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Socioeconomic status, social influence and regular leisure-time physical activity: the mediating roles and relative importance of role modelling, social support and subjective social norm

Master thesis

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Abstract

Background: People with low socioeconomic status (SES) are less likely to do regular leisure-time physical activity (LTPA), however, there is a lack of knowledge on the mediating roles and relative importance of social influence in this relationship. Therefore, this research examines the hypothesis that role modelling, social support and subjective social norm mediate the relationship between SES and regular LTPA, where social support is expected to be the most important type of social influence, respectively followed by role modelling and subjective social norm.

Methods: 2360 participants of the Dutch longitudinal GLOBE-study of 2014 (54.3% female, M_{age} = 47.9 years, SD_{age} = 15.5 years) fully completed a postal questionnaire measuring educational level (i.e., the SES-indicator), regular LTPA, and role modelling, social support and subjective social norm for regular physical activity. Logistic regressions and mediation analyses, using PROCESS, were used to assess the relationship between SES and regular LTPA, and the mediating effects and relative importance of the social influences.

Results: Participants in the highest educational group (OR = 2.86, 95% CI [1.80, 4.56]) were more likely to do regular LTPA than their lower-status counterparts. SES was positively associated with subjective social norm, and all social influences were positively associated with regular LTPA. The association between SES and regular LTPA was partially mediated by subjective social norm, but not mediated by role modelling and social support, as both social influences were not significantly associated with SES.

Conclusions: Subjective social norm for regular physical activity contributes to the explanation of socioeconomic differences in regular LTPA. Results suggest that intervention and policy strategies to reduce socioeconomic differences in regular LTPA and, ultimately, in health, would benefit from raising the social norm for regular LTPA in lower SES-groups. Future research may further investigate which other pathways are driving the relationship between SES and regular LTPA.

Keywords: regular leisure-time physical activity, socioeconomic status, role modelling, social support, social norm

Introduction

Physical activity reduces the risk of many adverse health conditions, including coronary heart disease, type 2 diabetes, and breast and colon cancers (Lee et al., 2012). In addition, it can improve musculoskeletal health, control body weight and reduce symptoms of depression (WHO, 2009). Despite these known benefits, more than 30% of people worldwide do not meet recommended levels of physical activity (Kohl et al., 2012), which even is 47% for the Netherlands (CBS, 2022). Physical inactivity is the fourth leading cause of death globally (WHO, 2009), and as such has been described as one of the major public health problems of the 21st century in developed countries (Blair, 2009).

Adults with lower socioeconomic status (SES) report less participation in physical activity (e.g., Droomers et al., 1998; 2001), and experience worse health than their higher-status counterparts (Mackenbach et al., 2008). This also applies to the Dutch context, where fewer low-educated people meet the Dutch movement guidelines[1] and rate their health as good compared to high-educated people, among men and women of all age categories (Volksgezondheidenzorg.info, 2021). As such, adults with low SES in the Netherlands possess a heightened risk of decreased health due to physical inactivity (Groeniger et al., 2017).

To be able to change physical inactivity in order to improve the health of low SES-groups, it is important to understand the mechanisms underlying the socioeconomic gradient in physical inactivity. Presently, it is known from research that a combination of neighbourhood, household and individual factors can explain socioeconomic inequalities in physical activity to a large extent (Kamphuis et al., 2008; 2009). However, little is known about the contribution of social influence (i.e., role modelling, social support and subjective social norm) to socioeconomic inequalities in regular leisure-time physical activity (LTPA) among Dutch adults, which is the domain of physical activity where most activity occurs in high-income countries (WHO, 2009). Nonetheless, it is relevant to understand the role of social influence in this relationship as poor social networks and low social support are more frequent among people with low SES (Weyers et al., 2008), and physical activity typically is shaped by one's social environment (Li et al., 2005). In addition, little is known about the relevant importance of different types of social influence for regular LTPA, which is

[1] The Dutch movement guidelines refer to being physically active at moderate intensity (e.g., walking and cycling) for at least 150 minutes a week, spread over several days (Gezondheidsraad, 2017).

important to investigate as well as role modelling, social support and subjective social norm could make a unique contribution towards explaining behaviour (De Vries et al., 2000). Therefore, this study aims to examine the mediating roles and relative importance of role modelling, social support and subjective social norm in the relationship between SES and regular LTPA among Dutch adults.

Existing research

Socioeconomic status (SES) refers to the position of members of social groups in the social hierarchy and determines people's access to resources and their exposure to privileged and disadvantaged situations in society, leading to social inequality (Mackenbach, 2019). The fault lines in society caused by SES are likely to be deeper than those caused by other social indicators since social networks of different SES-groups are mostly separate and individuals with different SES hardly mix (Volker et al., 2014). As a result, people with low SES are at increased risk of being structurally isolated and of receiving inappropriate social support (Weyers et al., 2008).

This could have implications for social influence and physical activity, as most physical activity occurs within the bounds of families, communities, and neighbourhoods (Li et al., 2005). Social influence can be defined as a change in the beliefs, attitudes or behaviours of an individual that results from interaction with another individual or group (Rashotte, 2007). The Attitude-Social Influence-Efficacy Model distinguishes three types of social influence, including role modelling, social support and social norms (De Vries et al., 2000). Role modelling refers to the perception of others engaging in a particular behaviour, social support includes instrumental or emotional encouragement for behaviour, and social norms, often measured subjectively, are the perceptions someone has about what others in the social environment expect him or her to do (De Vries et al., 2000; Pender, 2011).

Several studies have shown relationships of these types of social influence with LTPA, which refers to all forms of physical activity outside one's regular occupation, housework or transportation (Kandula & Lauderdale, 2005). For example, previous research found that individuals who have network members that engage in LTPA are more likely to engage in LTPA themselves as well (Firestone et al., 2015). Besides role modelling, social support (Cheng et al., 2014; Eyler et al.,1999), and subjective family norms for exercise (Abraído-Lanza et al., 2017), were also positively associated with LTPA. However, these studies contained no reference to their patterning across socioeconomic groups or the relative importance of different types of social influence.

Other studies have shown the importance of social influence in explaining socioeconomic inequalities in participation in specific types of LTPA. Kamphuis and colleagues (2008) found that low levels of social support and role modelling were associated with not doing sports and were reported more often among adults with low SES. Furthermore, another study found that social influence, including all types, contributed to the explanation of socioeconomic differences in no recreational walking among older adults (Kamphuis et al., 2009). However, while investigating underlying mechanisms for specific LTPA outcomes is important (Giles-Corti et al., 2005), the amount of time and days spent on all LTPA are decisive factors for substantial health benefits according to the Dutch movement guidelines (Gezondheidsraad, 2017). When the focus is on a specific activity, such as sports participation, someone who does not exercise but cycles a lot will still be classified as 'no sports participation', while certainly not inactive. Furthermore, the health benefits of exercising once a week are lower than performing LTPA more often. Therefore, this study focuses on the relationship between SES, social influence and regular LTPA, including time and days spent walking, cycling, gardening, doing odd jobs and exercising.

Regarding the relative importance of different types of social influence for LTPA, subjective social norm was found to only have a weak effect in predicting physical activity (Kim et al., 2019). It is suggested that social support may be more important for LTPA than subjective social norm as it contains more direct assistance (e.g., encouragement) for behaviour than information on others' opinions regarding the behaviour (Kim et al., 2019; Okun et al., 2003). In addition, a study that included social support and role modelling found that social support was a stronger predictor of LTPA than role modelling, although both important (Okun et al., 2003). Based on these findings, it is likely that social support is the most important factor in the relationship between SES and regular LTPA, respectively followed by role modelling and subjective social norm.

Theoretical approach

Berkman and colleagues (2000) developed a conceptual model of how social networks affect health. They argue that there is a cascading causal process in which macro-level social-structural conditions, including culture, socioeconomic factors, politics and social change, influence mezzo-level social networks, such as the structure and characteristics of network ties. Subsequently, social networks would influence behaviour through four primary pathways, namely social support, social influence, social engagement and attachment, and access to resources and material goods. Finally, these micro-psychosocial processes would

lead to a change in health status by influencing even more proximate pathways to health status, including direct physiological stress responses, psychological states and traits, health-damaging or health-promoting behaviours, and exposure to infectious disease agents. Applied to this research context, socioeconomic factors, like inequality, are hypothesized to influence social networks, affecting provided opportunities for social influence for regular physical activity, which, in turn, impacts the health-promoting behaviour LTPA.

Where the conceptual model of Berkman et al. (2000) gives an overview of the whole cascading causal process between SES and LTPA, the social capital theory of Bourdieu (1986) explains in more detail why social influences for regular physical activity might differ between socioeconomic groups. According to Bourdieu (1986), structurally based resources, which he refers to as cultural, social and economic capital, are unequally distributed in society, both as a result and key mechanism of the social reproduction of power and privilege. Cultural capital (i.e., non-material symbolic and informational resources) is not equally distributed through stratified school systems, milieus and families; access to social capital (i.e., material and non-material resources) is regulated through class barriers and language codes; and economic capital (i.e., material resources) is a decisive factor in social (dis)advantage (Abel & Frohlich, 2012; Bourdieu, 1986). Abel and Frohlich (2012) applied this framework to health inequalities and showed how interactions between different forms of health-relevant capital are important in the (re)production of health (dis)advantages. Specifically, economic and cultural capital are accumulated and transferred within social networks, like families, and condition the acquisition of health-promoting social capital (Abel & Frohlich, 2012). As people with low SES belong to disadvantaged socioeconomic networks, with lower health literacy (Stormacq et al., 2019), for example regarding LTPA benefits, it is plausible they experience less role modelling, social support and subjective social norms in favour of regular LTPA.

The impact of social influence on regular LTPA is explained in more detail by the Health Promotion Model (Pender, 2011). According to this model, social networks can increase or decrease engagement in health-promoting behaviour, where people are assumed to be more likely to engage in health-promoting behaviours when significant others model the behaviour (i.e., role modelling), expect the behaviour to occur (i.e., subjective social norm), and provide assistance and support to enable the behaviour (i.e., social support). Applied to the current study, it is therefore expected that role modelling, social support and subjective social norm for regular physical activity lead to more regular LTPA.

