South African Journal for Research in Sport, Physical Education and Recreation, 2019, 41(2): 117 - 129.
Suid-Afrikaanse Joernaal vir Navorsing in Sport, Liggaamlike Opvoedkunde en Ontspanning, 2019, 41(2): 117 - 129.
ISBN: 0379-9069

SOCIAL CAPITAL AND PHYSICAL ACTIVITY PARTICIPATION AMONG TURKISH ADOLESCENTS IN URBAN CENTRES: A PRELIMINARY STUDY

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ABSTRACT

This study investigated the association between social capital (SC) indicators and physical activity (PA) participation among high school aged Turkish adolescents, in the mid-size urban city centre. Participants included 228 female and 292 male adolescents. Short form of International Physical Activity Questionnaire was used to measure overall and moderate-to-vigorous physical activity participation (OPAP & MVPAP) status as dependent variables. Self-perceived family, neighbourhood and school SC. Weight status, self-perceived socioeconomic status (SES, and self-rated health were included in the analyses. Chi-square test results revealed that OPAP and MVPAP status were significantly different between males and females. Multiple binary logistic regression analyses indicated that family support was positively associated with OPAP, while students' interpersonal trust was inversely associated with OPAP and MVPAP among females. Self-rated health was associated with OPAP and MVPAP for the overall sample and male adolescents. SC indicators are associated with physical activity participation in various ways for female adolescents, yet are not associated with physical activity participation among male adolescents. These results could be useful for interventions and policies to increase and shift SC for the promotion of physical activity participation in adolescents in developing country context.

***Keywords*:** Social capital; Physical activity; Adolescent health; Turkey; Developing country.

INTRODUCTION

Physical activity (PA) was emphasised as a crucial factor for maintaining optimal growth and development and metabolic function of the youth (Strong *et al.*, 2005; Hills *et al.*, 2007). Despite extensive health benefits of PA, sedentary behaviour is a major epidemic and a cause of various medical conditions among children and adolescents (Janssen, 2007; Sisson *et al.*, 2010). The majority of youth population does not meet the international guidelines for PA in developed countries (Kann *et al.*, 2016) and PA level tends to decrease during adolescents (Brodersen *et al.*, 2007). To illustrate, only 7.5% youth in early adolescent period and 5.1% youth in late adolescent period meet the PA guidelines in the U.S. (Katzmarzyk *et al.*, 2016).

The PA literature focused on youths has extensively examined the environmental determinants of PA participation, such as school physical environment (Sallis *et al.*, 2001), perceived physical environment (Motl *et al.*, 2005) and time spent outdoors (Cleland *et al.*, 2008). Although the physical environment is extremely important in PA participation, social and affective factors are also necessities to explicate PA and sedentary behaviour. Social relationships are emphasised as a vital factor of individual health-related behaviours, such as drug use, diet and sedentary behaviour (Currie *et al.*, 2012). In line with this notion, the recent attention of health studies has focused on social capital (SC) defined as a "social networks and the associated norms of reciprocity and trustworthiness" (Putnam, 2007:1). SC has become a one of the key concept in social epidemiology and health studies (Moore & Kawachi, 2017).

Although various forms and contexts of SC has emerged, reciprocity, interpersonal trust, exchange of social support and interpersonal trust are determinants of SC (Van der Gaag & Webber, 2008). These determinants are crucial social factors on health behaviour. To illustrate, Kawachi *et al.* (1999) explained that SC indicators influences health outcomes through a decline in violent crime, psychosocial stress and influencing the norms related to health-related behaviours. Researchers have also investigated the associations of SC with numerous health outcomes and PA participation among various populations from different cultures (Lindstrom *et al.*, 2003; Ueshima *et al.*, 2010; Ho *et al.*, 2018; Novak *et al.*, 2018). Higher perceptions of SC might lead to higher PA participation among adolescents through decreasing juvenile delinquency by informal social control, improving access to PA opportunities by improving collective efficacy and promoting PA participation with associated norms in the society (Ueshima *et al.*, 2010). Similar to PA participation, indicators of SC perception might be changed with respect to social and cultural aspects of the living area, in turn, these indicators are associated with health in various ways (Tobiasz-Adamczyk & Zawisza, 2017).

