

Master's Thesis

**Dispositional Optimism and Exercise Behaviour:
The Moderating Role of Trait Self-Control**

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Abstract

Extensive research has shown that dispositional optimism has a positive impact on physical and psychological health and well-being. The present study looked at the relationship between dispositional optimism and one health-related behaviour in particular, namely exercise behaviour. Enough exercise is important for several health and well-being reasons, leaving people with good intentions to exercise, but the majority do not manage to follow through. People face daily distractors and temptations, which act as obstacles in their pursuit of a healthier lifestyle. A trait that helps combat this dilemma is self-control. The first hypothesis was that dispositional optimism would be positively associated with exercise behaviour; and the second was that trait self-control would moderate this relationship. Previous research on the topic has been somewhat mixed, hence the addition of a moderating variable to potentially help explain inconsistent findings. Data was collected using a survey study and participants were recruited via the network of the researcher. The final sample consisted of 283 participants. Results revealed no association between dispositional optimism and exercise behaviour in this study, and no moderating effect of trait self-control, which left both hypotheses unsupported. However, a significant positive association was found between trait self-control and exercise. These results raise questions regarding the effects of optimism on specific health-related behaviours, implying that more research is required in this field. Though somewhat indirectly, the findings also add to the large pool of research on the positive impact of trait self-control on behaviour.

Keywords: dispositional optimism, trait self-control, exercise behaviour, physical activity

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Introduction

The glass is half full, or it is half empty – a well-known metaphor to describe people's general expectations of whether good or bad things will happen, optimism or pessimism. It is said that optimists are opportunists – they are more hopeful about the future, more promotion focused, and they possess better coping strategies (Norem, 2013). Dispositional optimism can be defined as the generalized expectation that positive outcomes will occur across different life domains (Khallad, 2013) and it is considered a stable personality attribute that has implications for various types of behaviour (Scheier & Carver, 2018). Pessimists, on the other hand, are oriented more negatively and are more prevention focused. This does not imply that optimism-pessimism is particularly good or bad, it simply helps distinguish whether people are a bit more like Superman, possessing more optimistic tendencies, or like Batman, with more pessimistic tendencies – while both remain heroes. In the context of this paper, however, I will not be referring to participants as optimistic versus pessimistic, but rather as having higher versus lower levels of optimism.

Research on optimism began largely in health contexts, leading to findings of positive relationships between optimism and indicators of better physical and psychological health (Carver & Scheier, 2014; Scheier & Carver, 2018). In a review by Scheier and Carver (2018), the main pioneers of dispositional optimism, three decades worth of research on the effects of optimism on physical health are discussed, as well as the potential underlying mechanisms of this relation. Some of these mechanisms include people's attributional style, the way in which they explain the causes of prior events in their lives, and the strategies that they use to handle stress (coping strategies). Ample research has shown the positive effects of dispositional optimism on life satisfaction and general well-being (Conversano et al., 2010; Khallad, 2013; Oriol et al., 2020; Reivich, 2010; Scheier & Carver, 1987; Scheier & Carver, 2018; Yu & Luo, 2018), as well as on healthy ageing among older people (Steptoe et al., 2006).

The above-mentioned constructs are all general measures of health and not a lot of research focuses on the effects of optimism on specific behaviours within the health domain, for example physical exercise. There is an array of research on the benefits of exercising because the consequences of physical inactivity are so severe. Studies have shown that physical inactivity grossly increases health risks comparable to smoking, obesity, hypertension, and a shortened lifespan (Penedo & Dahn, 2005). The vast benefits of physical activity on health and disease can be grouped into physical and mental health benefits. Penedo and Dahn (2005) list several in each group, starting with physical benefits which include

decreased risk of cardiovascular disease, obesity, diabetes, cancer, arthritis, as well as some chronic diseases. Physical activity also boosts emotional well-being, as it improves mood, reduces symptoms of anxiety and depression, alleviates anger and tension, and helps combat stress and negative affect. This highlights the importance of regular exercise and supports the notion that it falls under one of the many health-related behaviours. It is the outcome variable of interest in this study, as it is specific and easily measurable.

There is limited research in the field of optimism that looks at its effect on specific health-related concepts, like exercise, and the few studies that do investigate this relationship have found contradictory results (Boehm, Williams, Rimm, Ryff, & Kubzansky, 2012; Fontaine & Shaw, 1995; Kavussanu & McAuley, 1995). The aim of the present study is to gain a better understanding of the potential influence of optimism on our willingness to exercise, as well as to help close the gap in the literature regarding the inconsistent findings. In doing so, a moderator variable was added in hopes of clarifying any potential inconsistencies, namely trait self-control.

