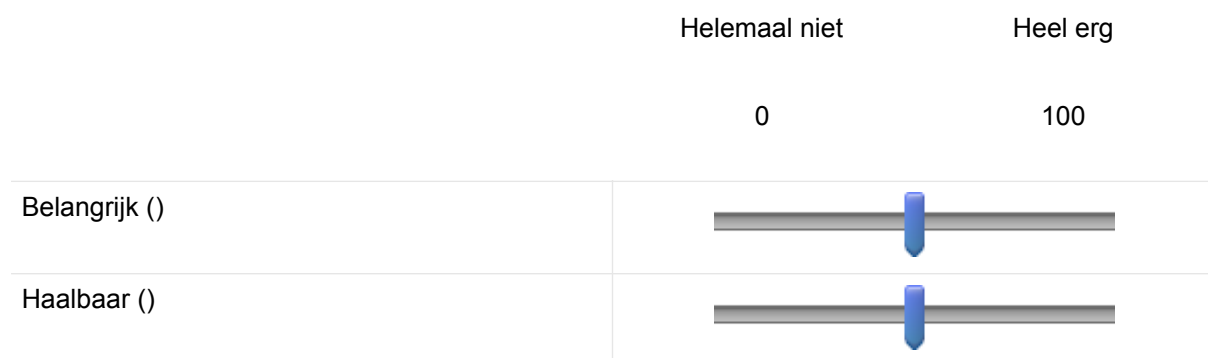
Q63 Vaker op tijd komen op school/stage



Display This Question:

If Stoppen met roken = Dit doel geldt voor mij

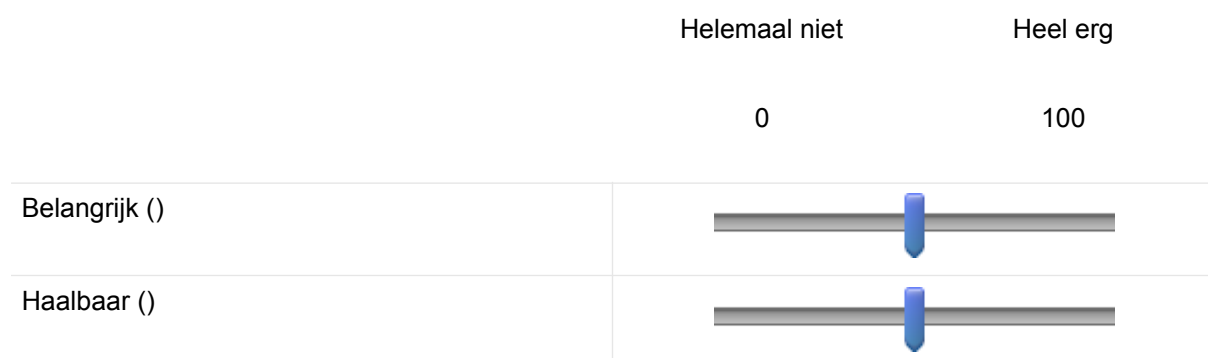
Q64 Stoppen met roken



Display This Question:

If Mijn kamer vaker opruimen = Dit doel geldt voor mij

Q65 Mijn kamer vaker opruimen



Display This Question:
If Afvallen = Dit doel geldt voor mij

Q66 Afvallen

	Helemaal niet	Heel erg
	0	100
Belangrijk ()		
Haalbaar ()		

Display This Question:
If Aardiger zijn voor andere mensen = Dit doel geldt voor mij

Q67 Aardiger zijn voor andere mensen

	Helemaal niet	Heel erg
	0	100
Belangrijk ()		
Haalbaar ()		

Display This Question:
If Minder alcohol drinken = Dit doel geldt voor mij

Q68 Minder alcohol drinken

	Helemaal niet	Heel erg
	0	100
Belangrijk ()		
Haalbaar ()		

Display This Question:
If Minder plastic gebruiken = Dit doel geldt voor mij

Q69 Minder plastic gebruiken

	Helemaal niet	Heel erg
	0	100
Belangrijk ()		
Haalbaar ()		

Display This Question:
If Minder vlees eten = Dit doel geldt voor mij

Q70 Minder vlees eten

	Helemaal niet	Heel erg
	0	100
Belangrijk ()		
Haalbaar ()		

Display This Question:
If Mijn opleiding afmaken = Dit doel geldt voor mij

Q71 Mijn opleiding afmaken

	Helemaal niet	Heel erg
	0	100
Belangrijk ()		
Haalbaar ()		

Display This Question:

If Vaker de fiets pakken of lopen = Dit doel geldt voor mij

Q72 Vaker de fiets pakken of lopen

	Helemaal niet	Heel erg
	0	100
Belangrijk ()		
Haalbaar ()		