Research question

As argued above, there is a lack of knowledge on the mediating roles and relative importance of role modelling, social support and subjective social norm in the relationship between SES and regular LTPA. However, these are important to investigate as regular LTPA is a decisive factor for substantial health benefits (Gezondheidsraad, 2017), and different types of social influences could make a unique contribution to explaining behaviour (De Vries et al., 2000). Therefore, the following research question will be examined: *What are the mediating roles and relative importance of role modelling, social support and subjective social norm in the relationship between socioeconomic status (SES) and regular leisure-time physical activity (LTPA) among Dutch adults?*

To guide the current study, a conceptual model is created that combines insights from the model of Berkman et al. (2000), Bourdieu's (1986) capital theory and the Health Promotion Model (Pender, 2011). The model of Berkman et al. (2000) gives an overview of the whole cascading causal process between SES and LTPA, where socioeconomic factors, like inequality, are hypothesized to influence social networks, affecting provided opportunities for social influence for regular physical activity, which, in turn, impacts the health-promoting behaviour regular LTPA. Bourdieu's sociological capital theory explains how social-structural factors influence social influence in more detail, where it is argued that lower SES-groups have less access to health-promoting capital in their network, and as such are less likely to experience role modelling, social support and social norms in favour of regular LTPA (Abel & Frohich, 2012; Bourdieu, 1986). Finally, based on the social-psychological Health Promotion Model of Pender (2011), it is expected that role modelling, social support and subjective social norm for regular physical activity positively influence an individual's engagement in regular LTPA. Regarding the relative importance, preliminary findings and suggestions of research point to social support as the most important factor in the relationship between SES and regular LTPA, respectively followed by role modelling and subjective social norm (Kim et al., 2019; Okun et al., 2003).

Based on existing research and the theoretical framework, the following hypotheses are formulated (see Figure 1).

H1: There is a positive relationship between SES and regular LTPA.

H2: There is a positive relationship between SES and role modelling (*H2a*), SES and social support (*H2b*), and SES and subjective social norm (*H2c*).

H3: There is a positive relationship between role modelling and regular LTPA (*H3a*), social support and regular LTPA (*H3b*), and subjective social norm and regular LTPA (*H3c*).

H4: The relationship between SES and regular LTPA is mediated by role modelling (*H4a*), social support (*H4b*) and subjective social norm *(H4c)*.

H5: Social support is the most important social influence in the relationship between SES and regular LTPA, respectively followed by role modelling and subjective social norm.

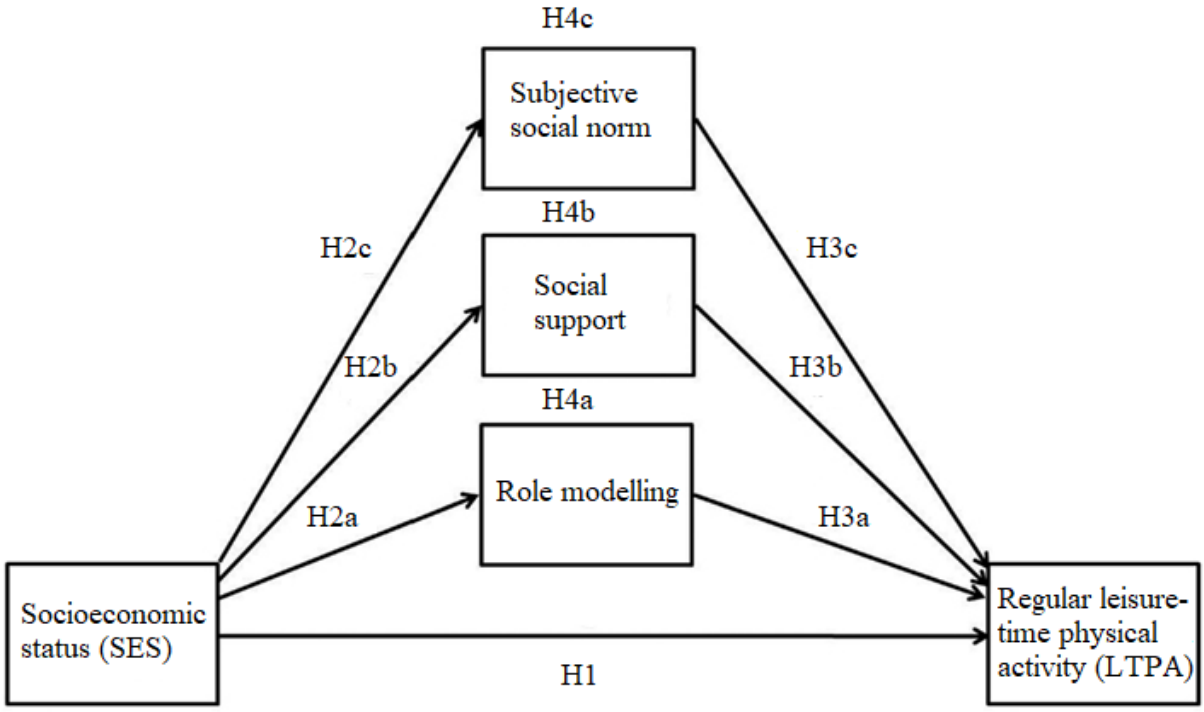

Figure 1

Theoretical research model

Method

Study design

Original data were collected by a large-scale postal survey in 2014, administered as the fifth wave of data collection for the longitudinal GLOBE-study, among a stratified sample of the adult population (age 25-75 years) of Eindhoven and fifteen surrounding cities in the Netherlands. Like the current study, the main aim of the GLOBE-study is to quantitatively assess mechanisms and factors explaining socioeconomic inequalities in health (Van Lenthe et al., 2013). Participants were invited by letter and given fill-in instructions and background information. Subsequently, they were asked to fill in the Dutch questionnaire, which consisted

of one hundred questions and took about thirty minutes to complete. Finally, participants were thanked for their participation and asked to return the questionnaire in the enclosed return envelope.

Study sample

For the GLOBE-study of 2014, 10,668 individuals were invited to participate, consisting of 4,886 participants of the existing GLOBE-cohort, supplemented with a random sample of 5,782 newly selected persons from the municipality register of Eindhoven. A total of 4,851 respondents returned the completed questionnaire (response = 45.5%), from which a representative cross-sectional sample of the target population, i.e., adults between 25 and 75 years of age living in Eindhoven (N = 2,812), was selected for the analyses described in the current study. However, as 452 participants did not complete the questionnaire items needed for the current analyses (i.e., not answer at all, indicated it was not applicable, indicated they did another type of education and/or given multiple answers), they had to be excluded. More specifically, there were missing values for SES (n = 24), role modelling (n = 181), social support (n = 363), subjective social norm (n = 198), country of origin (n = 13) and marital status (n = 9). Therefore, the analytic sample comprised 2360 participants.

Data and measurements

The GLOBE-study questions that were used to measure SES, the social influences, regular LTPA, and the potential confounders are described below and can be found in Appendix A.

Socioeconomic status (SES)

Highest educational attainment is considered a good indicator for SES in the Netherlands (Van Berkel-Van Schaik & Tax, 1990), and, therefore, used as SES-indicator in the current study. It was measured with the question: “Would you like to tick the highest level of education you have completed with a degree?” Answer categories included eight Dutch education levels ascending to the highest level and two options where participants could indicate they did something else or did not remember, coded into four categories (1 = no education or primary education; 2 = lower professional and intermediate general education; 3 = intermediate professional and higher general education; 4 = higher professional education and university).

Social influences

Three separate variables represent social influences in the analysis, including role modelling, social support and subjective social norm. These social influences were all assessed for regular physical activity and answered on a five-point scale (1 = *strongly disagree* to 5 = *strongly agree*).

Role modelling. Role modelling is conceptualized as the perception of others engaging in regular LTPA (De Vries et al, 2000). It was measured with the item: "Most important others are regularly active".

Social support. Social support is conceptualized as encouragement for regular LTPA (De Vries et al., 2000). It was measured with the item: "Most important others stimulate me to be regularly active".

Subjective social norm. Subjective social norm is conceptualized as the perception someone has about what others in the social environment expect him or her to do regarding regular LTPA (De Vries et al, 2000). It was measured with the item: "Most important others think that you should be regularly active".

Regular leisure-time physical activity (LTPA)

Regular LTPA is conceptualized as meeting the Dutch movement guidelines of being physically active at moderate intensity for at least 150 minutes a week, spread over several days. It was assessed with the Short Questionnaire to Assess Health-enhancing physical activity (SQUASH), which is a Dutch validated questionnaire to measure several types of physical activity among adults, including LTPA. Participants were asked to indicate the frequency (times per week) and average duration (hours and minutes per day) for the moderate-intensity LTPAs walking, cycling, gardening, doing odd jobs and a maximum of four sports they had done on a weekly basis (open question—no defined list given) in a normal week in the past months. Based on this, the total amount of minutes and days per week spent on all LTPA was calculated, after which a dichotomous outcome was created that indicates whether someone was sufficiently physically active to comply with the Dutch movement guidelines. This outcome was coded as “yes, is physically active for at least 150 minutes a week, spread over at least 2 days (1)” and “no, is not physically active for at least 150 minutes a week, or is physically active for at least 150 minutes a week, spread over less than 2 days (0).”

Potential confounders: gender, age, marital status and country of origin

Gender (1 = female, 2 = male), age (open-ended, in years), marital status (1 = married/registered partnership, 2 = unmarried/divorced/widowed) and country of origin (1 = Netherlands, 2 = another country) were measured as potential confounders as these variables were also taken into account in closely related research on SES and sports participation (Kamphuis et al., 2008).

Data analysis

Analyses were performed using IBM SPSS Statistics, version 28. Before running the analyses, descriptive statistics and Pearson's correlational analysis have been performed for all variables and assumptions have been checked (see Appendix B). Accordingly, variables that significantly correlated with SES and regular LTPA were included as covariates in the analyses.

Mediation analyses were performed using bootstrapping analyses in the PROCESS macro for SPSS, recommended by Hayes (2013). However, as the total effect option is not available in PROCESS with a dichotomous dependent variable (Hayes, 2020), the association between SES and regular LTPA has first been assessed using logistic regression. Subsequently, the hypothesized model (see Figure 1) has been tested by performing several regression equations relating SES (the independent variable), role modelling, social support and subjective social norm (the potential mediators), and regular LTPA (the dependent variable). More specifically, mediation analyses have been conducted for the social influences separately, after which significant mediators would be added simultaneously to examine the relative importance in a parallel mediation. Model 4 was used, with 1000 bootstrap samples and 95% confidence intervals (Field, 2018). For additional insights, logistic regressions, including the separate social influences, were also conducted. When odds ratios for the SES-indicator decreased, this was interpreted as contribution of the specific social influence to socioeconomic differences in regular LTPA. Data were stored safely on a secured server and deleted after the research was conducted.

Results

Descriptive statistics

The characteristics of the sample are presented in Table 1 and all intercorrelations in Table 2. The sample consisted of 1078 men (45.7%) and 1282 women (54.3%), with a mean age of respectively 48.6 (*SD* = 15.6) and 47.3 (*SD* = 15.3) years. The majority of participants

(81.9%) complied with the Dutch movement guidelines, with the highest educated (84.5%) reporting greater compliance than the lowest educated (68.8%). Furthermore, participants indicated moderate levels of role modelling, social support and subjective social norm for regular physical activity, with no major differences between SES-groups. Compared with higher educational groups, people in the lowest educational group were more likely to be female, to be older, to be born in a country other than the Netherlands, and to be married or in a registered partnership. As gender, age and country of origin significantly correlated with SES and regular LTPA, they were included as covariates in the mediation analyses (see Table 2).