Theoretical Background

Dispositional Optimism and Exercise Behaviour

People may exercise for multiple reasons, whether it be to lose weight, to get stronger, for the adrenaline-rich post-exercise feeling, or simply to foster routine and balance in their lives. No matter the reason behind people's decision to exercise, it has been well documented that exercise has both physical and psychological benefits (Penedo & Dahn, 2005). The Centers for Disease Control (CDC) in the US recommends that healthy adults perform at least 150 minutes of moderate-intensity aerobic exercise per week (Helfer, Elhai, & Geers, 2015) in order to reap the mental and physical benefits of exercising. The NHS in the UK similarly recommends 150 minutes of moderate intensity activity per week or 75 minutes of vigorous intensity activity. Additionally, they suggest spreading exercise evenly over 4 to 5 days per week, and reducing time spent sitting or lying down and breaking up long periods of inactivity (National Health Service, 2021). However, less than half of adults, at least in the US, meet these recommended amounts of physical exercise (Haskell et al., 2007), which has detrimental effects on long-term health. This has led to the extensive research on the potential determinants of exercise, including attitude (Silverman & Subramaniam, 1999), hope and self-efficacy (Anderson & Feldman, 2020), positive affect expectancy (Helfer et al., 2014), optimism (Kavussanu & McAuley, 1995), and self-control (Gillebaart & Adriaanse, 2017),

among others. One of the least researched determinants of exercise behaviour is dispositional optimism. Determining whether high levels of optimism can predict physical exercise can lead to strategies to make those individuals low in optimism more optimistic, which could in turn increase their exercise engagement.

Due to the fact that optimism is the expectation of positive future outcomes, it might then be logical to assume that people higher in optimism might exercise more frequently, because they expect good outcomes from it – whether those may be long- or short-term. A positive short-term outcome of exercising could be the good feeling following physical activity. This post-exercise thrill is caused by dopamine, noradrenaline, and serotonin – the three main neurotransmitters regulated by exercise (Lin & Kuo, 2013). An example of long-term good outcomes of exercise is to maintain or improve personal fitness that helps reduce obesity and the risk of chronic health conditions (Haskell et al., 2007; Penedo & Dahn, 2005). Regardless of the precise reason behind people’s exercise motivations, it is the attitude of having positive expectations for endeavours that differentiate between people high versus low in optimism and (perhaps) also allow them to exercise more frequently.

An underlying mechanism of optimism is the coping strategies people choose to implement during situations that hinder their goal-attainment. Those that are highly optimistic make use of “active, approach-oriented coping styles, which directly address the problem being confronted or alter thoughts about the stressor in a positive way” (Scheier & Carver, 2018, p. 1088). The positive expectancies held by people high in optimism serve as a safeguard against hardships and make them more willing to invest more efforts in solving goal-related problems. On the other hand, low optimism is associated with an avoidant coping style in the form of mental disengagement and denial. People low in optimism will try to deny or prevent the problem or stressor and end up disengaging from goal-directed efforts (Norem, 2013; Scheier & Carver, 1987). With that said, problems that arise in daily life (e.g., choosing the couch over going for a run) should have fewer consequences and be less disruptive to those with higher optimism than to those with lower optimism (Scheier & Carver, 1987), leading them to engage in exercise more frequently. In short, optimists persevere when faced with difficulties and are goal-driven, and exercise is a goal-directed activity (Anderson & Feldman, 2020) leading to the assumption that having high optimism will result in engaging in more exercise, which represents the bedrock of the present study.

The few studies that have researched this specific relationship have found somewhat mixed results (Anderson & Feldman, 2020). A study by Kavussanu and McAuley (1995)

investigated the potential effects of exercise on optimism. Their study revealed that highly active individuals were also significantly more optimistic (and less pessimistic) than inactive or low active individuals. In a study where these two variables are flipped around, researchers had analysed the data of 982 participants drawn from a survey and found a relationship between higher optimism and self-reported frequent exercise engagement (Boehm, Williams, Rimm, Ryff, & Kubzansky, 2013). However, no standardized effect size was reported, and the effect appeared to be rather small, since around 74% of people with low optimism and 80% of people with high optimism both reported regular exercise. In another study, it was found that self-efficacy predicted adherence to an eight-week exercise regime, but no relationship was found between adherence to the exercise regime and dispositional optimism (Fontaine & Shaw, 1995). These conflicting results regarding the relationship between optimism and exercise behaviour demand more clarity, which I hope to provide in the present research study with the help of trait self-control as a moderator variable.

The Moderating Role of Trait Self-Control

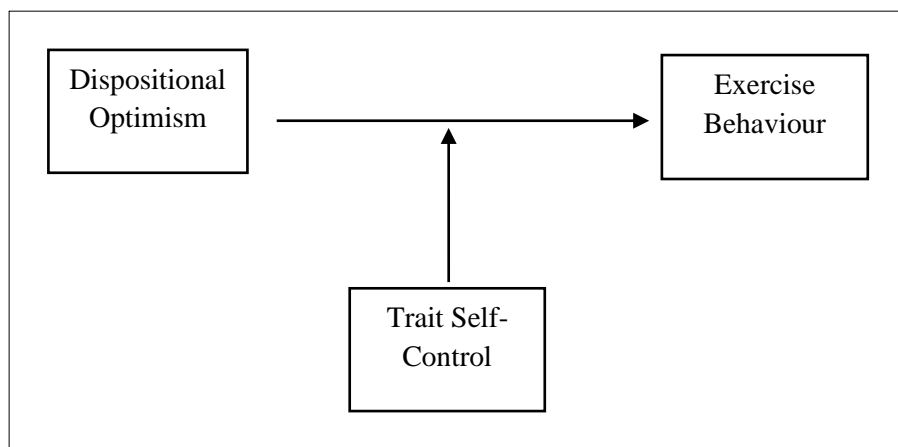
As mentioned above, exercise has been shown to be an important contributor to several health and well-being outcomes (Gillebaart & Adriaanse, 2017), and most individuals intend to exercise, yet many fail to do so due to conflicting temptations and impulses. Temptations are extremely prevalent in our everyday environment and can manifest themselves to conflict with our personal goals, so much so that indulging in them can lead to goal failure. A trait that can help combat this is self-control, the innate ability to interrupt or override these undesired impulses and to resist acting on them (Hofmann, Luhmann, Fischer, Vohs, & Baumeister, 2014). In addition to this effortful inhibition of impulses, it is said that people high in trait self-control also benefit from adaptive routines or habits that occur on an automatic level, essentially acting as a shield or buffer against daily goal-conflicting dilemmas. Having high self-control helps steer behaviour away from goal-conflicting activities and towards long-term goal achievement by means of effortful inhibition and/or by having good habits. It is a characteristic conducive to a healthy and successful life as it promotes desirable behaviours (Hagger et al., 2019; de Ridder et al., 2012).