Most of the studies investigating the association of SC indicators and health behaviour, such as physical activity have been conducted in developed country context resulting in lack of comprehension related to communities from developing country context. Similar to developed countries, the World Health Organization report (World Health Organization, 2014) indicated that physical inactivity epidemic is rife with 80% physical inactivity ratio among Turkish adolescents. Moreover, urban lifestyle brings a more sedentary behaviour rather than rural life among the youth (Joens-Matre *et al.*, 2008), and according to Turkish Statistical Institution (Turkish Statistical Institution, 2018), 92.5% of the population lives in urban areas in Turkey. Accordingly, Turkish children who live in an urban environment are more inactive and obese, than children in rural areas and in turn, urban children have significantly lower physical fitness (Özdirenç *et al.*, 2005).

PURPOSE OF RESEARCH AND HYPOTHESIS

Comprehending the SC indicators that influences the acquisition of PA participation has become an important topic to promote PA among Turkish society, especially for young people in urban. The purpose of this study was to investigate the association between various SC indicators and PA participation among Turkish adolescents who live in the mid-sized urban city. It was hypothesised that SC indicators like school, family and neighbourhood would be associated with PA participation among Turkish adolescents in cities, and those adolescents who report higher SC perception in all indicators would have higher odds for PA participation.

METHODOLOGY

Study design

A cross-sectional experimental design was utilised to understand the association between physical activity participation and SC indicators among urban high-school students in Eskisehir city centre. The data collection tool was implemented to randomly selected ten high schools out of 74. The independent variables of the study were family, neighbourhood and school SC perceptions, whereas self-rated health, obesity/overweight status determined by body mass index (BMI) and socioeconomic status (SES) were confounders. Lastly, overall physical activity participation (OPAP) and moderate-to-vigorous physical activity participation (MVPAP) were the dependent variables in this study.

Ethical considerations

Ethical Board Committee of the Anadolu University approved this study (Protocol 29192). Informed consent forms were provided by all participants and their parents.

Sample

In total, 520 adolescents aged 14-18 years voluntarily participated in this study. Researchers invited 20 students from each grade of each school, and 800 adolescents were willing to participate in this study. The 520 high-school students that participated consisted of 228 female (15.4±1.7 years, 54.2±8.3 kg, 164.9±6.7 cm, 19.9±2.7kg/m^2) and 292 male (15.0±1.6 years, 63.3.9±10.9kg, 173.6±7.0cm, 20.9±2.6kg/m^2) adolescents. The participation rate was 65.0%.

Data collection

Physical activity participation

The outcome physical activity participation was measured by the International Physical Activity Questionnaire (IPAQ-Short Form) which indicates the total PA in the last seven days (Craig *et al.*, 2003). Prior to the study, the questionnaire was adapted, validated and translated into Turkish (Saglam *et al.*, 2010). This questionnaire consists of three physical activity sections, namely vigorous, moderate and walking. Physical activity participation variable was dichotomised into YES/NO for at least 60 minutes daily participation for OPAP and MVPAP (U.S. Department of Health and Human Services, 2008). The moderate and vigorous physical activity sections were accounted for MVPAP, while all sections were accounted for OPAP. Self-reported weekly physical activity time divided by seven to compute average daily participation time.

Social capital perception

SC perceptions of the school, neighbourhood, and family settings were measured by the survey of Furuta *et al.* (2012). All questions were analysed as independent variables. Firstly, school SC was assessed by means of three questions which are related to (I) interpersonal trust between teachers and students (‘Do you feel teachers and students trust each other in your high school?’), (II) students’ interpersonal trust (‘Do you feel students trust each other in your high school?’) and (III) collaboration between students (‘Do you feel students collaborate with one another in your high school?’). Secondly, neighbourhood SC was evaluated by two questions that are related to (I) trust in the neighbourhood (‘Do you feel people trust one another in your neighbourhood?’) and (II) informal social control (‘Do you feel that your neighbours step in to

criticise deviant behaviour among high school students?'). Lastly, family SC was evaluated by the single question ('Do you feel your family understands and gives attention to you during high school?'). All questions were on the 5-Likert scale ranging from 'Strongly Disagree' to 'Strongly Agree'. The 'disagree' and 'strongly disagree' responses were combined to create a dichotomous variable indicating lower perceived SC. All SC indicators were transformed to dichotomous variables as high ('agree' and 'strongly agree') and low ('disagree', 'strongly disagree', 'neither agree nor disagree'), since single aggregate measurement would not allow explicating features of SC. All of the questions were analysed as a single indicator of different aspects of SC.