Display This Question:

If Financieel onafhankelijk worden van mijn ouders = Dit doel geldt voor mij

Q73 Financieel onafhankelijk worden van mijn ouders

	Helemaal niet	Heel erg
	0	100
Belangrijk ()		
Haalbaar ()		

Display This Question:

If Meer groente en fruit eten = Dit doel geldt voor mij

Q74 Meer groente en fruit eten

	Helemaal niet	Heel erg
	0	100
Belangrijk ()		
Haalbaar ()		

Display This Question:

If Schuld aflossen = Dit doel geldt voor mij

Q75 Schuld aflossen

	Helemaal niet	Heel erg
	0	100
Belangrijk ()		
Haalbaar ()		

Display This Question:

If Minder energiedrankjes drinken = Dit doel geldt voor mij

Q76 Minder energiedrankjes drinken

	Helemaal niet	Heel erg
	0	100
Belangrijk ()		
Haalbaar ()		

Display This Question:

If Een vervolgopleiding kiezen = Dit doel geldt voor mij

Q77 Een vervolgopleiding kiezen

	Helemaal niet	Heel erg
	0	100
Belangrijk ()		
Haalbaar ()		

Display This Question:

If Een betere band met mijn ouders krijgen = Dit doel geldt voor mij

Q78 Een betere band met mijn ouders krijgen

	Helemaal niet	Heel erg
	0	100
Belangrijk ()		
Haalbaar ()		

Display This Question:

If Op mezelf gaan wonen = Dit doel geldt voor mij

Q79 Op mezelf gaan wonen

	Helemaal niet	Heel erg
	0	100
Belangrijk ()		
Haalbaar ()		

Display This Question:

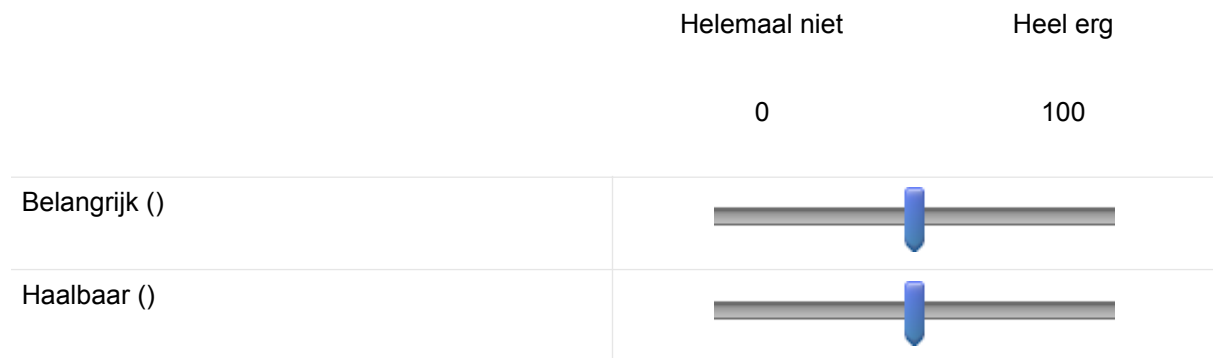
If Een muziekinstrument leren bespelen = Dit doel geldt voor mij

Q80 Een muziekinstrument leren bespelen

	Helemaal niet	Heel erg
	0	100
Belangrijk ()		
Haalbaar ()		

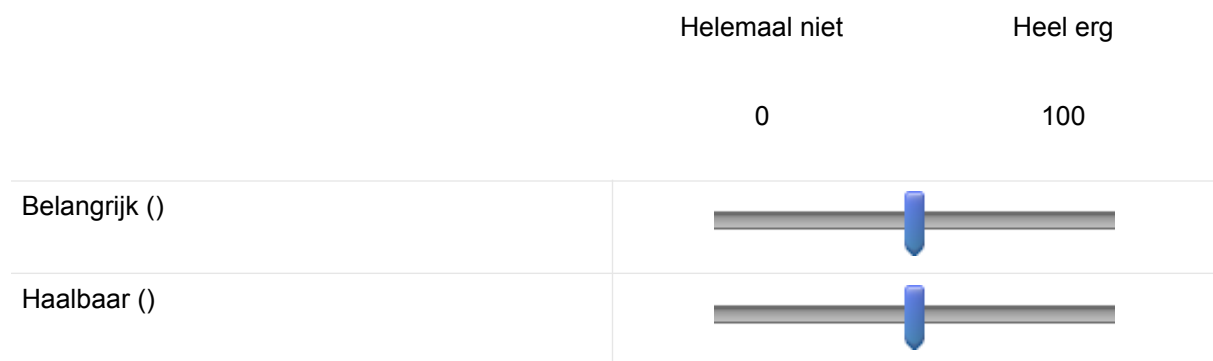
Display This Question:
If Succesvol worden = Dit doel geldt voor mij