Given that higher trait self-control has been associated with managing conflicting goals and provides resources to help do the right thing (Hofmann et al., 2014), this study places self-control in a moderating role, essentially boosting the relationship between optimism and exercise behaviour. In other words, higher levels of optimism predict more engagement in exercise, and this effect will be more prominent for individuals with higher

self-control, because they manage temptations more successfully leading them to engage in exercise more ‘easily’. In essence, optimists might intend to exercise more due to their good expectations of it, but it is the adaptive/habitual component of trait self-control that will set the frequent exercisers apart from the rest. This portrays optimism as the expectation and intention to exercise frequently, and self-control as the trait that helps engage in exercise more easily. Figure 1 below illustrates the model for the present research study.

Figure 1

Possible Moderator of Dispositional Optimism and Exercise Behaviour



Note. Proposed model of relationships between dispositional optimism, exercise behaviour, and trait self-control.

Due to the importance of optimism and self-control for the understanding of human behaviour and well-being, knowing if and which differences exist among people with respect to each trait could have important implications for further research in both fields. There may also be some practical implications, for example, enhancing improvement strategies for both traits can help people engage more in healthy behaviours, which in turn sustains general well-being. For clarification purposes, the terms optimism and dispositional optimism will be used interchangeably, as well as self-control and trait self-control. The same goes for exercise behaviour, exercise engagement, and physical exercise.

Research Question and Hypotheses

In light of the research findings mentioned thus far, the present study aims to investigate dispositional optimism in relation to exercise behaviour among the general population of adults, in hopes of adding to the small pool of literature on the topic. The present study will attempt to answer the question whether trait self-control moderates the

relationship between dispositional optimism and exercise behaviour by testing two main hypotheses.

The hypotheses under consideration are as follows:

1. Dispositional optimism is positively associated with exercise behaviour.
2. The relationship between dispositional optimism and exercise behaviour is stronger for participants with high (vs. low) trait self-control.

Method

The present study has a cross-sectional, between-subjects design in the form of an online survey study.

Participants and Procedure

A power analysis was done preceding data collection to estimate the required sample size of the study. Due to the specific combination of variables of interest in this study, there was no effect size expected based on theoretical predictions or previous research. The estimated effect size for the power analysis was therefore set at a minimal level, namely a small effect ($f^2 = .02$; Cohen, 1988). G*Power, a free software used to calculate statistical power (Faul, Erdfelder, Buchner, & Lang, 2009), was used for the power analysis of this study. Based on a small effect size ($f^2 = .02$), an alpha level of .05, power at 0.8, and 3 predictors, G*Power calculated a total required sample size of 550. However, due to limited resources, data collection was stopped after a period of two weeks (Lakens, 2022) and yielded a final sample size of 283 participants. A sensitivity analysis using G*Power revealed that the sample of 283 participants allowed me to find a small to medium effect size ($f^2 = .04$) with 80% power.

Participants were recruited from the personal network of the researcher via various social media platforms using the snowball sampling technique, and they received no compensation for their participation. Data collection lasted for a period of two weeks in March 2022. At the start of the questionnaire, participants were informed about the purpose of the study and ensured that their responses were completely anonymous. They then provided their explicit informed consent before proceeding with the survey and answering questions related to dispositional optimism, exercise behaviour, trait self-control, and some demographic information. Ethical approval was obtained from the Faculty Ethics Review Board (FERB) of Utrecht University before data collection began.

The original sample consisted of 347 participants, after which 64 were excluded for not having sufficiently completed the questionnaire, either by not finishing, having missing entries, or entering invalid answers. This resulted in a final sample size of 283 participants, of which 129 (45.6%) were male, 152 (53.7%) were female, and 2 people (0.7%) preferred not to say. The average age across the entire sample was 42 years ($SD = 13.36$), with a minimum of 19 years and a maximum of 81 years. There were over 30 different nationalities, with the majority being from South Africa, the Netherlands, Germany, or the UK. Full details about the sample demographics are reported in Table 1.

Measures

The survey used for data collection was created in Qualtrics and presented to participants online using an anonymous link. In this study, three main variables were measured: dispositional optimism, exercise behaviour, and trait self-control – in that order.