Table 1

Sample characteristics by educational level

		Educational level[a]			
	Total	1-low	2	3	4-high
	(*n* = 2360)	(*n* = 109)	(*n* = 488)	(*n* = 575)	(*n* = 1188)
Total sample, % (*n*)	100 (2360)	4.6 (109)	20.7 (488)	24.4 (575)	50.3 (1188)
Gender, % (*n*)					
Male	45.7 (1078)	36.7 (40)	39.3 (192)	45.2 (260)	49.3 (586)
Female	54.3 (1282)	63.3 (69)	60.7 (296)	54.8 (315)	50.7 (602)
Age, mean (*SD*)	47.9 (15.5)	55.6 (15.2)	59.6 (12.8)	47.0 (14.5)	42.8 (14.1)
Marital status, % (*n*)					
Married/registred partnership	59.4 (1402)	65.1 (71)	72.3 (353)	58.3 (335)	54.1 (643)
Unmarried/divorced/widowed	40.6 (958)	34.9 (38)	27.7 (135)	41.7 (240)	45.9 (545)
Country of origin, % (*n*)					
Netherlands	89.2 (2105)	67.0 (73)	90.6 (442)	91.0 (523)	89.8 (1067)
Other	10.8 (255)	33.0 (36)	9.4 (46)	9.0 (52)	10.2 (121)
Social influences, mean (*SD*)					
Role modelling	3.70 (.84)	3.80 (.88)	3.75 (.84)	3.54 (.91)	3.74 (.78)
Social support	3.23 (1.01)	3.49 (1.02)	3.36 (1.05)	3.10 (1.02)	3.22 (.98)
Subjective social norms	3.74 (.86)	3.79 (.92)	3.74 (.93)	3.56 (.90)	3.82 (.79)
Regular LTPA, % (*n*)					
Yes, ≥ 150 minutes on ≥ 2 days	81.9 (1932)	68.8 (75)	79.7 (389)	80.7 (464)	84.5 (1004)
No, < 150 minutes and/or < 2 days	18.1 (428)	31.2 (34)	20.3 (99)	19.3 (111)	15.5 (176)

[a] Educational level with 1 = no education or primary education, 2 = lower professional and intermediate general education, 3 = intermediate professional and higher general education, and 4 = higher professional education and university.

Table 2

Pearson correlations between study variables

	1	2	3	4	5	6	7	8
1 SES								
2 Regular LTPA	.08**							
3 Role modelling	.00	.07**						
4 Social support	-.06**	.08**	.35**					
5 Subjective social norms	.05*	.07**	.44**	.47**				
6 Gender	.09**	.04*	-.02	-.02	-.02			
7 Age	-.40**	.08**	.03	.06**	.07**	.04*		
8 Marital status	.13**	-.04	-.00	-.04*	-.05**	-.06**	-.38**	
9 Country of origin	-.07**	-.08**	.02	.09**	.01	-.03	-.08**	-.05*

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Logistic regression: SES and regular LTPA

First, a logistic regression was performed to assess the association between SES and regular LTPA. As presented in Table 3, participants in the highest educational group (OR = 2.86, 95% CI [1.80, 4.56]) were more likely to do regular LTPA than their lower-status counterparts.

Table 3

Odds ratios (OR) for regular LTPA (adjusted for gender, age & country of origin)

	Model 1: education			Model 2: education + covariates		
	OR	95% CI	*p*	OR	95% CI	*p*
Education						
1 - low	1.00		<.001**	1.00		<.001**
2	1.78	[1.12, 2.83]		1.46	[0.91, 2.36]	
3	1.90	[1.20, 2.99]		2.01	[1.25, 3.24]	
4 - high	2.47	[1.60, 3.82]		2.86	[1.80, 4.56]	
Gender						
Female				1.00		.189
Male				1.16	[0.93, 1.43]	
Age				1.02	[1.01, 1.03]	<.001**
Country of origin						
Netherlands				1.00		.005**
Another country				0.64	[0.47, 0.87]	

*** Correlation is significant at the 0.01 level (2-tailed).*

** Correlation is significant at the 0.05 level (2-tailed).*

Mediation analyses

Second, mediation analyses have been conducted for role modelling, social support and subjective social norm.

Role modelling

The results of the mediation analysis with role modelling are depicted in Figure 2. Different than expected, SES was not significantly associated with role modelling (b = 0.020, 95% CI [-0.020, 0.060], t = 0.979, p = .328). In line with the prediction, role modelling did have a significant positive relationship with regular LTPA (b = 0.192, 95% CI [0.069, 0.315], p = .002). However, as the indirect effect (b = 0.039, 95% CI [-0.038, 0.014]) was not statistically significant, mediation could not be concluded. In addition, the direct effect from SES on regular LTPA remained significant in the model with role modelling as well (b = 0.341, 95% CI [0.217, 0.464], p = .000).

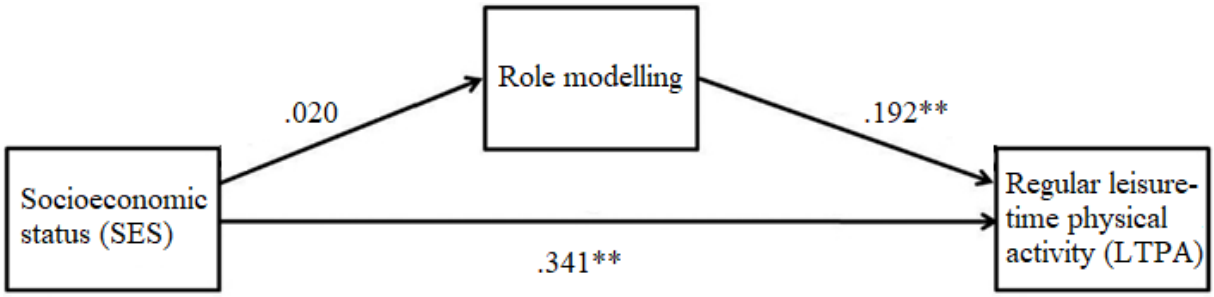

Figure 2

*Results of mediation analysis testing role modelling as mediator of the effect of SES on regular LTPA, while controlling for gender, age and country of origin. *p < .05, **p < .01.*

Social support

The results of the mediation analysis with social support are depicted in Figure 3. Different than expected, SES was not significantly associated with social support (b = -0.030, 95% CI [-0.079, 0.018], t = -1.219, p = .223). In line with the prediction, social support did have a significant positive relationship with regular LTPA (b = 0.217, 95% CI [0.113, 0.321], p = .000). However, as the indirect effect (b = -0.007, 95% CI [-0.020, 0.004]) was not statistically significant, mediation could not be concluded. In addition, the direct effect from SES on regular LTPA remained significant in the model with social support as well (b = 0.351, 95% CI [0.227, 0.475], p = .000).

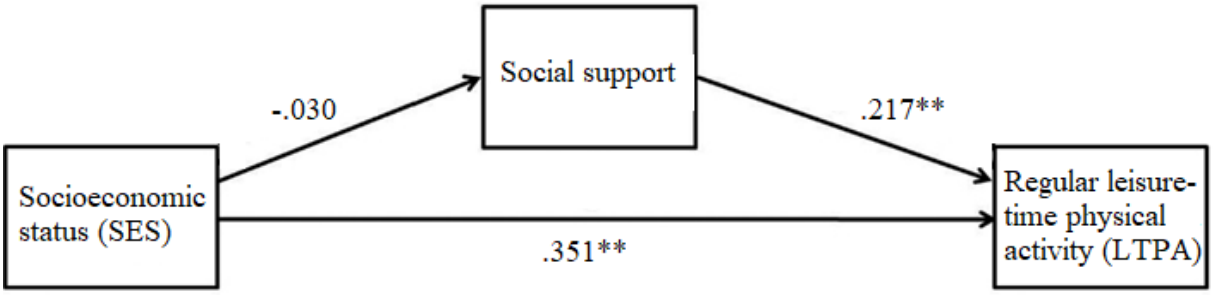

Figure 3

*Results of mediation analysis testing social support as mediator of the effect of SES on regular LTPA, while controlling for gender, age and country of origin. *p < .05, **p < .01.*

Subjective social norm

The results of the mediation analysis with subjective social norm are depicted in Figure 4. Consistent with the prediction, the associations between SES and subjective social norm (b = 0.090, 95% CI [0.049, 0.132], t = 4.29, p = .000), and subjective social norm and regular LTPA (b = 0.162, 95% CI [0.045, 0.280], p = .007) were statistically significant and positive. The indirect effect of SES on regular LTPA through subjective social norm was significant and positive as well (b = 0.014, 95% CI [0.003, 0.028]). Finally, the direct effect from SES on regular LTPA remained significant (b = 0.330, 95% CI [0.206, 0.454], p = .000), therefore indicating partial mediation. As only subjective social norm was a mediator of the relationship between SES and regular LTPA, no parallel mediation analysis was conducted.

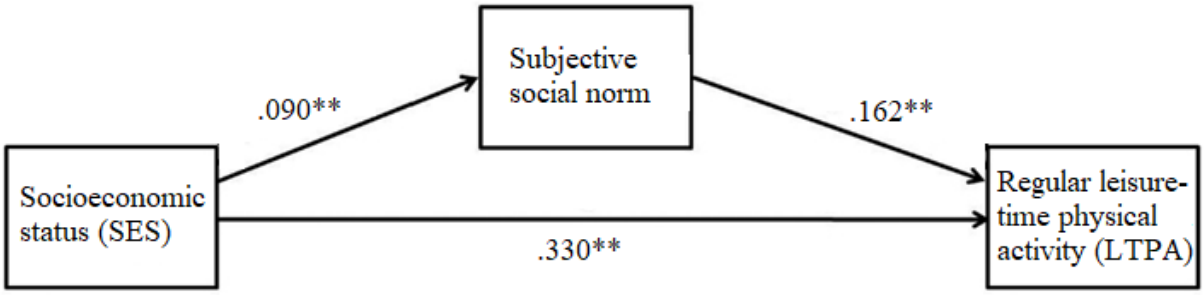

Figure 4

*Results of mediation analysis testing subjective social norm as mediator of the effect of SES on regular LTPA, while controlling for gender, age and country of origin. *p < .05, **p < .01.*

Logistic regressions: contribution separate social influences

Third, extra logistic regressions, including the social influences, have been performed. As presented in Table 4, the odds ratios to be regularly active on LTPA were statistically significant and positive for all separate social influences. However, when comparing the odds ratios for the educational levels in the model without the social influences (see Table 3), only the odds ratio for the highest educational group (OR = 2.86, 95% CI [1.80, 4.56]) slightly reduced when subjective social norm was added (OR = 2.81, 95% CI [1.76, 4.48]).

Table 4

Odds ratios (OR) for regular LTPA, including SES and separate social influences, adjusted for gender, age & country of origin.