Confounders

Self-rated health, self-perceived SES, and objectively measured BMI data were collected as a potential confounder that is theoretically associated with PA participation and SC (Novak *et al.*, 2015). Participants answered a single question related to self-perceived health ('How do you perceive your health'?) with response ranging from very poor to excellent. The responses were dichotomised as good (good, excellent) and bad (very poor, poor, and regular) health status. Self-perceived SES was obtained regarding household income and dichotomised as a middle/high SES group and as a low SES group, based on the poverty line reported by the Confederation of Turkish Trade Unions (2017). BMI was considered as a categorical variable (overweight/obese, normal) in the statistics, calculated as weight (measured with Tanita BC-601, Japan) in kilograms divided by standing height (measured with Leicester height measurement MKII, Child Growth Foundation) in metres squared. Specific cut-off points for BMI based on age and gender presented by Cole *et al.* (2000) were used for classification.

Data analysis

All categorical comparisons between genders were calculated via the chi-square tests. The associations between SC indicators and PA participation were analysed with multiple binomial logistic regression models. Self-rated health, obesity/overweight status and self-perceived SES were also entered as possible confounders in the analyses. Prior to analyses, linearity, multicollinearity, and independence of errors assumptions were checked for logistic regression (Field, 2009). None of these assumptions was violated. Odds ratios (OR) and 95% confidence intervals (CI) were calculated. Analyses were conducted using SPSS 21 software (Chicago, IL USA). The significance level was set at $p<0.05$.

RESULTS

Descriptive statistics of the SC variables, confounders and PA participation rates by gender are presented in Table 1. The Chi-square test indicated that female students demonstrated significantly lower student-interpersonal trust (41.4%) and neighbourhood trust (37.7%) when compared to male students (51.0%, 47.6%, respectively). In comparison with the females, male students reported significantly higher self-reported health (63.4%), obesity/overweight (28.5%), OPAP (77.7%), and MVPAP (48.6%). Finally, female students (72.9%) reported significantly higher self-perceived SES than males (63.4%).

Table 1. **COMPARISON OF PERCEPTION OF SOCIAL CAPITAL INDICATORS AND CONFOUNDERS BY GENDER IN TURKISH ADOLESCENTS**

Variable	**Total** (n=520)	**Females** (n=228)	**Males** (n=292)	**Chi-Square* p-value**
Family support in school				
High	389 (74.8%)	164 (71.9%)	225 (77.1%)	0.18
Low	131 (25.2%)	64 (28.1%)	67 (22.9%)	
Neighbourhood trust				
High	225 (43.3%)	86 (37.7%)	139 (47.6%)	0.02*
Low	295 (56.7%)	142 (62.3%)	153 (52.4%)	
Informal social control				
High	148 (28.5%)	66 (28.9%)	82 (28.2%)	0.85
Low	371 (71.5%)	162 (71.1%)	209 (71.8%)	
Teacher-student interper. trust				
High	249 (48.0%)	109 (48.0%)	140 (47.9%)	0.99
Low	271 (52.0%)	119 (52.0%)	152 (52.1%)	
Students interpersonal trust				
High	243 (46.8%)	94 (41.4%)	149 (51.0%)	0.03*
Low	277 (53.2%)	134 (58.6%)	143 (49.0%)	
Students' collaboration school				
High	321 (61.7%)	136 (59.6%)	185 (63.4%)	0.39
Low	199 (38.3%)	92 (40.4%)	107 (36.6%)	
Self-rated health				
Good	296 (56.9%)	111 (48.7%)	185 (63.4%)	0.01*
Poor	224 (43.1%)	117 (51.3%)	107 (36.6%)	
Body Mass Index				
Normal	443 (83.2%)	205 (89.9%)	238 (81.5%)	0.01*
Overweight/Obese	77 (14.8%)	23 (10.1%)	54 (28.5%)	
Self-Perceived SES				
High-Middle	351 (67.6%)	166 (72.9%)	185 (63.4%)	0.02*
Low	169 (32.4%)	62 (27.1%)	107 (36.6%)	
Overall PA Participation (ave. min/day)				
Active	340 (65.5%)	115 (50.2%)	227 (77.7%)	0.00*
Non-active	180 (34.5%)	113 (49.8%)	65 (22.3%)	
Moderate-to-Vigorous PA Participation (ave. min/day)				
Active	192 (36.9%)	50 (21.8%)	142 (48.6%)	0.00*
Non-active	328 (63.1%)	178 (78.2%)	150 (51.4%)	