Dispositional Optimism

Dispositional optimism, the first independent variable, was measured using the Revised Life Orientation Test (LOT-R; Scheier, Carver, & Bridges, 1994), which has been shown to be a validated scale (Scheier & Carver, 1987). This scale consists of 10 items in total. Items 2, 5, 6, and 8 are filler items, three items (1, 4, 10) are phrased positively for optimism (e.g., “In certain times, I usually expect the best”), and three items are negatively phrased (reverse-scored) describing pessimism (e.g., “I hardly ever expect things to go my way”). Participants indicated their agreement (or disagreement) by using a 5-point scale ranging from 1 = *strongly disagree* to 5 = *strongly agree* (Khallad, 2013).

Exercise Behaviour

The dependent variable, exercise behaviour, was measured using two questions based on those used by Gillebaart and Adriaanse (2017). The first question asked how many times per week participants exercised in the 3 months prior to taking part in the study – with 4 answer options. The second question assessed the number of minutes participants reported to have exercised in the week prior to the study. A control question asked whether participants were pursuing any exercise goals at the time of the questionnaire.

Trait Self-Control

Trait self-control, the second independent variable, was measured using the Brief Trait Self-Control Scale (Gillebaart & Adriaanse, 2017; Tangney et al., 2004), which consists of 13

items, such as “I am good at resisting temptation” and “I refuse things that are bad for me”. Responses to these statements also had to be given on 5-point scales (1 = *not at all like me* and 5 = *very much like me*). All items except 1, 6, 8, and 11 are reverse keyed. The demographic variables included gender, age in years, and nationality, and were used as control variables in the analyses. See the Appendix for the full questionnaire.

Data Analysis

The data was retrieved from Qualtrics and exported to the Statistical Program for Social Sciences (SPSS 24) for analysis. The hypotheses were assessed using correlation analyses and regression analyses to closely examine the link between dispositional optimism and exercise engagement.

Results

Descriptive Statistics

The descriptive statistics of the variables gender, age, nationality, frequency of exercise, and exercise goal can all be found in Table 1. The means and standard deviations of dispositional optimism, trait self-control, minutes of exercise, frequency of exercise, exercise goal, gender, and age can be found in Table 2. Among participants that reported pursuing an exercise goal, goals ranged from keeping fit in general to being able to run a marathon. Cronbach’s alpha (bold numbers in Table 2) for both the Revised Life Orientation Test (LOT-R) and the Brief Trait Self-Control Scale were above 0.70, indicating good internal consistency. All predictor variables were mean centred prior to analyses (Aiken & West, 1991).

Pearson correlations and Spearman correlations were computed to assess the relationships between dispositional optimism and exercise behaviour with trait self-control, as well as with exercise goal, gender, and age. All correlations are presented in Table 2. Minutes of exercise and frequency of exercise appeared to be a good measure of exercise behaviour, because they correlated significantly with one another, which was similarly observed by Gillebaart and Adriaanse (2017) in their own research. Dispositional optimism did not significantly correlate with minutes of exercise in the past week, nor with frequency of exercise per week in the preceding 3 months. Even though these results already provide an indication for the lack of support for Hypothesis 1, further analysis was needed.

Hypothesis Tests

Both hypotheses were tested using Ordinary Least Squares (OLS) regression analyses, with minutes of exercise in the preceding week and frequency of exercise in the preceding three months as dependent variables. Three models were tested per outcome variable. Model 1 contained the main effect of dispositional optimism, and Model 2 contained the main effects of both dispositional optimism and trait self-control. In Model 3, the interaction of the two variables was added. The complete results are presented in Tables 3 for minutes of exercise and Table 4 for frequency of exercise.

Model 1 in Table 3 and Table 4 illustrates that the regression analyses showed no significant effect of optimism on either measure of exercise behaviour – minutes of exercise or frequency of exercise. This rendered the first hypothesis, that dispositional optimism would be positively associated with exercise behaviour, unsupported. The second hypothesis, that the relationship between dispositional optimism and exercise behaviour would be stronger for participants with high (vs. low) trait self-control, was also not supported. This is because the effect of the interaction variable was insignificant for both measures of exercise behaviour – minutes of exercise (Model 3, Table 3) and frequency of exercise (Model 3, Table 4). Based on these results, dispositional optimism does not appear to be a predictor of exercise behaviour in this study.

Additional Findings

Interestingly, trait self-control correlated with both measures of exercise behaviour, and the regression analysis showed a significant effect of self-control on frequency of exercise in the preceding 3 months (Model 2, Table 4). There also appeared to be a link between self-control and minutes of exercise in the regression analysis (Model 2, Table 3), though this effect was not significant ($p > .05$). A linear regression analysis with only trait self-control as the predictor variable showed that it significantly predicted both measures of exercise, which is in line with the correlation results. When observing the standardized regression coefficients in Tables 3 and 4, beta is larger for trait self-control than for dispositional optimism in every model containing both variables as predictors. This provides support for the notion that in this study trait self-control is a stronger predictor of exercise behaviour than dispositional optimism.

Discussion

The first hypothesis, that dispositional optimism would be positively related to exercise behaviour, was not supported. There was no correlation between optimism and either measure of exercise behaviour. Also, the second hypothesis, that the relationship between dispositional optimism and exercise behaviour will be stronger for participants with higher trait self-control, was unsupported, because the linear regression results revealed no interaction effect of trait self-control. Dispositional optimism did not appear to predict people's tendency to exercise, however, trait self-control did.