	Model 3: education + covariates + role modelling			Model 4: education + covariates + social support			Model 5: education + covariates + subjective social norm		
	OR	95% CI	*p*	OR	95% CI	*p*	OR	95% CI	*p*
Education									
1 - low	1.00		<.001**	1.00		<.001**	1.00		<.001**
2	1.47	[0.91, 2.37]		1.48	[0.92, 2.40]		1.49	[0.92, 2.40]	
3	2.11	[1.30, 3.41]		2.10	[1.30, 3.41]		2.07	[1.28, 3.35]	
4 - high	2.86	[1.79, 4.56]		2.94	[1.84, 4.70]		2.81	[1.76, 4.49]	
Role modelling									
Strongly disagree	1.00		.024*						
Disagree	1.99	[0.86, 4.59]							
Neither agree nor disagree	2.01	[0.92, 4.39]							
Agree	2.56	[1.19, 5.54]							
Strongly agree	2.97	[1.31, 6.74]							
Social support									
Strongly disagree				1.00		<.001**			
Disagree				1.20	[0.75, 1.91]				
Neither agree nor disagree				1.24	[0.81, 1.90]				
Agree				2.03	[1.31, 3.16]				
Strongly agree				1.87	[1.07, 3.28]				
Subjective social norm									
Strongly disagree							1.00		.020*
Disagree							1.14	[0.55, 2.38]	
Neither agree nor disagree							0.92	[0.49, 1.74]	
Agree							1.34	[0.72, 1.74]	
Strongly agree							1.63	[0.83, 3.19]	
Gender									
Female	1.00		. 160	1.00		.166	1.00		.160
Male	1.17	[0.94, 1.45]		1.17	[0.94, 1.45]		1.17	[0.94, 1.45]	
Age	1.02	[1.01, 1.03]	<.001**	1.02	[1.01, 1.03]	<.001**	1.02	[1.01, 1.03]	<.001**
Country of origin									
Netherlands	1.00		.004**	1.00		.001**	1.00		.002**
Another country	0.63	[0.46, 0.86]		0.59	[0.43, 0.81]		0.62	[0.45, 0.84]	

*** Correlation is significant at the 0.01 level (2-tailed).*

** Correlation is significant at the 0.05 level (2-tailed).*

Discussion

Participants in the highest educational group were more likely to do regular LTPA than their lower-status counterparts. Within this relationship, SES was found to be positively associated with subjective social norm, and all social influences were positively associated with regular LTPA. The association between SES and regular LTPA was partially mediated by subjective social norm, but not mediated by role modelling and social support, as both social influences were not significantly associated with SES.

In line with hypothesis one, results revealed that people with higher educational levels indicate to perform more regular LTPA than their lower-status counterparts. This is consistent with previous national research (Volksgezondheidenzorg.info, 2021), and, therefore, provides additional evidence that the relationship between SES and LTPA not only exists for participation in specific types of LTPA (e.g., Kamphuis et al., 2008; 2009), but also for regular performance of LTPA.

Also in line with hypothesis 2C, high-educated people experienced a slightly higher subjective social norm for regular physical activity. This is consistent with Bourdieu's capital theory, from which it was predicted that people with lower educational levels acquire less health-promoting social capital, such as social influences for regular LTPA, as they belong to more disadvantaged socioeconomic networks (Abel & Frohlich, 2012; Bourdieu, 1986). However, there were no educational differences in role modelling and social support for regular LTPA, rejecting hypotheses 2A and 2B. Current socioeconomic differences in social influences for regular physical activity could probably be smaller than in the past as health-promoting capital is more widely shared nowadays (e.g., in the media and schools), rather than mainly in social networks. Furthermore, research suggested that heavy work obligations or frequent absence from home could hinder the development of stable relations in higher SES-groups (Weyers et al., 2008), which could also partially explain why socioeconomic differences in social support and role modelling might be smaller than expected. Finally, the questionnaire did not describe what 'regular physical activity' entails, so the judgement of the experienced social influences for regular physical activity is subjective. When people with lower SES have lower standards for regular physical activity due to lower accumulated health-promoting social capital (Bourdieu, 1986), this could have led to relatively higher scores on the social influences.

In line with hypotheses 3A, 3B and 3C, there were positive associations between all separate social influences and regular LTPA. These findings are consistent with the Health Promotion Model (Pender, 2011), assuming that people are more likely to engage in health-

promoting behaviours when significant others model the behaviour, expect the behaviour to occur, and provide support for the behaviour. Furthermore, these results extend previous findings, showing that role modelling (Firestone et al., 2015; Kamphuis et al., 2008; 2009), social support (Cheng et al., 2014; Eyler et al.,1999; Kamphuis et al., 2008; 2009), and subjective norm (Abraído-Lanza et al., 2017; Kamphuis et al., 2009) are not only positively associated with participating in LTPA, but also with accumulated time spent on multiple types of LTPA.

In line with hypothesis 4C, there was support for a partial mediation effect by subjective social norm. This result extends previous findings by showing that subjective social norm is not only important in explaining socioeconomic inequalities in participating in specific types of LTPA (Kamphuis et al., 2009), e.g., recreational walking, but also in overall LTPA-levels. However, there was no support for mediation effects of role modelling (i.e., H4A) and social support (i.e., H4B), since the association between SES and both social influences, as well as the indirect effects, were not statistically significant (see text at hypothesis 2 for possible explanations). As only subjective social norm was a mediator of the relationship between SES and regular LTPA, no parallel mediation analysis was conducted and H5 was rejected.

The current study was among the first to investigate the mediating roles and relative importance of role modelling, social support and subjective social norm in the relationship between SES and regular LTPA. As such, it contributes to the current limited understanding regarding this research topic, showing that subjective social norm for regular physical activity contributes to the explanation of socioeconomic differences in regular LTPA. Another strength of the current study is the high power due to the big sample size, meaning there was a high chance of finding a mediation effect if one exists.

Despite its contribution, this study also has limitations. First, the study design was cross-sectional and, therefore, findings should not be confused with causation. Second, educational level remains a single indicator for SES. It is recommended to also take into account income and/or occupation to measure SES more accurately. Third, parental SES was not considered a confounder, but is likely associated with SES and regular LTPA as well. Therefore, future studies are advised to also include parental SES. Fourth, it is likely that the percentage of people complying with the movement guidelines in this study (i.e., 81.9%) appeared to be higher than the national 47% of compliance (CBS, 2022) because this study

did not measure the other component of the Dutch movement guidelines[2]. Moreover, both percentages (i.e., 81.9% and 47%) may be higher than the actual compliance rate because participants could have overreported the time spent on LTPA, as an active lifestyle is socially desirable (Van de Mortel, 2008). However, the urge for socially desirable answering was limited by asking questions in a postal questionnaire and indicating there are no right or wrong answers. Nonetheless, it can be speculated that higher educational groups overestimate their LTPA slightly more than lower educational groups as their subjective social norm for regular LTPA is a bit higher. Therefore, educational differences reported here may be slightly larger than actual socioeconomic differences in LTPA. Besides, the focus on LTPA excludes other types of physical activity where lower SES-groups might be more active. For example, research found higher occupational physical activity (OPA) levels among adults with lower education (Finger et al., 2012). However, while LTPA is associated with improved health, higher OPA is considered detrimental to health (Coenen et al., 2018), which further emphasizes the importance of changes in their physical activity pattern. Finally, a simple cross tabulation (see Appendix C) showed that the group with missing values (n = 452) significantly differed on SES, regular LTPA and all social influences from the group without missing values. The group with missing values is generally less educated and less regularly active on LTPA, with most of the missing values being on the social influences. Excluding these participants thus could have led to an underestimation of SES differences in regular LTPA. Furthermore, it is possible that participants with missing values on the social influences do not have people who exercise regularly, support them or share norms for regular LTPA, but this cannot be determined. However, if this was the case, this may have led to an underestimation of the effect of the social influences.

Based on the findings, several recommendations can be made. Firstly, as subjective social norm for regular physical activity partially mediates the relationship between SES and regular LTPA, increasing the social norm regarding regular LTPA in lower SES-groups seems helpful to decrease socioeconomic inequalities in regular LTPA. For example, ´ambassadors´ of regular LTPA can be mobilized in lower SES-groups, meaning that certain people from lower SES-groups are educated about the benefits of regular LTPA and stimulated to express this in their norms towards others in their social network. A more sustainable way of spreading social norms among lower SES-groups is to increase daily interactions with higher

[2] The second part of the Dutch movement guidelines advises people to participate in bone- and muscle-strengthening activities at least twice a week (Gezondheidsraad, 2017).

SES-groups, as these groups now often have separate social networks and barely interact (Volker et al., 2014). To mitigate the divisions between SES-groups, policies can seek to promote more mixed housing and encourage neighbourhood activities (Volker et al., 2014). Finally, as subjective social norm could only explain a small part of SES differences in regular LTPA, future research may further investigate which other mechanisms are driving its positive relation to regular LTPA. As neighbourhood perceptions, household factors and individual cognitions were important in the explanation of socioeconomic differences in participation in recreational walking and sports participation (Kamphuis et al., 2008; 2009), it is advised to investigate these mechanisms in the relationship between SES and regular LTPA as well.

Conclusion

This study is among the first to demonstrate that subjective social norm partially mediates the relationship between SES and regular LTPA. Results suggest that intervention and policy strategies to reduce socioeconomic differences in regular LTPA and, ultimately, in health, would benefit from raising the social norm for regular LTPA in lower SES-groups. More research into other pathways between SES and regular LTPA is needed to better understand how socioeconomic disadvantage leads to less regular LTPA.

