

University of Groningen

## Socio-economic differences in self-esteem of adolescents influenced by personality, mental health and social support

Veselska, Zuzana; Geckova, Andrea Madarasova; Gajdosova, Beata; Orosova, Olga; van Dijk, Jitse P.; Reijneveld, Sijmen A.

*Published in:*  
European Journal of Public Health

*DOI:*  
[10.1093/eurpub/ckp210](https://doi.org/10.1093/eurpub/ckp210)

**IMPORTANT NOTE: You are advised to consult the publisher's version (publisher's PDF) if you wish to cite from it. Please check the document version below.**

*Document Version*  
Publisher's PDF, also known as Version of record

*Publication date:*  
2010

[Link to publication in University of Groningen/UMCG research database](#)

### *Citation for published version (APA):*

Veselska, Z., Geckova, A. M., Gajdosova, B., Orosova, O., van Dijk, J. P., & Reijneveld, S. A. (2010). Socio-economic differences in self-esteem of adolescents influenced by personality, mental health and social support. *European Journal of Public Health, 20*(6), 647-652. <https://doi.org/10.1093/eurpub/ckp210>

### **Copyright**

Other than for strictly personal use, it is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), unless the work is under an open content license (like Creative Commons).

The publication may also be distributed here under the terms of Article 25fa of the Dutch Copyright Act, indicated by the "Taverne" license. More information can be found on the University of Groningen website: <https://www.rug.nl/library/open-access/self-archiving-pure/taverne-amendment>.

### **Take-down policy**

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

Downloaded from the University of Groningen/UMCG research database (Pure): <http://www.rug.nl/research/portal>. For technical reasons the number of authors shown on this cover page is limited to 10 maximum.

# Socio-economic differences in self-esteem of adolescents influenced by personality, mental health and social support

Zuzana Veselska<sup>1,2</sup>, Andrea Madarasova Geckova<sup>1,2</sup>, Beata Gajdosova<sup>3</sup>,  
Olga Orosova<sup>3</sup>, Jitse P. van Dijk<sup>1,4</sup>, Sijmen A. Reijneveld<sup>4</sup>

**Background:** Previous studies indicate that self-esteem is lower among adolescents of low socio-economic status and is associated with a number of intrapersonal, interpersonal and socio-cultural factors. Evidence on the mechanisms by which these factors contribute to the connection between socio-economic status and developing self-esteem is incomplete, however. The purpose of this cross-sectional study is to assess whether personality, mental health and social support contribute to the relationship between socio-economic status and self-esteem. **Methods:** A sample of 3694 elementary-school students from Slovakia (mean age = 14.3 years, 49% boys) filled out the Rosenberg Self-esteem Scale, the Family Affluence Scale, the Ten-Item Personality Inventory, the 12-item General Health Questionnaire and the Perceived Social Support Scale. **Results:** Hierarchical linear regression showed family affluence, personality dimensions of extroversion, emotional stability and openness to experience, as well as mental health subscales and social support from family and significant others to be associated with self-esteem. Results indicate that personality dimensions and mental health subscales contribute to the association between family affluence and self-esteem. **Conclusion:** The contribution of personality and mental problems in the relation between socio-economic status and self-esteem may have important implications for the design of promotional programs aimed at enhancing self-esteem.

**Keywords:** adolescence, mental health, personality, self-esteem, socio-economic status

## Introduction

Socio-economic position has a clear impact on developing self-esteem, especially during the important stage of adolescence. At this period of life, the self-esteem of young people undergoes important changes, influenced not only by the already-mentioned socio-economic status, but also by variety of other intrapersonal, interpersonal and socio-cultural determinants.<sup>1</sup> Adolescence, the period of transition from childhood to adulthood, is a critical time for the development of lifelong perceptions, beliefs, values and practices. An adolescent struggle with the developmental tasks of establishing an identity, accepting changes in physical characteristics, learning skills for a healthy lifestyle and separating from family.<sup>2</sup> Therefore, before entering adulthood, it is important for the adolescent to develop high self-esteem and the ability to care for the self.<sup>3</sup>