Theoretical Implications

The results from this study seem to match previous literature in two ways. Firstly, literature findings between optimism and physical activity have been somewhat mixed – some studies have found support while others have not. For example, as mentioned previously, a study by Kavussanu and McAuley (1995) found that highly active individuals (those that exercise a lot) were also significantly more optimistic than inactive or low active individuals. Another study found a relationship between higher optimism and self-reported exercise engagement (Boehm, Williams, Rimm, Ryff, & Kubzansky, 2012), however, the effect appeared to be very small. In another study, it was found that self-efficacy predicted adherence to a two-month exercise regime, but the same was not found for optimism (Fontaine & Shaw, 1995). The present study also found no support for any effect of optimism on physical activity; therefore, it contributes to the non-significant findings of research on this topic. Secondly, findings from the current study are also in line with previous research on self-control and physical exercise, which has been well documented and much more conclusive in showing that self-control predicts better exercise engagement (De Ridder et al., 2012; Gillebaart & Adriaanse, 2017; Hagger et al., 2019).

There are a few explanations for the lack of support for the relationship between dispositional optimism and exercise behaviour. First and foremost, perhaps it is simply not a strong enough predictor of people's tendency to exercise and that other constructs predict it better – for example, self-control, hope, and self-efficacy. Self-control appears to be a stronger predictor of exercise behaviour in the present study, as well as in multiple previous works. For example, Gillebaart and Adriaanse (2017) found that trait self-control predicted exercise behaviour, and this association was mediated by exercise habits. In contrast to optimism, self-control requires an active self, one that engages in behaviour directed at

attaining personal goals. Whether seen as effortful inhibition of impulses or as effortless adaptive routines that manifest as habits – self-control embodies goal-directed agency, and it represents the bridge between intention and behaviour.

Furthermore, a meta-analysis by De Ridder and colleagues (2012) revealed that some of the strongest effects of self-control on behaviour were linked to automatic behaviours, like forming habits. They mention school and work performance, because effective performance in these domains depend to a large extent on a steady and regular work ethic. This finding can also be transferred to physical exercise because exercising (for most people) is a habitual act – like seen in the study by Gillebaart and Adriaanse (2017) among participants with gym memberships. Another study by Hagger and colleagues (2019) showed that trait self-control was a consistent correlate of health behaviours, including physical exercise. The effect sizes in their study were small, which led them to suggest that people's beliefs in whether self-control is limited or not might play a role in the strength of its effect on health behaviours. Future research could include a measure of individual's beliefs about self-control as a limited or unlimited capacity and examine its effect on the relationship between self-control and different health behaviours.

In addition to self-control, also hope and self-efficacy predict exercise engagement. In a study by Anderson and Feldman (2020) they examined the relationship between hope and physical exercise while controlling for optimism and exercise self-efficacy, among others. They found that hope was a better predictor of exercise than optimism was. Since optimism is the expectancy of positive future outcomes regardless of one's actions, it contrasts with hope because hope involves personal planning and motivation (Snyder, 2002). This has led researchers to suggest that, in highly controllable situations requiring active engagement, hope may be a stronger predictor of outcomes than optimism (Rand, Martin, & Shea, 2011). This factor of personal involvement and agency also links to self-efficacy, people's belief in their ability to execute behaviour that is needed to attain a desired outcome. Indeed, Fontaine and Shaw (1995) found that self-efficacy predicted adherence to a two-month exercise regime, but the same was not found for optimism. This may be because optimism, like self-efficacy, involves positive expectancies but it lacks agency. These studies demonstrate that other constructs, such as self-control, hope and self-efficacy, predict exercise behaviour better than optimism, making them more worthwhile to study in future research endeavours.

A second possible explanation for the lack of support for the hypotheses, is that the scale used to measure optimism is very generalized, but exercising is a very specific activity

or goal. Anderson & Feldman (2020) found in their study that exercise goal-specific hope was the significant predictor of physical exercise, but not general hope. Scheier and Carver (1985) state that optimistic “positive expectations are not limited to a particular behavioural domain” (p. 220), meaning that no goal-specific measure for optimism has been used, or even created. Optimism is therefore a very generalized concept (Carver & Scheier, 2002) and the scale used to measure optimism, the LOT-R, has no goal-specific counterpart. This provides one possible explanation for the lack of support for the hypotheses, since a measure of general optimism was used to predict a very specific behaviour, namely physical exercise. This could be why previous research has found positive effects of optimism on life satisfaction and general physical health (Conversano et al., 2010; Khallad, 2013; Oriol et al., 2020; Reivich, 2010; Scheier & Carver, 1987; Scheier & Carver, 2018; Yu & Luo, 2018), but not per se on dieting or exercising. In future, a domain- or goal-specific measure of dispositional optimism could be developed to have a better chance of predicting specific health behaviours.

To sum up, results from previous research on the relationship between optimism and health-related behaviours have been somewhat mixed – a hit-and-miss if you will – and the results in this study can be seen as another ‘miss’. This ties together with the conclusion that dispositional optimism is simply not a good enough predictor of exercise engagement, and that other constructs, like trait of self-control, may be a better fit. Additionally, the LOT-R that measure general dispositional optimism may be missing a domain-specific counterpart to measure goal-specific optimism, which future research could explore.