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Appendix A

Questions from GLOBE 2014 postal questionnaire (in Dutch)

Socioeconomic status (SES)

8. Wilt u voor de genoemde personen aankruisen wat de hoogste opleiding is die hij/zij met een diploma heeft afgerond?

	a. u zelf	b. uw partner	c. uw vader	d. uw moeder
geen opleiding	☐	☐	☐	☐
lager onderwijs/basisonderwijs	☐	☐	☐	☐
lager beroepsonderwijs (bijv. VMBO, LTS, LHNO, huishoudschool, LEAO)	☐	☐	☐	☐
middelbaar algemeen onderwijs (bijv. LAVO, MULO/MAVO, 3-jaar HBS)	☐	☐	☐	☐
middelbaar beroepsonderwijs, MBO (bijv. MTS, MEAO)	☐	☐	☐	☐
voortgezet algemeen onderwijs (bijv. HAVO, VWO, HBS, MMS)	☐	☐	☐	☐
hoger beroepsonderwijs, HBO (bijv. HTS, HEAO, MO)	☐	☐	☐	☐
wetenschappelijk onderwijs, WO (bijv. universiteit)	☐	☐	☐	☐
anders, namelijk				
Niet van toepassing/weet ik niet	☐	☐	☐	☐

Role modelling, social support and subjective social norm for regular physical activity (questions 62a, 62e & 62i)

62. In hoeverre bent u het eens met de onderstaande stellingen over de mensen die belangrijk voor u zijn?	helemaal mee eens	mee eens	niet mee eens / niet mee oneens	mee oneens	helemaal mee oneens	n.v.t.
De meeste mensen die belangrijk voor mij zijn...						
a. bewegen regelmatig	☐	☐	☐	☐	☐	☐
b. eten gezond	☐	☐	☐	☐	☐	☐
c. drinken niet te veel alcohol	☐	☐	☐	☐	☐	☐
d. roken niet	☐	☐	☐	☐	☐	☐
e. vinden dat je regelmatig moet bewegen	☐	☐	☐	☐	☐	☐
f. vinden dat je gezond moet eten	☐	☐	☐	☐	☐	☐
g. vinden dat je niet te veel alcohol moet drinken	☐	☐	☐	☐	☐	☐
h. vinden dat je niet moet roken	☐	☐	☐	☐	☐	☐
i. stimuleren mij om regelmatig te bewegen	☐	☐	☐	☐	☐	☐
j. stimuleren mij om gezond te eten	☐	☐	☐	☐	☐	☐
k. stimuleren mij om niet te veel alcohol te drinken	☐	☐	☐	☐	☐	☐
l. stimuleren mij om niet te roken	☐	☐	☐	☐	☐	☐

Regular leisure-time physical activity (LTPA)

Neem in gedachten een normale week in de afgelopen maanden. Wilt u aankruisen:
- hoeveel dagen per week u de hieronder genoemde activiteiten verrichtte en,
- hoeveel uren en minuten u daar gemiddeld op zo'n dag mee bezig was en,
- hoe inspannend deze activiteit was.

→ Als u een activiteit niet hebt verricht, vult u dan een 0 in bij het aantal dagen. U hoeft de andere vragen over deze activiteit dan niet in te vullen.

29. Vrije tijd	aantal dagen **per week**	gemiddelde tijd **per dag**	inspanning (één aankruisen) **langzaam**	**gemiddeld**	**snel**
a. Wandelen	☐ dagen	☐ uur ☐☐ min	☐	☐	☐
b. Fietsen	☐ dagen	☐ uur ☐☐ min	☐	☐	☐
c. Tuinieren	☐ dagen	☐ uur ☐☐ min	☐	☐	☐
d. Klussen / doe-het-zelven	☐ dagen	☐ uur ☐☐ min	☐	☐	☐

30. Sport

Vul maximaal 4 sporten in die u beoefent, bijvoorbeeld voetbal, fitness, hardlopen.	aantal dagen **per week**	gemiddelde tijd **per dag**	inspanning (één aankruisen) **langzaam**	**gemiddeld**	**snel**
a.	☐ dagen	☐ uur ☐☐ min	☐	☐	☐
b.	☐ dagen	☐ uur ☐☐ min	☐	☐	☐
c.	☐ dagen	☐ uur ☐☐ min	☐	☐	☐
d.	☐ dagen	☐ uur ☐☐ min	☐	☐	☐

☐ Ik heb niet aan sport gedaan

Potential confounders: gender, age, marital status and country of origin

Gender

1. Bent u:	☐ vrouw ☐ man

Age

2. Wat is uw leeftijd	☐☐☐ jaar

Marital status

5. Wat is uw burgerlijke staat?	☐ gehuwd of geregistreerd partnerschap ☐ ongehuwd (en nooit gehuwd geweest) ☐ gescheiden ☐ weduwe/weduwnaar

Country of origin

7. Wilt u voor de genoemde personen aangeven in welk land hij/zij geboren is?

	a. u zelf ↓	b. uw partner ↓	c. uw vader ↓	d. uw moeder ↓
Nederland	☐	☐	☐	☐
Turkije	☐	☐	☐	☐
Marokko	☐	☐	☐	☐
Nederlandse Antillen/Aruba	☐	☐	☐	☐
Suriname	☐	☐	☐	☐
elders, namelijk				
Niet van toepassing/weet ik niet	☐	☐	☐	☐

Appendix B

Reporting of assumptions

In order to be able to make accurate and generalizable statements, data must be checked on assumptions. As the bootstrapping method of PROCESS is a non-parametric test, the assumption of normality does not need to be met. However, as PROCESS uses logistic regression for the estimation of the binary outcome regular LTPA, the assumptions of linearity (of the logit) and multicollinearity should be checked (Field, 2018). The testing of these assumptions is discussed in the following sections.

Assumption 1: linearity (of the logit)

The assumption of linearity in a logic regression entails that there is a linear relationship between any continuous predictors and the logit of the dependent variable (Field, 2018). This assumption is met when the interaction term between the predictors and their log transformations is not significant (Hosmer & Lemeshow in Field, 2018). As the interaction terms between the log transformations and SES (p = .17), role modelling (p = .22), social support (p = .88) and subjective social norm (p = .24) all have significance values greater than 0.05, the assumption of linearity of the logit has been met.

Assumption 2: multicollinearity

The assumption of multicollinearity entails that the predictors should not be measuring the same construct. The tests to see if the data met the assumption of multicollinearity indicated that multicollinearity was not a concern (SES, Tolerance = .99, VIF = 1.01; Role modelling, Tolerance = .78, VIF = 1.28; Social support, Tolerance = .69, VIF = 1.44; Subjective social norm, Tolerance = .75, VIF = 1.33).

Appendix C

Cross tabulation

An overview of the cross tabulation, to explore the differences between the group with and without missing values, can be found in table 6. The group with missing values differs significantly from the group without missing values on SES, regular LTPA and all the social influences.

Table 5

Cross tabulation by group with vs. without missing values on SES, the social influences, regular LTPA, age, gender, country of origin & marital status

	Missing (n = 452)		Non-missing (n = 2360)		Significance
	n	%	*n*	%	
Regular LTPA	452	100	2360	100	X^2 (1) = 18.00, p < .001
Is regularly active	331	73.2	1932	81.9	
Is not regularly active	121	26.8	428	18.1	
SES	428	100	2360	100	X^2 (3) = 78.62, p < .001
1-low	50	11.7	109	4.6	
2	129	30.1	488	20.7	
3	119	27.8	575	24.4	
4-high	130	30.4	1188	50.3	
Modelling	271	100	2360	100	X^2 (4) = 23.36, p < .001
Strongly disagree	8	3.0	31	1.3	
Disagree	18	6.6	175	7.4	
Neither agree nor disagree	46	17.0	581	24.6	
Agree	141	52.0	1268	53.7	
Strongly agree	58	21.4	305	12.9	
Social support	89	100	2360	100	X^2 (4) = 23.34, p < .001
Strongly disagree	16	18.0	140	5.9	
Disagree	13	14.6	387	16.4	
Neither agree nor disagree	23	25.8	806	34.2	
Agree	27	30.3	841	35.6	
Strongly agree	10	11.2	186	7.9	
Subjective social norm	254	100	2360	100	X^2 (4) = 16.49, p = .002
Strongly disagree	15	5.9	62	2.6	
Disagree	16	6.3	132	5.6	
Neither agree nor disagree	41	16.1	493	20.9	
Agree	133	52.4	1344	56.9	
Strongly agree	49	19.3	329	13.9	

Appendix D

Scientific and social relevance, interdisciplinarity

Previous research related to SES, social influence and LTPA only showed the importance of different types of social influence for LTPA without referring to SES and relative importance (e.g., Cheng et al., 2014), or demonstrated that social influence contributes to the explanation of socioeconomic differences in participating in specific types of LTPA (Kamphuis et al., 2008; 2009). However, in line with the Dutch movement guidelines, it is also important to look at time and days spent on all LTPA (i.e., regular LTPA) in the relationship between SES, social influence and LTPA, as well as the relative influence of the different types of social influence in this relationship. Therefore, the scientific relevance of this study is to contribute to this current lack of knowledge by gaining insights into the mediating roles and relative importance of role modelling, social support and subjective social norm (i.e., social influence) in the relationship between SES and regular LTPA among Dutch adults.

Understanding social influence as a mechanism underlying the socioeconomic gradient in physical inactivity is important to be able to change physical inactivity in order to improve the health of lower SES-groups in the Netherlands. When role modelling, social support and/or subjective social norm for regular physical activity mediate the relationship between SES and regular LTPA, solutions can be sought to increase social influences in lower SES-groups. For example, ´ambassadors´ of regular LTPA can be mobilized in lower SES-groups, meaning that certain people from lower SES-groups are educated about the benefits of regular physical activity and stimulated to express this in their behaviour, norms and support towards others in their social network. The social relevance of this study is therefore to possibly find solutions through which people with lower SES can be stimulated to be more physically active, and thereby improve their health.

This research is interdisciplinary as individual behaviour (i.e., regular LTPA) is hypothesized to be influenced by structural factors (i.e., SES) as well as interpersonal processes (i.e., social influence). To understand how these different socio-ecological levels interact, a theoretical framework with different insights from both sociology and social psychology has been used. The conceptual model of Berkman et al. (2000) combines insights from both disciplines as it shows the whole cascading causal process between SES and LTPA, from macro-level social-structural conditions (including socioeconomic factors) to mezzo-level social networks, to micro-level opportunities for social influence, to ultimately a greater

or lesser extent of the health-promoting behaviour LTPA. Subsequently, Bourdieu's sociological capital theory has been chosen to explain how social-structural factors influence social influence in more detail, whereas the Health Promotion Model (Pender, 2011) was used to gain more behavioural insights into how an individual's LTPA is influenced by social influences. Each discipline thus brings new insights into different parts of the cascading process, where only the combinations of insights can explain the relationship between SES, social influence and regular LTPA.

Appendix E

Ethics approval

P.O. Box 80140, 3508 TC Utrecht

The Board of the Faculty of Social and Behavioural Sciences
Utrecht University
P.O. Box 80.140
3508 TC Utrecht

Faculty of Social and Behavioural Sciences

Faculty Support Office
Ethics Committee

Visiting Address

Padualaan 14
3584 CH Utrecht

Our Description	22-0182
Telephone	030 253 46 33
E-mail	FETC-fsw@uu.nl
Date	25 January 2022
Subject	Ethical approval

ETHICAL APPROVAL

Study: Socioeconomic status, social influence and regular leisure-time physical activity: the mediating role and relative importance of modelling, social support and subjective social norms

Principal investigator: M.J. van Deventer

Supervisor: Carlijn Kamphuis

The study is approved by the Ethical Review Board of the Faculty of Social and Behavioural Sciences of Utrecht University. The approval is based on the documents sent by the researchers as requested in the form of the Ethics committee and filed under number 22-0182. The approval is valid through 27 June 2022. The approval of the Ethical Review Board concerns ethical aspects, as well as data management and privacy issues (including the GDPR). It should be noticed that any changes in the research design oblige a renewed review by the Ethical Review Board.