*p<0.05 Chi-square analysis reflects comparison of the dichotomous scores by gender

Table 2. **ODDS RATIOS FOR OVERALL PHYSICAL ACTIVITY PARTICIPATION BY SOCIAL CAPITAL INDICATORS ADJUSTED FOR SELF-RATED HEALTH, SES AND BMI**

Variable	*OR (95% CI)* Total	Female	Male
Family support	1.21 (0.78-1.87)	2.53 (1.33-4.79)*****	0.50 (0.22-1.11)
Neighbourhood trust	1.34 (0.90-1.98)	1.46 (0.81-2.64)	1.30 (0.70-2.39)
Informal social control	1.00 (0.65-1.52)	1.55 (0.83-2.90)	0.54 (0.29-1.04)
Teacher-student interpersonal trust	0.79 (0.52-1.18)	1.31 (0.70-2.40)	0.58 (0.31-1.09)
Student interpersonal trust	0.85 (0.55-1.31)	0.49 (0.24-0.96)*****	0.97 (0.51-1.85)
Student collaboration in school	0.98 (0.65-1.48)	0.97 (0.53-1.80)	1.90 (0.58-2.06)
Self-rated health	1.73 (1.16-2.57)*	1.32 (0.73-2.40)	1.89 (1.01-3.53)*
Body Mass Index	1.10 (0.62-1.95)	0.51 (0.18-1.52)	1.21 (0.50-2.52)
Self-perceived SES	0.70 (0.46-1.07)	1.24 (0.65-2.36)	0.64 (0.33-1.22)

*p<0.05 SES=Socioeconomic Status

Table 3. **ODDS RATIOS FOR MODERATE-TO-VIGOROUS PHYSICAL ACTIVITY PARTICIPATION BY SOCIAL CAPITAL INDICATORS ADJUSTED FOR SELF-RATED HEALTH, SES AND BMI**

Variable	*OR (95% CI)* Overall	Female	Male
Family support	1.04 (0.66-1.61)	1.78 (0.80-3.95)	0.73 (0.40-1.33)
Neighbourhood trust	1.21 (0.83-1.78)	1.91 (0.93-3.90)	1.00 (0.61-1.65)
Informal social control	1.36 (0.90-2.05)	1.89 (0.92-3.87)	1.06 (0.61-1.82)
Teacher-student interpersonal trust	0.89 (0.59-1.34)	0.98 (0.46-2.01)	0.97 (0.58-1.65)
Student interpersonal trust	0.81 (0.53-1.24)	0.35 (0.14-0.84)*	0.94 (0.56-1.60)
Student collaboration in school	0.80 (0.53-1.19)	0.57 (0.27-1.17)	1.02 (0.60-1.71)
Self-rated health	1.96 (1.31-2.93)*	1.22 (0.60-2.50)	2.17 (1.28-3.68)*
Body Mass Index (BMI)	1.23 (0.70-2.13)	0.17 (0.02-1.41)	1.32 (0.68-2.54)
Self-perceived SES	0.70 (0.47-1.05)	0.84 (0.38-1.83)	0.80 (0.48-1.34)

*p<0.05 SES=Socioeconomic Status

The odds of OPAP for SC indicators adjusted for self-rated health, obesity/overweight status and self-perceived SES are shown in Table 2. Moreover, the model indicates that family support (OR=2.53, CI%=1.33-4.79) was significantly associated with OPAP, while student interpersonal trust (OR=0.49, CI%=0.24-0.96) was inversely associated with OPAP among female high-school students. Self-rated health was directly associated with OPAP for male high-school students (OR=1.89, CI%=1.01-3.53), and it was significantly associated with OPAP for the overall sample (OR=1.73, CI%=1.16-2.57) in the regression model.