Practical Implications

There are some practical implications when considering the results of this study. Knowing the exact predictors of exercise behaviour can help target strategies to improve them. For example, people with innately high trait self-control may not need any help in motivating themselves to exercise, though people with low self-control do. Therefore, strategies to help improve individual’s self-control might boost their will to exercise, such as implementing habits and adaptive routines. Doing so can help people reap the long-term benefits of exercising and developing personal adaptive routines might also be transferable to other health-promoting behaviours. More broadly, the results of this study help us better understand the drivers behind engaging in physical activity and knowing that self-control appears to be a better predictor than optimism can lead to more directed initiatives to help improve it.

Limitations and Future Research

There are some limitations to this study that need to be taken into account when interpreting the results. Firstly, the two questions used to measure exercise behaviour need some attention. Statistically, minutes of exercise and frequency of exercise correlated significantly (as seen in Table 2) showing them to be a good measure of exercise. However, one asks for *minutes* of exercise in the *week* before the study, and the other asks for *frequency* of exercise per week in the *3 months* before the study. This might be problematic in representing people's consistency of physical activity over time. Especially since some participants indicated in the comments section that they usually exercise a lot, and therefore selected the 'more than twice a week' option for the question about frequency of exercise in the past 3 months; however, for personal reasons could not exercise in the week before the study and had to indicate zero for that question. Some of the 'personal reasons' mentioned included injury, sickness, or being away on holiday. A more extensive measure of exercise behaviour may have been better to capture participants' usual physical exercise pattern. For example, an additional question could have asked people to indicate how many minutes they exercised per week (on average) in the 3 months prior to the study. Future research could explore this.

Secondly, the type of sample in this study is a convenience sample. One major problem with this type of sampling technique is the limited ability to generalize findings to the larger population. A convenience sample might either under- or overrepresent a given population, making results less reliable. Participants in this study were sampled via various social media platforms, by sharing the survey link with friends, family, and colleagues. The problem with this aspect of convenience sampling is that the network of the sampler is small and perhaps somewhat biased. For example, people may choose to click the survey link and participate in the study based on how well they know the sampler, not because they are truly interested in contributing to the research. This in turn may lead to people answering in a more socially desirable way rather than truthfully to portray themselves more positively in accordance with social expectations. This in itself is a general problem with self-report measures – no matter how much the anonymity of participation is emphasised. An example of a socially desirable way to respond in the present study might be to exaggerate the amount of exercise one does, or to rate the optimism and self-control scales higher than one truly feels. This also provides an example of demand characteristics, which would have swayed the results in favour of the hypotheses. Though I do not believe that response biases were much

of a problem in this study, since there were not many, if any, extreme answers on any of the questions or measures.

Another limitation in this study is the small sample size, primarily due to resource constraints. Conventionally, 283 participants may not be a small sample size, however, for social sciences it is. The power analysis done before the start of data collection specified a required sample size of 550, based on a small effect size – which is traditionally expected in social sciences. Had the required sample size been reached, the outcome of this study may have been different, though this is difficult to know for sure. The resource constraints specific to this study were two-fold, the lack of time (Lakens, 2022) and a limited sampling network. The sampling timeframe only lasted for a period of two weeks, and sampling was done using the network of the researcher (myself). The sample size could have been larger, provided a longer data collection timeframe was possible and/or more people were able to do sampling for the study, essentially expanding the network. Although these resource constraints are very common and justified (Lakens, 2022), they do pose a problem for the results of this study in the form of a smaller-than-ideal sample size.

Conclusion

In conclusion, it cannot be said that dispositional optimism and exercise behaviour are associated among this sample of participants, and trait self-control also had no effect on this relationship – rendering both hypotheses unsupported. However, the correlation analyses and the regression analyses revealed a positive association between trait self-control and both measures of exercise behaviour, which is line with previous research on the link between self-control and physical activity. These results call for further investigation into the potential drivers behind physical exercise. They also indicate that people's level of trait self-control better explains actual exercise engagement than optimism does, and future research should place a specific focus on strategies to improve self-control. Optimism may be needed in the pursuit of good outcomes and general well-being, but self-control is what may distinguish the doers from the thinkers.

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Table 1*Sample Demographics*

Variable	Category	<i>N</i>	%
Gender	Male	129	45.6
	Female	152	53.7
	Prefer not to say	2	0.7
Age	<20	1	0.4
	20-29	71	25.1
	30-39	33	11.7
	40-49	85	30.0
	50-59	68	24.0
	60-69	23	8.1
	≥70	2	0.7
Nationality	South Africa	113	39.9
	Netherlands	43	15.2
	Germany	30	10.6
	United Kingdom	25	8.8
	France	6	2.1
	Italy	6	2.1
	Austria	5	1.8
	Switzerland	5	1.8
	Sweden	5	1.8
	Belgium	3	1.1
	Denmark	3	1.1
	Spain	3	1.1
	Hungary	3	1.1
	Ireland	3	1.1
	Norway	3	1.1
	Russia	3	1.1
	Brazil	2	0.7
	Colombia	2	0.7
	India	2	0.7
Romania	2	0.7	