Yours sincerely,

Peter van der Heijden, Ph.D.
Chair
This is an automatically generated document, therefore it is not signed

Appendix F

Syntax SPSS

```
* Encoding: UTF-8.
* Encoding: .

*Open source file (titled: 'GLOBE 2014_Melody.sav').
GET
  FILE='U:\Masterproject\GLOBE 2014_Melody.sav'.
DATASET NAME DataSet2 WINDOW=FRONT.

*Save work file under new name (titled: 'GLOBE 2014_Melody_1.sav').
SAVE OUTFILE='U:\Masterproject\GLOBE 2014_Melody_1.sav'
  /COMPRESSED.

*DATASCREENING.
* Inspect variables in variable view.

*DATACLEANING.
* Prior note: names of variables cannot be longer than eight characters in PROCESS, so that is why
short names are chosen.

*Socioeconomic status ('SES')
    *Create new variable for socioeconomic status (titled: 'SES'), with 8 instead of 4 categories.
    RECODE G14v8_opl1 (1 thru 2=1) (3 thru 4=2) (5 thru 6=3) (7 thru 8=4) (9=SYSMIS)
    (10=COPY) (888=COPY) (999=COPY) INTO SES.
    *Define variable label SES.
    VARIABLE LABELS  SES 'Educational level, coded in 4 categories'.
    *Add value labels SES.
     ADD VALUE LABELS SES
        1 ´no or primary´
        2 ´lower professional or intermediate general´
        3 'intermediate professional or higher general'
        4 'higher professional or university'
        9 'different'
        10 'I do not know/not applicable'
```

```
    888 'double answers'
    999 'not filled out'.
  *Define variable level SES.
  VARIABLE LEVEL SES (NOMINAL).
  *Define missing values SES.
  MISSING VALUES SES(888,999, 10).
  *Remove unnecessary decimals.
  FORMATS SES (F8.0).
  EXECUTE.

*Role modelling ('model')
  *Create new variable for role modelling (titled: 'model'), where values are reverse coded (i.e., 5 =
  totally agree instead of totally disagree).
  RECODE G14v62_a (1=5) (2=4) (3=3) (4=2) (5=1) (6=COPY) (888=COPY) (999=COPY) INTO
  model.
  *Define variable label model.
  VARIABLE LABELS  model 'Role modelling (reverse coded): Most important others are regularly
  active'.
  *Add value labels model.
  ADD VALUE LABELS model
    1 'strongly disagree'
    2 'disagree'
    3 'neither agree nor disagree'
    4 'agree'
    5 'strongly agree'
    6 'not applicable'
    888 'double answers'
    999 'not filled out'.
 *Define variable level model.
  VARIABLE LEVEL model (ORDINAL).
  *Define missing values model.
  MISSING VALUES model(888,999, 6).
  *Remove unnecessary decimals model.
  FORMATS model (F8.0).
```

```
*Social support ('support')
  *Create new variable for social support (titled: 'support'), where values are reverse coded (i.e., 5 =
  totally agree instead of totally disagree).
  RECODE G14v62_i (1=5) (2=4) (3=3) (4=2) (5=1) (6=COPY) (888=COPY) (999=COPY) INTO
  support.
  *Define variable label support.
  VARIABLE LABELS  support 'Social support (reverse coded): Most important others stimulate me
  to be regularly active'.
  *Add value labels support.
  ADD VALUE LABELS support
    1 'strongly disagree'
    2 'disagree'
    3 'neither agree nor disagree'
    4 'agree'
    5 'strongly agree'
    6 'not applicable'
    888 'double answers'
    999 'not filled out'.
  *Define variable level support.
  VARIABLE LEVEL support (ORDINAL).
  *Define missing values support.
  MISSING VALUES support(888,999, 6).
  *Remove unnecessary decimals support.
  FORMATS support (F8.0).

*Subjective social norm ('norms')
  *Create new variable for subjective social norm (titled: 'norms'), where values are reverse coded
  (i.e., 5 = totally agree instead of totally disagree).
  RECODE G14v62_e (1=5) (2=4) (3=3) (4=2) (5=1) (6=COPY) (888=COPY) (999=COPY) INTO
  norms.
  *Define variable label  norms.
  VARIABLE LABELS  norms 'Subjective social norm (reverse coded: Most important others think
  that you should be regularly active'.
  *Add value labels norms.
  ADD VALUE LABELS norms
    1 'strongly disagree'
    2 'disagree'
```

```
    3 'neither agree nor disagree'
    4 'agree'
    5 'strongly agree'
    6 'not applicable'
    888 'double answers'
    999 'not filled out'.
  *Define variable level norms.
  VARIABLE LEVEL norms (ORDINAL).
  *Define missing values norms.
  MISSING VALUES norms (888,999, 6).
  *Remove unnecessary decimals norms.
  FORMATS norms (F8.0).
  EXECUTE.

*Country of origin ('country')
  *Create new variable for country of origin (titled: 'country'), with 2 instead of 6 categories.
  RECODE G14v7_gbl1 (1=1)  (2 thru 6=2) (7=Copy) (888=Copy) (999=Copy) INTO country.
  *Define variable label country.
  VARIABLE LABELS  country 'Country of origin, coded in 2 categories'.
  *Add value labels country.
  ADD VALUE LABELS country
    1 'Netherlands'
    2 'another country'
    7 'not applicable/I do not know'
    888 'double answers'
    999 'not filled out'.
  *Define variable level country.
  VARIABLE LEVEL country (NOMINAL).
  *Define missing values country.
  MISSING VALUES country(888,999, 7).
  *Remove unnecessary decimals country.
  FORMATS country (F8.0).

* Marital status ('mstatus')
  *Create new variable for marital status (titled: 'mstatus'), with 2 instead of 4 categories.
  RECODE G14v5 (1=1) (2 thru 4=2) (888=Copy) (999=Copy) INTO mstatus.
  *Define variable label mstatus.
```

```
VARIABLE LABELS  mstatus 'Marital status, coded in 2 categories'.
*Add value labels mstatus.
ADD VALUE LABELS mstatus
   1 'married/registered partnership'
   2 'unmarried/divorced/widowed'
   888 'double answers'
   999 'not filled out'.
*Define missing values mstatus.
MISSING VALUES mstatus(888,999).
*Remove unnecessary decimals mstatus.
FORMATS mstatus (F8.0).
EXECUTE.

*Regular LTPA:
 *New variables for days, hours and minutes spent on walking, cycling, gardening, doing odd jobs &
  sports, where missing values are coded as 0 minutes (otherwise total amount of activity cannot be
  calculated correctly).

  *Walking:
    *New variable walking_days.
    RECODE G14v29_a_dag (SYSMIS=0) (ELSE=Copy) INTO walking_days.
    *Define variable label walking_days.
    VARIABLE LABELS  walking_days 'Total amount  of days per week spent on walking'.
    *Define variable level walking_days.
    VARIABLE LEVEL walking_days (SCALE).
    *Remove unnecessary decimals walking_days.
    FORMATS walking_days (F8.0).

    *New variable walking_hours.
    RECODE G14v29_a_uur (SYSMIS=0) (ELSE=Copy) INTO walking_hours.
    *Define variable label walking_hours.
    VARIABLE LABELS walking_hours 'Average amount of hours per day spent on walking'.
    *Define variable level walking_hours.
    VARIABLE LEVEL walking_hours (SCALE).
    *Remove unnecessary decimals walking_hours.
    FORMATS walking_hours (F8.0).
```

```
*New variable walking_minutes.
RECODE G14v29_a_min (SYSMIS=0) (ELSE=Copy) INTO walking_minutes.
*Define variable label walking_minutes.
VARIABLE LABELS  walking_minutes 'Average amount of minutes per day spent on walking'.
*Define variable level walking_minutes.
VARIABLE LEVEL walking_minutes (SCALE).
*Remove unnecessary decimals walking_minutes.
FORMATS walking_minutes (F8.0).

*New variable for total amount of minutes spent on walking per week (titled:
'walking_total_week').
COMPUTE walking_total_week=walking_days * (walking_hours * 60 + walking_minutes).
*Define variable label walking_total_week.
VARIABLE LABELS  walking_total_week 'Total amount of minutes per week spent on
walking'.
*Define variable level walking_total_week.
VARIABLE LEVEL walking_total_week (SCALE).
*Remove unnecessary decimals walking_total_week.
FORMATS walking_total_week (F8.0).
EXECUTE.

*Cycling:
*New variable cycling_days.
RECODE G14v29_b_dag (SYSMIS=0) (ELSE=Copy) INTO cycling_days.
*Define variable label cycling_days.
VARIABLE LABELS  cycling_days 'Total amount  of days per week spent on cycling'.
*Define variable level cycling_days.
VARIABLE LEVEL cycling_days (SCALE).
*Remove unnecessary decimals cycling_days.
FORMATS cycling_days (F8.0).

*New variable cycling_hours.
RECODE G14v29_b_uur (SYSMIS=0) (ELSE=Copy) INTO cycling_hours.
*Define variable label cycling_hours.
VARIABLE LABELS cycling_hours 'Average amount of hours per day spent on walking'.
*Define variable level cycling_hours.
VARIABLE LEVEL cycling_hours (SCALE).
```

```
*Remove unnecessary decimals cycling_hours.
FORMATS cycling_hours (F8.0).
*New variable cycling_minutes.
RECODE G14v29_b_min (SYSMIS=0) (ELSE=Copy) INTO cycling_minutes.
*Define variable label cycling_minutes.
VARIABLE LABELS  cycling_minutes 'Average amount of minutes per day spent on cycling'.
*Define variable level cycling_minutes.
VARIABLE LEVEL cycling_minutes (SCALE).
*Remove unnecessary decimals cycling_minutes.
FORMATS cycling_minutes (F8.0).

 *New variable for total amount of minutes spent on cycling per week (titled:
'cycling_total_week'). .
COMPUTE cycling_total_week=cycling_days * (cycling_hours * 60 + cycling_minutes).
*Define variable label cycling_total_week.
VARIABLE LABELS  cycling_total_week 'Total amount of minutes per week spent on cycling'.
*Define variable level cycling_total_week.
VARIABLE LEVEL cycling_total_week (SCALE).
*Remove unnecessary decimals cycling_total_week.
FORMATS cycling_total_week (F8.0).
EXECUTE.

*Gardening:
*New variable gardening_days.
RECODE G14v29_c_dag (SYSMIS=0) (ELSE=Copy) INTO gardening_days.
*Define variable label gardening_days.
VARIABLE LABELS  gardening_days 'Total amount  of days per week spent on gardening'.
*Define variable level gardening_days.
VARIABLE LEVEL gardening_days (SCALE).
*Remove unnecessary decimals gardening_days.
FORMATS gardening_days (F8.0).

*New variable gardening_hours.
RECODE G14v29_c_uur (SYSMIS=0) (ELSE=Copy) INTO gardening_hours.
*Define variable label gardening_hours.
VARIABLE LABELS gardening_hours 'Average amount of hours per day spent on gardening'.
*Define variable level gardening_hours.
```

```
VARIABLE LEVEL gardening_hours (SCALE).
*Remove unnecessary decimals gardening_hours.
FORMATS gardening_hours (F8.0).

*New variable gardening_minutes.
RECODE G14v29_c_min (SYSMIS=0) (ELSE=Copy) INTO gardening_minutes.
*Define variable label gardening_minutes.
VARIABLE LABELS  gardening_minutes 'Average amount of minutes per day spent on
gardening'.
*Define variable level gardening_minutes.
VARIABLE LEVEL gardening_minutes (SCALE).
*Remove unnecessary decimals gardening_minutes.
FORMATS gardening_minutes (F8.0).

*New variable for total amount of minutes spent on gardening per week (titled:
'gardening_total_week'). .
COMPUTE gardening_total_week=gardening_days * (gardening_hours * 60 +
gardening_minutes).
*Define variable label gardening_total_week.
VARIABLE LABELS  gardening_total_week 'Total amount of minutes per week spent on
gardening'.
*Define variable level gardening_total_week.
VARIABLE LEVEL gardening_total_week (SCALE).
*Remove unnecessary decimals gardening_total_week.
FORMATS gardening_total_week (F8.0).
EXECUTE.

*Doing odd jobs:
*New variable oddjobs_days.
RECODE G14v29_d_dag (SYSMIS=0) (ELSE=Copy) INTO oddjobs_days.
*Define variable label oddjobs_days.
VARIABLE LABELS  oddjobs_days 'Total amount  of days per week spent on doing odd jobs'.
*Define variable level oddjobs_days.
VARIABLE LEVEL oddjobs_days (SCALE).
*Remove unnecessary decimals oddjobs_days.
FORMATS oddjobs_days (F8.0).
```

```
*New variable oddjobs_hours.
RECODE G14v29_d_uur (SYSMIS=0) (ELSE=Copy) INTO oddjobs_hours.
*Define variable label oddjobs_hours.
VARIABLE LABELS oddjobs_hours 'Average amount of hours per day spent on doing odd
jobs'.
*Define variable level oddjobs_hours.
 VARIABLE LEVEL oddjobs_hours (SCALE).
*Remove unnecessary decimals oddjobs_hours.
FORMATS oddjobs_hours (F8.0).

*New variable oddjobs_minutes.
RECODE G14v29_d_min (SYSMIS=0) (ELSE=Copy) INTO oddjobs_minutes.
*Define variable label oddjobs_minutes.
VARIABLE LABELS  oddjobs_minutes 'Average amount of minutes per day spent on doing odd
jobs'.
*Define variable level oddjobs_minutes.
VARIABLE LEVEL oddjobs_minutes (SCALE).
*Remove unnecessary decimals gardening_minutes.
FORMATS oddjobs_minutes (F8.0).

*New variable for total amount of minutes spent on doing odd jobs per week (titled:
'oddjobs_total_week').
COMPUTE oddjobs_total_week=oddjobs_days * (oddjobs_hours * 60 + oddjobs_minutes).