Table 3 presents the results for the association between SC indicators and MVPAP. Students interpersonal trust (OR=0.35, CI%=0.14-0.84) was inversely associated with MVPAP for female adolescents in the regression model. Self-rated health was significantly associated with MVPAP for the overall sample (OR=1.96, CI%=1.31-2.93) and the male (OR=2.17, CI%=1.28-3.68) adolescents.

DISCUSSION

Although interest in SC in health studies is steadily on the increase, most of the previous studies were conducted in developed countries and adult populations to explicate the association between health-related behaviours and SC indicators. Because the cultural context in which SC exists is important to its maintenance and development, exploring the association between SC and health-related behaviours in developing and under developed countries may contribute to eliminating risk behaviours, such as physical inactivity in these cultures. This study reports the association between PA participation and various SC indicators controlled for self-rated health, obesity/overweight status and self-perceived SES in Turkish adolescents who live in a mid-sized urban city. The findings of this study provide new information related to PA behaviour and its interpersonal correlates within the context of developing countries.

Consistent with the gender patterns of PA findings in America (Trost *et al.*, 2002), Europe (Riddoch *et al.*, 2004), the Balkans (Novak *et al.*, 2015) and the far east (Wu *et al.*, 2003), males reported significantly higher PA participation. Males also reported significantly higher obesity/overweight status, self-rated health, neighbourhood trust and student interpersonal trust than females. Females reported significantly higher self-perceived SES than males. Although perceived family support was not statistically different between the genders, only females with higher family support reported higher OPAP. Furthermore, females with higher student interpersonal trust reported 51% lower odds for OPAP and 65% lower odds for MVPAP than females with low interpersonal trust.

Although the males reported a higher percentage of family SC (77.1%) compared to the females (71.9%), the current results indicated that family SC was associated with PA participation only for the females. This finding could be associated with the better family relationship of Turkish female adolescents. Similar to this finding, Arslan (2018) indicated that family social support is a significant factor in psychosocial wellbeing for only Turkish female adolescents. A higher sense of family belonging is associated with positive health-related behaviours, such as sufficient fruit and vegetable consumption and PA participation among English adolescents (Morgan & Haglund, 2009).

Wu *et al.* (2003) indicated that Taiwanese female adolescents reported more positive social support, norms and modelling from parents to be more active compared to male adolescents. Gustafson and Rhodes (2006) indicated that parental role modelling in establishing well-formed social norms regarding PA, is important for promoting positive PA behaviour. Moreover, social support provided by parents is an influential factor on PA behaviour mediated by motivation

(McDavid *et al.*, 2012). To illustrate, adolescents who received high support from at least one of the parents were reported as more likely to be physically active in New Zealand (Hohepa *et al.*, 2007). On the other hand, Novak *et al.* (2016) demonstrated that family SC is solely associated with MVPAP among Croatian male adolescents. They ascribed this result to the Croatian family structure, which highlighted the finding of higher social loneliness among adolescents and lower parental quality compared to other Balkan countries. Perceiving higher support from the family could be attributed to the higher PA participation, due to the instrumental, conditional, motivational, and informational support in PA context provided by the family members, which is directly or indirectly associated with PA among adolescents (Beets *et al.*, 2010).

The findings of this study revealed an inverse association between interpersonal trust among students and both OPAP and MVPAP among female adolescents. This finding is consistent with a previous study examining interpersonal trust among Turkish female adolescents living in urban and rural areas (Yıldızer *et al.*, 2018). These inverse associations could be attributed to the linkage between social trust and support for PA participation. Lindström *et al.* (2001) suggested that low levels of PA may be due to a lack of generalised trust of other people in social networks. To illustrate, low trust is associated with higher odds for low PA among Swedish adults, who needed support to participate in PA (Lindström, 2011).

It is also worthwhile to note that trust encourages people to act together to attain mutual goals (Kreuter & Lezin, 2002). However, 58.6% of the female adolescents reported low trust among students. Another explanation for the inverse association between student interpersonal trust and PA participation for female adolescents could be the PA choices of Turkish female adolescents and the opportunities that the school provides for supporting PA participation. Male adolescents prefer to participate in competitive activities, while female adolescents prefer activities related to exercises, such as aerobics and yoga or swimming which are not provided in the schools where this study was conducted (Wilson *et al.*, 2005). However, preferred activities of female adolescents are not offered by the physical education curriculum and public schools lack sufficient resources to support these PA preferences in Turkish context. Therefore, inverse association between student interpersonal trust and PA behaviour might be caused by the activities and opportunities provided by the high school.