Self-esteem has well-known consequences not only on current physical and mental health and health-related behaviour, but also on future health and health-related behaviour during adulthood.<sup>4</sup> Self-esteem also plays an important role in what are currently the most frequently used cognitive models of health behaviour, such as the Theory of Planned Behavior (TPB),<sup>5</sup> the Attitude-Social

influence-self-Efficacy (ASE) model,<sup>6</sup> the Theory of Triadic Influence (TTI)<sup>7</sup> and the Precede-Proceed model.<sup>8</sup> Based on the review by Mann *et al.*,<sup>4</sup> self-efficacy in behavioural domains, according to the TPB, influences self-esteem or the evaluation of self-worth. At the same time, according to other models such as the ASE or TTI, self-esteem could be considered as a distal factor influencing self-efficacy in specific behavioural domains. In addition, to be able to change the consequences of self-esteem on future health and health-related behaviour, it is important to be aware of possible correlates and associations of low or high self-esteem which are crucial during the developmental stage of adolescence. According to Harter<sup>3</sup>, the development and maintenance of self-esteem in childhood and adolescence is influenced by two important factors: perceived competence in areas of importance and the experience of social support. Considering other factors, correlates of self-esteem can be divided into several essential domains: (i) gender, (ii) socio-economic factors, (iii) personality factors and mental health; and (iv) factors from family, friends and significant others. It is also necessary to mention that in the past, researchers only investigated levels of explicit self-esteem. However, in recent decades other aspects of self-esteem have been discovered and explored, such as implicit self-esteem, contingent self-esteem and self-esteem stability.<sup>10,11</sup>

Gender has been reported to have an influence on developing self-esteem during adolescence. Boys are more likely to have high self-esteem at this stage of life than girls.<sup>12–14</sup> Gender differences have also been reported in age-related changes. Self-esteem among boys tends to increase, while self-esteem among girls tends to decrease a little during early adolescence.<sup>15,13</sup>

Previous studies also show socio-economic status to be significantly related to self-esteem. In general, those with higher socio-economic status report higher self-esteem than those with lower socio-economic status.<sup>16,17</sup> Among

1 Kosice Institute for Society and Health, PJ Safarik University, Kosice, Slovak Republic

2 Institute of Public Health, Medical Faculty, PJ Safarik University, Kosice, Slovakia

3 Department of Educational Psychology and Health Psychology, Faculty of Arts, PJ Safarik University, Kosice, Slovak Republic

4 Department of Social Medicine, University Medical Center Groningen, University of Groningen, The Netherlands

**Correspondence:** Zuzana Veselska, Institute of Public Health, Medical Faculty, PJ Safarik University, Tr. SNP 1, 040 66 Kosice, Slovakia, tel: +421 55 234 33 93, e-mail: zuzana.veselska@upjs.sk

socio-economic factors, family income seems to be most related to self-esteem among adolescents.<sup>15</sup>

Mental health has been reported to be associated with self-esteem in the past. Several studies<sup>18–21</sup> have been conducted in this field, and associations have been found between self-esteem and depression and between self-esteem and anxiety. Self-esteem has been also reported to be related to eating disorders<sup>22</sup> and aggression.<sup>23,24</sup> However, the relationship between self-esteem and aggression is currently being debated by researchers. Some authors argue that low self-esteem is related to aggression,<sup>23</sup> whereas others indicate that high self-esteem is linked to aggression.<sup>24</sup> Surprisingly, less attention has been paid to the connection between personality dimensions and self-esteem itself, though it could be hypothesized that consistent personality traits might influence the way people perceive and evaluate themselves.<sup>25</sup>

Family, peers and significant others play a major role in the development of an adolescent's self-esteem. The family in particular, as the primary environment at this period of life, provides an important background for developing and creating the initial sense of oneself. Previous studies have found a positive relationship between supporting family relationships and self-esteem.<sup>15,26,27</sup> On the other hand, a lack of support or a dysfunctional family environment has been described as a contributor to maladjustment, behavioural problems and drug abuse.<sup>28,29</sup> In addition, support from peer groups and significant others, like teachers, could positively or negatively influence the development of one's self-esteem. The question remains regarding how social support from family, friends and significant others contribute along with other self-esteem factors (e.g. personality, mental health) to the association between socio-economic status and self-esteem.