*Define variable label oddjobs_total_week.
VARIABLE LABELS  oddjobs_total_week 'Total amount of minutes per week spent on doing
odd jobs'.
*Define variable level oddjobs_total_week.
VARIABLE LEVEL oddjobs_total_week (SCALE).
*Remove unnecessary decimals oddjobs_total_week.
FORMATS oddjobs_total_week (F8.0).
EXECUTE.

*Sport 1:
*New variable sport1_days.
RECODE G14v30_a_dag (SYSMIS=0) (ELSE=Copy) INTO sport1_days.
*Define variable label sport1_days.
VARIABLE LABELS  sport1_days 'Total amount  of days per week spent on sport 1'.
```

```
*Define variable level sport1_days.
VARIABLE LEVEL sport1_days (SCALE).
*Remove unnecessary decimals sport1_days.
FORMATS sport1_days (F8.0).

*New variable sport1_hours.
RECODE G14v30_a_uur (SYSMIS=0) (ELSE=Copy) INTO sport1_hours.
*Define variable label sport1_hours.
VARIABLE LABELS sport1_hours 'Average amount of hours per day spent on sport 1'.
*Define variable level sport1_hours.
 VARIABLE LEVEL sport1_hours (SCALE).
*Remove unnecessary decimals sport1_hours.
FORMATS sport1_hours (F8.0).

*New variable sport1_minutes.
RECODE G14v30_a_min (SYSMIS=0) (ELSE=Copy) INTO sport1_minutes.
*Define variable label sport1_minutes.
VARIABLE LABELS  sport1_minutes 'Average amount of minutes per day spent on sport 1'.
*Define variable level sport1_minutes.
VARIABLE LEVEL sport1_minutes (SCALE).
*Remove unnecessary decimals sport1_minutes.
FORMATS sport1_minutes (F8.0).

*New variable for total amount of minutes spent on sport 1 per week (titled: 'sport1_total_week').
COMPUTE sport1_total_week=sport1_days * (sport1_hours * 60 + sport1_minutes).
*Define variable label sport1_total_week.
VARIABLE LABELS  sport1_total_week 'Total amount of minutes per week spent on sport 1'.
*Define variable level sport1_total_week.
VARIABLE LEVEL sport1_total_week (SCALE).
*Remove unnecessary decimals sport1_total_week.
FORMATS sport1_total_week (F8.0).
EXECUTE.

*Sport 2:
*New variable sport2_days.
RECODE G14v30_b_dag (SYSMIS=0) (ELSE=Copy) INTO sport2_days.
*Define variable label sport2_days.
```

```
VARIABLE LABELS  sport2_days 'Total amount  of days per week spent on sport 2'.
*Define variable level sport2_days.
VARIABLE LEVEL sport2_days (SCALE).
*Remove unnecessary decimals sport2_days.
FORMATS sport2_days (F8.0).

*New variable sport2_hours.
RECODE G14v30_b_uur (SYSMIS=0) (ELSE=Copy) INTO sport2_hours.
*Define variable label sport2_hours.
VARIABLE LABELS sport2_hours 'Average amount of hours per day spent on sport 2'.
*Define variable level sport2_hours.
VARIABLE LEVEL sport2_hours (SCALE).
*Remove unnecessary decimals sport2_hours.
FORMATS sport2_hours (F8.0).

*New variable sport2_minutes.
RECODE G14v30_b_min (SYSMIS=0) (ELSE=Copy) INTO sport2_minutes.
*Define variable label sport2_minutes.
VARIABLE LABELS  sport2_minutes 'Average amount of minutes per day spent on sport 2'.
*Define variable level sport2_minutes.
VARIABLE LEVEL sport2_minutes (SCALE).
*Remove unnecessary decimals sport2_minutes.
FORMATS sport2_minutes (F8.0).
.
*New variable for total amount of minutes spent on sport 2 per week (titled:
'sport2_total_week')..
COMPUTE sport2_total_week=sport2_days * (sport2_hours * 60 + sport2_minutes).
*Define variable label sport2_total_week.
VARIABLE LABELS  sport2_total_week 'Total amount of minutes per week spent on sport 2'.
*Define variable level sport2_total_week.
VARIABLE LEVEL sport2_total_week (SCALE).
*Remove unnecessary decimals sport2_total_week.
FORMATS sport2_total_week (F8.0).
EXECUTE.
```

```
*Sport 3:
  *New variable sport3_days.
  RECODE G14v30_c_dag (SYSMIS=0) (ELSE=Copy) INTO sport3_days.
  *Define variable label sport3_days.
  VARIABLE LABELS  sport3_days 'Total amount  of days per week spent on sport 3'.
  *Define variable level sport3_days.
  VARIABLE LEVEL sport3_days (SCALE).
  *Remove unnecessary decimals sport3_days.
  FORMATS sport3_days (F8.0).

  *New variable sport3_hours.
  RECODE G14v30_c_uur (SYSMIS=0) (ELSE=Copy) INTO sport3_hours.
  *Define variable label sport3_hours.
  VARIABLE LABELS sport3_hours 'Average amount of hours per day spent on sport 3'.
  *Define variable level sport3_hours.
   VARIABLE LEVEL sport3_hours (SCALE).
  *Remove unnecessary decimals sport3_hours.
  FORMATS sport3_hours (F8.0).

  *New variable sport3_minutes.
  RECODE G14v30_c_min (SYSMIS=0) (ELSE=Copy) INTO sport3_minutes.
  *Define variable label sport3_minutes.
  VARIABLE LABELS  sport3_minutes 'Average amount of minutes per day spent on sport 3'.
  *Define variable level sport3_minutes.
  VARIABLE LEVEL sport3_minutes (SCALE).
  *Remove unnecessary decimals sport3_minutes.
  FORMATS sport3_minutes (F8.0).

  *New variable for total amount of minutes spent on sport 3 per week (titled: 'sport3_total_week').
  COMPUTE sport3_total_week=sport3_days * (sport3_hours * 60 + sport3_minutes).
  *Define variable label sport3_total_week.
  VARIABLE LABELS  sport3_total_week 'Total amount of minutes per week spent on sport 3'.
  *Define variable level sport3_total_week.
  VARIABLE LEVEL sport3_total_week (SCALE).
  *Remove unnecessary decimals sport3_total_week.
  FORMATS sport3_total_week (F8.0).
  EXECUTE.
```

```
*Sport 4:
  *New variable sport4_days.
  RECODE G14v30_d_dag (SYSMIS=0) (ELSE=Copy) INTO sport4_days.
  *Define variable label sport4_days.
  VARIABLE LABELS  sport4_days 'Total amount  of days per week spent on sport 4'.
  *Define variable level sport4_days.
  VARIABLE LEVEL sport4_days (SCALE).
  *Remove unnecessary decimals sport4_days.
  FORMATS sport4_days (F8.0).

  *New variable sport4_hours.
  RECODE G14v30_d_uur (SYSMIS=0) (ELSE=Copy) INTO sport4_hours.
  *Define variable label sport4_hours.
  VARIABLE LABELS sport4_hours 'Average amount of hours per day spent on sport 4'.
  *Define variable level sport4_hours.
   VARIABLE LEVEL sport4_hours (SCALE).
  *Remove unnecessary decimals sport4_hours.
  FORMATS sport4_hours (F8.0).

  *New variable sport4_minutes.
  RECODE G14v30_d_min (SYSMIS=0) (ELSE=Copy) INTO sport4_minutes.
  *Define variable label sport4_minutes.
  VARIABLE LABELS  sport4_minutes 'Average amount of minutes per day spent on sport 4'.
  *Define variable level sport4_minutes.
  VARIABLE LEVEL sport4_minutes (SCALE).
  *Remove unnecessary decimals sport4_minutes.
  FORMATS sport4_minutes (F8.0).

  *New variable for total amount of minutes spent on sport 4 per week (titled:
  'sport4_total_week')..
  COMPUTE sport4_total_week=sport4_days * (sport4_hours * 60 + sport4_minutes).
  *Define variable label sport4_total_week.
  VARIABLE LABELS  sport4_total_week 'Total amount of minutes per week spent on sport 4'.
  *Define variable level sport4_total_week.
  VARIABLE LEVEL sport4_total_week (SCALE).
  *Remove unnecessary decimals sport4_total_week.
  FORMATS sport4_total_week (F8.0).
```

```
EXECUTE.

*New variables for total amount of days and minutes spent on all LTPA per week.
 *New variable for total amount of days spent on LTPA per week.
 COMPUTE LTPA_days_week=walking_days + cycling_days + gardening_days + oddjobs_days +
 sport1_days + sport2_days + sport3_days + sport4_days.
 *Define variable label LTPA_days_week.
 VARIABLE LABELS  LTPA_days_week 'Total amount of days per week spent on all LTPA'.
 *Define variable level LTPA_days_week.
 VARIABLE LEVEL LTPA_days_week (SCALE).
 *Remove unnecessary decimals LTPA_days_week.
 FORMATS LTPA_days_week (F8.0).

 *New variable for total amount of minutes spent on all LTPA per week.
 COMPUTE LTPA_minutes_week=walking_total_week + cycling_total_week +
 gardening_total_week + oddjobs_total_week + sport1_total_week + sport2_total_week +
 sport3_total_week + sport4_total_week.
*Define variable label LTPA_minutes_week.
 VARIABLE LABELS  LTPA_minutes_week 'Total amount of minutes per week spent on all
 LTPA'.
 *Define variable level LTPA_minutes_week.
 VARIABLE LEVEL LTPA_minutes_week (SCALE).
 *Remove unnecessary decimals LTPA_minutes_week.
 FORMATS LTPA_minutes_week (F8.0).

*New variables for complying with at least 150 minutes per week (titled 'LTPA_MG1') and
 complying with both at least 150, spread over at least 2 days (titled 'LTPA_MG)
 *New variable for complying or not complying to the movement guidelines (MG), part 1: at least
 150 minutes LTPA per week.
 RECODE LTPA_minutes_week (0 thru 149=0) (150 thru Highest=1) INTO LTPA_MG1.
 *Define variable label LTPA_MG1.
 VARIABLE LABELS LTPA_MG1 'LTPA movement guidelines, part 1: complying or not
 complying with 150 minutes LTPA per week'.
  *Define variable level LTPA_MG1.
 VARIABLE LEVEL LTPA_MG1 (NOMINAL).
 *Remove unnecessary decimals LTPA_MG1.
 FORMATS LTPA_MG1(F8.0).
```

```
EXECUTE.

*New variables for complying or not complying to the Dutch movement guidelines (MG) of being
PA at least 150 minutes per week, spread over several days.
COMPUTE LTPA_MG=LTPA_MG1=1 AND LTPA_days_week  >= 2.
* Define variable label LTPA_MG.
VARIABLE LABELS   LTPA_MG 'LTPA movement guidelines, complying or not complying with
150 minutes LTPA per week, spread over at least 2 days'.
* Define variable level LTPA_MG.
VARIABLE LEVEL LTPA_MG (NOMINAL).
* Remove unnecessary decimals LTPA_MG.
FORMATS LTPA_MG(F8.0).
EXECUTE.

*DESCRIPTIVES/FREQUENCIES:
*Run descriptives for all participants to get an indication of missing data.
DESCRIPTIVES VARIABLES=G14v1 G14v2 SES model norms support country mstatus
LTPA_MG
  /STATISTICS=MEAN STDDEV MIN MAX.

*Run frequencies for all participants to get a more specific view of missing data.
FREQUENCIES VARIABLES=G14v1 SES model norms support country mstatus
  /ORDER=ANALYSIS.

*Run descriptives/frequencies for all SES groups, without missing data:
  *Select cases without missing values on all variables.
    USE ALL.
      COMPUTE filter_$=(NMISS(SES, model, norms, support, LTPA_MG, G14v1, G14v2,
      country, mstatus) < 1).
      VARIABLE LABELS filter_$ 'NMISS(SES, model, norms, support, '+ 'LTPA_MG, G14v1,
      G14v2, country, mstatus) < 1 (FILTER)'.
      VALUE LABELS filter_$ 0 'Not Selected' 1 'Selected'.
      FORMATS filter_$ (f1.0).
      FILTER BY filter_$.
    EXECUTE.
```

```
*Analyze frequencies for sample.
     FREQUENCIES VARIABLES=SES G14v1 mstatus country LTPA_MG
     /ORDER=ANALYSIS.

*Analyze descriptives for sample.
   DESCRIPTIVES VARIABLES=G14v2 model support norms
  /STATISTICS=MEAN STDDEV MIN MAX.

*Analyze age of participants by gender.
   SORT CASES  BY G14v1.
   SPLIT FILE LAYERED BY G14v1.

   DESCRIPTIVES VARIABLES=G14v2
  /STATISTICS=MEAN STDDEV MIN MAX.

   SPLIT FILE OFF.

*Run descriptives/frequencies sorted by SES groups.
   *Sort by SES.
   SORT CASES  BY SES.
   SPLIT FILE LAYERED BY SES.

   *Analyze frequencies by SES.
   FREQUENCIES VARIABLES= G14v1 mstatus country LTPA_MG
   /ORDER=ANALYSIS.

   *Analyze descriptives by SES.
   DESCRIPTIVES VARIABLES=G14v2 model support norms
    /STATISTICS=MEAN STDDEV MIN MAX.

   *End split file.
   SPLIT FILE OFF.

*PEARSON CORRELATION ANALYSIS.
 CORRELATIONS
 /VARIABLES=SES LTPA_MG model support norms G14v1 G14v2 mstatus country
 /PRINT=TWOTAIL NOSIG FULL
```

```
 /MISSING=PAIRWISE.

*ASSUMPTIONS.
   *Checking for linearity of the logit. Interactions terms not significant, so no violation of the
   linearity assumption.
   COMPUTE LnSES=LN(SES).
   COMPUTE Lnmodel=LN(model).
   COMPUTE Lnsupport=LN(support).
   COMPUTE Lnnorms=LN(norms).
   EXECUTE.

   LOGISTIC REGRESSION VARIABLES LTPA_MG
   /METHOD=ENTER SES model support norms LnSES*SES Lnmodel*model Lnsupport*support
   Lnnorms*norms
   /CRITERIA=PIN(.05) POUT(.10) ITERATE(20) CUT(.5).

   *Checking for multicollinearity. VIF and tolerance no problem.
   REGRESSION
     /MISSING LISTWISE
     /STATISTICS COEFF OUTS R ANOVA COLLIN TOL
     /CRITERIA=PIN(.05) POUT(.10)
     /NOORIGIN
     /DEPENDENT LTPA_MG
     /METHOD=ENTER SES model norms support.

*LOGISTIC REGRESSIOIN: SES AND REGULAR LTPA (unadjusted and adjusted for age, gender
and country of origin).
LOGISTIC REGRESSION VARIABLES LTPA_MG
 /METHOD=ENTER SES
 /METHOD=ENTER G14v1 G14v2 country
 /CONTRAST (SES)=Indicator(1)
 /CONTRAST (G14v1)=Indicator(1)
 /CONTRAST (country)=Indicator(1)
 /PRINT=CI(95)
 /CRITERIA=PIN(0.05) POUT(0.10) ITERATE(20) CUT(0.5).
```