On the other hand, males have the opportunity to participate in competitive team sports, such as football and basketball where they can demonstrate their skills and, in turn, might affect the perceived interpersonal trust with respect to PA. In other words, female adolescents with high student interpersonal trust might not have sufficient opportunities and resources to transfer their peer support to PA behaviour. In line with this explanation, Arslan (2018) reported that perceived school and peer supports were greater among females in order to cope with social exclusion in the Turkish high school setting. However, the lack of preferred PA opportunities might mitigate to PA participation in the school setting for Turkish female adolescents.

The inverse relationship between SC and PA participation among Turkish female adolescents could also be explained by the dark side of the SC. SC is acknowledged to be a double-edged phenomenon that may affect health-related behaviour negatively (Villalonga-Olives & Kawachi, 2017). Thus, too strong SC could be associated with negative health consequences produced by the strict maintenance of social order (Kawachi *et al.*, 2008).

The results of the current study indicates that there are significant differences in SC perception between genders where one of those perceptions are associated with PA, only for Turkish female adolescents. Westermann *et al.* (2005) found that many aspects of SC, such as collaboration, conflict resolution, norms of reciprocity, which are more likely to operate in a

female group. The different gender roles and socialising patterns, specific to culture, could be associated with these results (Ferlander & Mäkinen, 2009). Moreover, Garcia *et al.* (1998) found gender differences in the PA beliefs on the transition from elementary to high school, and these beliefs include the decline in social support for PA among female adolescents. Thus, perceived social support is very important factor for increasing PA participation among female adolescents. The results of this study indicated that perceived family support is an important factor for Turkish female adolescents to be physically active.

Self-rated health was the most consistently associated variable with PA participation for the overall sample and male adolescents, while it was not associated with any form of PA participation for female students. To illustrate, self-rated health is associated with hours of PA regardless of the actual health status among adults (McHugh & Lawlor, 2013). Moreover, previous studies demonstrated that physically active adolescents reported higher mental (Herman *et al.*, 2015) and general health (Kantomaa *et al.*, 2015). Abu-Omar *et al.* (2004) demonstrated a positive relationship between PA and self-rated health for European subgroups divided by income, educational attainment, gender and age. Thus, the association between PA participation and self-rated health among the overall population and males could be attributed to the prevalence of PA participation among male adolescents.

CONCLUSION

In conclusion, this study presents the association between various SC indicators and PA participation among Turkish adolescents in a mid-sized urban city. The results indicated that family SC perception was positively associated with OPAP, while interpersonal trust of the high-school students was inversely associated with both OPAP and MVPAP among Turkish female adolescents. None of the SC indicators was associated with PA participation among Turkish male adolescents.

RECOMMENDATIONS

Parents and siblings, teachers, friends in school and the neighbourhood are important providers of SC. Gaertner *et al.* (2010) indicated that youths obtain different types, or aspects of social support from various relationships and one relationship might become increasingly important for an adolescent, while another is lacking any social support. Therefore, conducting further longitudinal research on how adolescents perceive SC and transfer this provision into health behaviour is also important.

Finally, social support can be financial, logistic and emotional and people might experience benefits related to health outcomes, such as PA participation in the supportive social environment. Additional studies are needed to identify intervention programmes to improve the norms, sense of trust to promote positive SC perception among adolescents that might result in higher PA participation among adolescents. It is necessary to elucidate cultural differences related to SC, as the association between SC indicators and the various health outcomes dependant on different cultural norms (Binbay *et al.*, 2012).

While results of the study indicate significant associations between SC and PA participation, this study has some methodological limitations. The cross-sectional design might be caused by the reverse causation. Although the PA assessment with self-administered instruments is feasible, these instruments produce data with validity and reliability that varies in different populations. A sample size of this study is considerably small, and the sample

represents only one city in the Turkish context. Future studies should consider these methodological limitations.

Acknowledgments

This study was supported by the Eskişehir Technical University BAP grants BAP/1607S577, and this study is pilot research of a Ph.D. dissertation. The authors would like to thank all high school students who participated in this study and their families.

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(*Subject editor: Prof. Maya van Gent*)