OPTIMISM, EXERCISE, AND SELF-CONTROL

	United States	2	0.7
	Botswana	1	0.4
	Cyprus	1	0.4
	Finland	1	0.4
	Indonesia	1	0.4
	Israel	1	0.4
	Japan	1	0.4
	Kenya	1	0.4
	Morocco	1	0.4
	North Macedonia	1	0.4
	Mauritius	1	0.4
	New Zealand	1	0.4
	Poland	1	0.4
	Turkey	1	0.4
	Yemen	1	0.4
Frequency of exercise	Less than once a week	67	23.7
	Once a week	47	16.6
	Twice a week	47	16.6
	More than twice a week	122	43.1
Exercise goal	Yes	113	39.9
	No	170	60.1

Notes. $N = 283$.

Table 2*Means, Standard Deviations, Intercorrelations, and Cronbach's Alpha Coefficients of Variables*

Variables	<i>M</i>	<i>SD</i>	1	2	3	4	5
1. Dispositional optimism	3.50	0.68	0.78				
2. Trait self-control	3.26	0.66	.33** (<.001)	0.83			
3. Minutes of exercise	126.20	127.83	.04 (.496)	.12* (.046)	-		
4. Frequency of exercise	2.79	1.23	.10 (.100)	.16* (.006)	.70** (<.001)	-	
5. Exercise goal	1.60	0.49	-.08 (.161)	-.03 (.639)	-.20** (<.001)	-.33** (<.001)	-
6. Gender	1.56	0.54	-.06 (.361)	.09 (.143)	-.10 (.097)	-.03 (.596)	-.06 (.328)
7. Age	42.24	13.36	.17** (.005)	.19* (.002)	.02 (.712)	-.01 (.809)	-.01 (.915)

Notes. $N = 283$. Numbers in parentheses are corresponding p -values. Numbers in bold are Cronbach's α .

* $p < .05$ ** $p < .001$

Table 3*Regression Results of Dispositional Optimism and Trait Self-Control on Minutes of Exercise*

	Minutes of exercise								
	Model 1			Model 2			Model 3		
	<i>B</i>	<i>SE</i>	<i>Beta</i>	<i>B</i>	<i>SE</i>	<i>Beta</i>	<i>B</i>	<i>SE</i>	<i>Beta</i>
(Constant)	126.20 (<.001)	7.61		126.20 (<.001)	7.57		125.46 (<.001)	7.89	
OPT	7.64 (.496)	11.23	.04	.42 (.972)	11.82	.00	1.46 (.905)	12.23	.01
TSC				22.87 (.061)	12.18	.12	22.33 (.070)	12.30	.12
OPT x TSC							5.11 (.735)	15.05	.02
<i>R</i> ²	.00			.01			.01		
<i>R</i> ² change	.00			.01			.00		
<i>F</i>	.46			1.20			1.37		
<i>p</i>	.496			.137			.253		

Notes. *N* = 283. All predictors were centred prior to analyses. Numbers in parentheses are corresponding *p*-values. OPT = dispositional optimism. TSC = trait self-control.

Table 4*Regression Results of Dispositional Optimism and Trait Self-Control on Frequency of Exercise*

	Frequency of exercise								
	Model 1			Model 2			Model 3		
	<i>B</i>	<i>SE</i>	<i>Beta</i>	<i>B</i>	<i>SE</i>	<i>Beta</i>	<i>B</i>	<i>SE</i>	<i>Beta</i>
(Constant)	2.79 (<.001)	.07		2.79 (<.001)	.07		2.80 (<.001)	.08	
OPT	.19 (.086)	.11	.10	.09 (.425)	.11	.05	.08 (.479)	.12	.05
TSC				.30 (.010)	.12	.16	.30 (.010)	.12	.16
OPT x TSC							-.04 (.800)	.14	-.02
<i>R</i> ²	.01			.03			.03		
<i>R</i> ² change	.01			.02			.00		
<i>F</i>	2.96			4.88			3.27		
<i>p</i>	.086			.008			.022		

Notes. *N* = 283. All predictors were centred prior to analyses. Numbers in parentheses are corresponding *p*-values. OPT = dispositional optimism. TSC = trait self-control.

Appendix

Information About the Study – “Optimism and Exercise Behaviour”

You have been invited to participate in a research study about how dispositional optimism affects exercise behaviour, and whether trait self-control plays a role in this relationship. Before you decide to participate in this study, it is important that you understand why the research is being done and what it will involve. Please take the time to read the following information carefully.

Purpose of the research

The purpose of this research study is to learn more about the determinants of exercise behaviour. More specifically, whether optimism and self-control affect people’s decision to engage in exercise. To study this, we are asking people like you to participate in our research study.

Study Procedures:

- First, you will be asked to consent to participate (below).
- In this research study, you will be asked to respond to a few simple statements and some general questions about yourself, such as your age and gender; this will help us describe attitudes and behaviours in the larger population.
- This study will take approximately 5-10 minutes.
- You must be 18 years or older to participate.

Participating in this study

Participating in this study is voluntary. You can decide to stop participating in this study at any moment. If you decide now not to participate, you don’t have to explain why and this will not have any negative consequences.