Q81 Succesvol worden



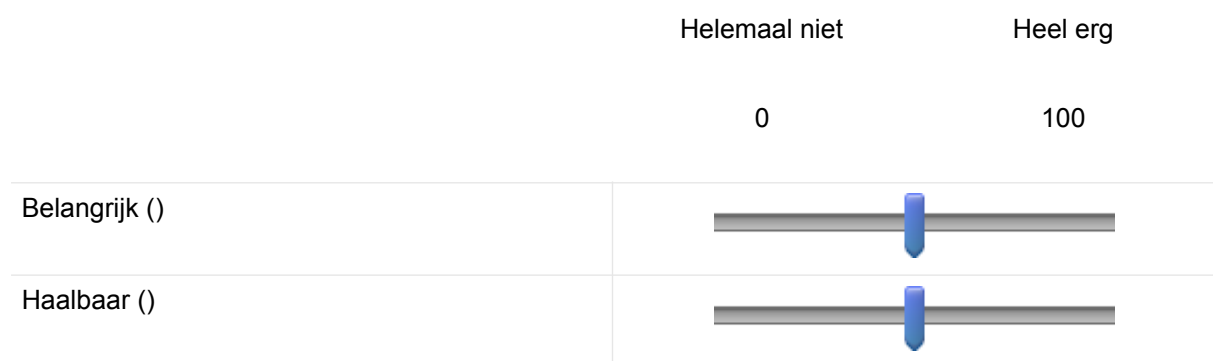
Display This Question:
If Vaker met mijn vrienden afspreken = Dit doel geldt voor mij

Q82 Vaker met mijn vrienden afspreken



Display This Question:
If Beter worden in mijn sport = Dit doel geldt voor mij

Q83 Beter worden in mijn sport



Display This Question:

If (veel) geld verdienen = Dit doel geldt voor mij

Q84 (Veel) geld verdienen

	Helemaal niet	Heel erg
	0	100
Belangrijk ()		
Haalbaar ()		

Display This Question:

If Meer genieten van het leven = Dit doel geldt voor mij

Q85 Meer genieten van het leven

	Helemaal niet	Heel erg
	0	100
Belangrijk ()		
Haalbaar ()		

Display This Question:

If Mijn rijbewijs halen = Dit doel geldt voor mij

Q86 Mijn rijbewijs halen

	Helemaal niet	Heel erg
	0	100
Belangrijk ()		
Haalbaar ()		

Display This Question:
If Een andere taal leren = Dit doel geldt voor mij

Q87 Een andere taal leren

	Helemaal niet	Heel erg
	0	100
Belangrijk ()		
Haalbaar ()		

Display This Question:
If Zorgen voor minder stress = Dit doel geldt voor mij

Q88 Zorgen voor minder stress

	Helemaal niet	Heel erg
	0	100
Belangrijk ()		
Haalbaar ()		

Display This Question:
If Meer zelfvertrouwen krijgen = Dit doel geldt voor mij

Q89 Meer zelfvertrouwen krijgen

	Helemaal niet	Heel erg
	0	100
Belangrijk ()		
Haalbaar ()		

Display This Question:

If Een baan vinden = Dit doel geldt voor mij

Q90 Een baan vinden

	Helemaal niet	Heel erg
	0	100
Belangrijk ()		
Haalbaar ()		

Display This Question:

If If Anders, namelijk: (Text Response Is Not Empty

Q91 $\{Q56/ChoiceTextEntryValue\}$

	Helemaal niet	Heel erg
	0	100
Belangrijk ()		
Haalbaar ()		

Q92 Welke van de onderstaande doelen met betrekking tot sporten ben je op dit moment het meest bezig? Als jouw belangrijkste doel voor de komende drie maanden niet in het lijstje staat, vul dan zelf je doel in.

- Vaker sporten (1)
- Vaker de fiets pakken of lopen (2)
- Beter worden in mijn sport (3)
- Anders, namelijk: (4) _____

SELF-REGULATION STRATEGIES AND EXERCISE

Q93 Jouw belangrijkste doel is: $\{Q92/ChoiceGroup/SelectedChoicesTextEntry\}$ $\{Q102/ChoiceGroup/SelectedChoicesTextEntry\}$ $\{Q113/ChoiceGroup/SelectedChoices\}$

Q94 Wanneer wil je dit doel bereikt hebben?

- Over een paar dagen (1)
- Over één week (2)
- Over een paar weken (3)
- Over een maand (4)
- Over drie maanden (5)
- Dit doel is iets waar ik altijd aan werk (6)

Q95 Hoe denk je over je belangrijkste doel? Geef aan in welke mate je het eens bent met de stellingen door de slider te verschuiven over de lijn.