*MEDIATION ANALYSIS (for all social influences seperately).

*Mediation analysis role modelling

Analyse → Regression → PROCESS, Y = LTPA_MG, X = SES, mediator = model, confouders = G14v1 (=gender) G14v2 (=age) and country, model number = 4, number of bootstrap samples = 1000, confidence intervals = 95, OK.

*Mediation analysis social support

Analyse → Regression → PROCESS, Y = LTPA_MG, X = SES, mediator = support, confouders = G14v1 (=gender) G14v2 (=age) and country, model number = 4, number of bootstrap samples = 1000, confidence intervals = 95, OK.

*Mediation analysis subjective social norm

Analyse → Regression →PROCESS, Y = LTPA_MG, X = SES, mediator = norms, confouders = G14v1 (=gender) G14v2 (=age) and country, model number = 4, number of bootstrap samples = 1000, confidence intervals = 95, OK.

*LOGISTIC REGRESSION SEPERATE SOCIAL INFLUENCES

*Logistic regression with role modelling.

```
LOGISTIC REGRESSION VARIABLES LTPA_MG
  /METHOD=ENTER SES G14v1 G14v2 country model
  /CONTRAST (SES)=Indicator(1)
  /CONTRAST (G14v1)=Indicator(1)
  /CONTRAST (country)=Indicator(1)
  /PRINT=CI(95)
  /CRITERIA=PIN(0.05) POUT(0.10) ITERATE(20) CUT(0.5).
```

*Logistic regression with social support.

```
LOGISTIC REGRESSION VARIABLES LTPA_MG
  /METHOD=ENTER SES G14v1 G14v2 country support
  /CONTRAST (SES)=Indicator(1)
  /CONTRAST (G14v1)=Indicator(1)
  /CONTRAST (country)=Indicator(1)
  /PRINT=CI(95)
  /CRITERIA=PIN(0.05) POUT(0.10) ITERATE(20) CUT(0.5).
```

*Logistic regression with subjective social norm.

```
LOGISTIC REGRESSION VARIABLES LTPA_MG
```

```
  /METHOD=ENTER SES G14v1 G14v2 country norms
  /CONTRAST (SES)=Indicator(1)
  /CONTRAST (G14v1)=Indicator(1)
  /CONTRAST (country)=Indicator(1)
  /PRINT=CI(95)
  /CRITERIA=PIN(0.05) POUT(0.10) ITERATE(20) CUT(0.5).

*LOGISTIC REGRESSION WITH ALL SOCIAL INFLUENCES.
 LOGISTIC REGRESSION VARIABLES LTPA_MG
  /METHOD=ENTER SES G14v1 G14v2 country model support norms
  /CONTRAST (SES)=Indicator(1)
  /CONTRAST (G14v1)=Indicator(1)
  /CONTRAST (country)=Indicator(1)
  /PRINT=CI(95)
  /CRITERIA=PIN(0.05) POUT(0.10) ITERATE(20) CUT(0.5).

*CROSSTABULATIONS MISSING VS NON-MISSING GROUP.
 *Create new binary variable for comparing group with and without missing values.
   COMPUTE MISSING=(NMISS(SES, model, norms, support, LTPA_MG, G14v1,
   G14v2, country, mstatus) < 1) = 1.
   EXECUTE.

 *Select all cases.
 FILTER OFF.
 USE ALL.
 EXECUTE.

 *Crosstabs to compare group with and without missing values.
 CROSSTABS
  /TABLES=LTPA_MG SES model norms support BY MISSING
  /FORMAT=AVALUE TABLES
  /STATISTICS=CHISQ
  /CELLS=COUNT EXPECTED COLUMN SRESID
  /COUNT ROUND CELL.
```