There are no benefits to participating in this study, and no foreseeable risks or disadvantages. Some of the things you read might make you feel positive or negative emotions, but no more than what you would normally encounter while reading the news or talking to other people. If you feel uncomfortable, you may stop participating at any time. The project has ethical approval from the Faculty Ethics Review Board (FERB) of Utrecht University.

How will we treat your data?

The data that we collect in this study are anonymous and therefore cannot be traced back to you as an individual. The collected data will be used for educational purposes, namely for a master's thesis project within the Social, Health and Organisational Psychology master's programme at Utrecht University.

If you have any questions:

This research is being conducted by Lisa Cathleen Fourie of Utrecht University for the master's thesis project, supervised by Lisanne Versteegt (Social Sciences, Psychology, Utrecht University).

You may always ask questions about the research. You can do so by contacting one of the researchers, Lisa Fourie (l.c.fourie@students.uu.nl) or Lisanne Versteegt (l.versteegt@uu.nl).

Do you have questions or concerns regarding your rights as a research participant? For this you may also contact the Faculty Ethics Review Committee of Utrecht University:

[Student Ethics Review & Registration \(UU-SER\) | Contact](#)

Informed Consent

I understand the information about the study that is presented to me. I understand that my participation is voluntary and that I can stop participating at any moment in time, without explanation. To stop participating will not have negative consequences for me.

Consent to participate in the research

- Yes, I consent to participate.
- No, I do not consent to participate.

Consent to processing my personal data (e.g., age, gender):

- Yes, I consent to the processing of my personal data as mentioned in the research information.
- No, I do not consent to the processing of my personal data.

[DISPOSITIONAL OPTIMISM]

Please respond as accurately and honestly as you can. There are no right or wrong answers.

Please indicate your answer to each statement.

1. In uncertain times, I usually expect the best.

Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1	2	3	4	5
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

2. It's easy for me to relax.

Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1	2	3	4	5
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

3. If something can go wrong for me, it will.

Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1	2	3	4	5
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

4. I'm always optimistic about my future.

Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1	2	3	4	5
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

5. I enjoy my friends a lot.

Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1	2	3	4	5
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

6. It's important for me to keep busy.

Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1	2	3	4	5
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

7. I hardly ever expect things to go my way.

Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1	2	3	4	5
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

8. I don't get upset too easily.

Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1	2	3	4	5
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

9. I rarely count on good things happening to me.

Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1	2	3	4	5
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

10. Overall, I expect more good things to happen to me than bad.

Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1	2	3	4	5
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

[EXERCISE BEHAVIOUR]

The following questions are about your exercise engagement. Please answer as accurately as possible, to the best of your knowledge. Remember that your answers are anonymous.

How many times did you exercise per week in the 3 months preceding the day of this online study? (Exercise being one session of a minimum of 20 minutes of intense physical activity)

1. Less than once a week
2. Once a week
3. Twice a week
4. More than twice a week

How many minutes did you exercise in the week preceding the day of this online study?

_____ minutes

Are you currently pursuing an exercise goal?

1. Yes, specify:
2. No

[TRAIT SELF-CONTROL]

For each of the following statements please indicate how much each statement reflects how you typically are.

1. I am good at resisting temptation.

Not at all like me

Very much like me

1	2	3	4	5
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

2. I have a hard time breaking bad habits.

Not at all like me

Very much like me

1	2	3	4	5
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

3. I am lazy.

Not at all like me

Very much like me

1	2	3	4	5
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

4. I say inappropriate things.

Not at all like me

Very much like me

1	2	3	4	5
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

5. I do certain things that are bad for me, if they are fun.

Not at all like me

Very much like me

1	2	3	4	5
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

6. I refuse things that are bad for me.

Not at all like me

Very much like me

1	2	3	4	5
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

7. I wish I had more self-discipline.

Not at all like me

Very much like me

1	2	3	4	5
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

8. People would say that I have iron self-discipline.

Not at all like me				Very much like me
1	2	3	4	5
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

9. Pleasure and fun sometimes keep me from getting work done.

Not at all like me				Very much like me
1	2	3	4	5
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

10. I have trouble concentrating.

Not at all like me				Very much like me
1	2	3	4	5
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

11. I am able to work effectively toward long-term goals.

Not at all like me				Very much like me
1	2	3	4	5
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

12. Sometimes I can't stop myself from doing something, even if I know it is wrong.

Not at all like me				Very much like me
1	2	3	4	5
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

13. I often act without thinking through all the alternatives.

Not at all like me				Very much like me
1	2	3	4	5
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

[DEMOGRAPHIC INFORMATION]

Finally, we would like to ask a few questions about you. Remember that your answers are anonymous.

What is your gender?

1. Male
2. Female
3. Other, ...
4. Prefer not to answer

What is your age? _____ years

What is your nationality?

_____ (country)

Do you have any comments or suggestions about the survey or your experience? Please feel free to leave a comment below:

This is the end of the questionnaire. Thank you for participating!

The purpose of this research is to learn more about how dispositional optimism versus pessimism affects exercise engagement, and whether this relationship is influenced by high versus low trait self-control.

If you have questions about the research, please feel free to contact Lisa Fourie (l.c.fourie@students.uu.nl) or Lisanne Versteegt (l.versteegt@uu.nl).