	Helemaal niet van toepassing	Helemaal van toepassing
	0	100
Ik twijfel of ik dit doel kan bereiken ()		
Het is een kwestie van geluk of ik dit doel ga bereiken ()		
Dit doel wil ik bereiken omdat anderen dat van mij verwachten ()		
Dit is een doel wat ik persoonlijk wil bereiken ()		
De dingen die ik hiervoor moet doen vind ik vervelend ()		

SELF-REGULATION STRATEGIES AND EXERCISE

Q96 Wat doe je nu al om dit doel te bereiken? Geef aan in welke mate je het eens bent met de stellingen door de slider te verschuiven over de lijn.

	Helemaal niet van toepassing	Helemaal van toepassing
	0	100
Ik maak een plan ()		
Ik check of ik goed bezig ben ()		
Ik praat er met anderen over ()		
Ik zoek situaties op die mij helpen bij mijn doel ()		
Ik kijk naar de positieve kanten als het moeilijk is ()		
Ik maak een gewoonte van de dingen die ik daarvoor moet doen ()		
Ik houd vol als het moeilijk is ()		
Ik onderdruk de neiging om af te haken ()		
Ik weet wat ik moet doen, maar ik stel het steeds uit ()		
Ik beloon mezelf als ik een stap dichterbij mijn doel ben ()		

Q97 Doe je nog iets anders om dit doel te bereiken? (vul niks in als dit niet van toepassing is)

Q98 De volgende vragen zullen gaan over sporten.

Gedurende een typische **7-daagse** periode (een week), hoe veel keer doe je gemiddeld de volgende sporten voor **meer dan 15 minuten** tijdens je vrije tijd?

Vul het juiste getal in bij de onderstaande vragen.

*Voorbeeld: Wanneer je gemiddeld 3 keer per week 30 minuten aan joggen doet, 1 keer per week 15 minuten dansen en 2 keer per week 60 minuten yoga, dan vul je in bij **zware inspanning** 3 in, bij **gemiddelde inspanning** 0 en bij **milde inspanning** 2.*

SELF-REGULATION STRATEGIES AND EXERCISE

Q99 Zware inspanning (hart klopt snel)

(Bijvoorbeeld: rennen, joggen, hockey, rugby, voetbal, squash, basketbal, langlaufen, judo, rolschaatsen, inspannend zwemmen en inspannend fietsen)

Q100 Gemiddelde inspanning (niet vermoeiend)

(Bijvoorbeeld: snelwandelen, honkbal, tennis, rustig fietsen, volleybal, badminton, rustig zwemmen, alpine skiën of dansen)

Q101 Milde inspanning (minimale moeite)

(Bijvoorbeeld: yoga, boogschieten, vissen vanaf de oever, bowlen, golf zonder buggy, sneeuwscooteren, rustig wandelen)

Appendix B

Table 3 - Pearson correlation matrix of Weekly Exercise Score, intrinsic and extrinsic motivation, and self-regulation strategies

Variables	1	2	3	4	5	6	7	8	9	10	11	12
1. Weekly Exercise Score	-	.12	.16	.30*	.26	.29*	.23	.56**	.13	-.27	.36*	.20
2. Intrinsic motivation	.12	-	.08	.25	.26	.27	.17	.40**	.12	-.30*	.42**	.15
3. Situation selection	.16	.08	-	.63**	.24	.16	.37**	.42**	.21	-.09	.25	.19
4. Cognitive change	.30*	.25	.63**	-	.02	.21	.31*	.47**	.31*	-.07	.30*	.16
5. Prospection	.26	.26	.24	.02	-	.01	.14	.29*	.35*	-.06	.18	.21
6. Automatisation	.29*	.27	.16	.21	.01	-	.50**	.29*	.12	-.46**	.46**	.19
7. Inhibition	.23	.17	.37**	.31*	.14	.50**	-	.30*	.29*	-.46**	.64**	.19
8. Self-monitoring	.56**	.40**	.42**	.47**	.29*	.29*	.30*	-	.32*	-.33*	.43**	.23
9. Seeking social support	.13	.12	.21	.31*	.35*	.12	.29*	.32*	-	-.08	.24	.11
10. Procrastination	-.27	-.30*	-.09	-.07	-.05	-.56**	-.56**	-.33*	-.08	-	-.56**	-.10
11. Persistence	.36*	.42**	.25	.30*	.18	.46**	.64**	.42**	.24	-.56**	-	.19
12. Self-reward	.20	.15	.19	.16	.21	.19	.19	.23	.11	-.10	.19	-

* $p < .05$, ** $p < .01$