Factors such as gender, socio-economic status, personality and mental health and support from family and other relationships are all suggested as important influences in the field of the developing self-esteem during the adolescence, ultimately affecting outcomes in the area of mental health and health behaviour. Understanding the associations between self-esteem and its correlates could bring new ideas to the role of self-esteem in the framework of health promotion among young people. Socio-economic status is less strongly associated with self-esteem in comparison to personality dimensions and mental health constructs, which are very similar and strongly associated. Social support from family, friends and significant others could be seen again as conceptually more distinct in relation to self-esteem.

Therefore, based on the theoretical and empirical findings, the main aim of this study is to assess whether personality, mental health and social support contribute to the relationship between socio-economic status and self-esteem. We will explore these variables and their associations with self-esteem. We assume that (i) socio-economic status, personality, mental health and social support will be significantly associated with self-esteem; (ii) socio-economic status will be less strongly related to self-esteem in the model, and the explanatory power will decrease after adding personality dimensions, mental health and social support subscales; and (iii) personality dimensions and mental health subscales, as similar constructs, will be strongly related to self-esteem and have a greater explanatory power.

## Methods

### *Sample and procedure*

The study sample consisted of 3725 adolescents in the eighth and ninth grades of elementary schools in the major cities of Bratislava (approximately 425 000 inhabitants, Western

Slovakia), Zilina (approximately 157 000 inhabitants, Northern Slovakia), Kosice (approximately 240 000 inhabitants, Eastern Slovakia) and other smaller cities (approximately 20 000–40 000 inhabitants) in the eastern region of Slovakia, representing different parts of the country. The study sample was fairly evenly divided by gender (49% boys, 51% girls) and ranged in age from 11 to 17 years (mean age = 14.3 years, SD = 0.65). We decided to exclude students under 13 and over 16 years of age to make the sample more homogeneous and to avoid the influence of age extremes. After this step, the study sample consisted of 3694 students (mean age = 14.3 years, SD = 0.62). Of the sample, 24.6% came from Bratislava, 21.3% from Zilina, 32.1% from Kosice and 22% from other eastern region cities.

Trained researchers and research assistants collected the data between October and December 2006. The set of questionnaires was administered during two regular 45-min lessons in a complete 90-min period of time on a voluntary and anonymous basis in the absence of teachers. An overall response rate of 93.5% was achieved. Non-response was due to illness or other types of school absence. The local Ethics Committee approved the study.

### *Measures*

Self-esteem was assessed with the Rosenberg Self-Esteem Scale (RSES).<sup>30</sup> The 10 items of the RSES assess a person's overall evaluation of his/her worthiness as a human being.<sup>31</sup> Responses range on a 4-point scale from 1 (strongly disagree) to 4 (strongly agree). Global self-esteem factor can then be calculated, with the sum score ranging from 10 to 40. A higher score indicates higher self-esteem. Cronbach's alpha for global self-esteem was 0.76.

Socio-economic status was measured by the Family Affluence Scale (FAS), which was developed for the Health Behaviour in School-aged Children (HBSC) surveys<sup>32</sup> as a measure of family wealth. It comprises four items about family car ownership, bedroom occupancy, computer ownership and family holidays. The composite FAS score (ranging from 0 to 7) was calculated, with a higher score indicating higher family affluence. Cronbach's alpha was 0.60.

Personality was measured using the Ten-Item Personality Inventory (TIPI), which is a very brief measure of the Big-Five personality domains, with only 10 items being assessed. Each item consists of two descriptors, separated by a comma, using the common stem 'I see myself as:' (e.g. 'I see myself as: extroverted, enthusiastic'). Five dimensions were calculated within this scale, with the higher score indicating a higher level of each dimension: extroversion (2 items), agreeableness (2 items), emotional stability (2 items), conscientiousness (2 items) and openness to experience (2 items). Responses range on a 7-point scale from 1 (strongly disagree) to 7 (strongly agree), with the sum score ranging from 2 to 14 for each subscale.<sup>33</sup> Correlations between subscales were significant and are presented in table 2. The strongest correlations are between extroversion and openness to experience (0.31) and between emotional stability and agreeableness (0.27).

Psychological well-being was measured using the 12-item General Health Questionnaire (GHQ-12), with a higher score indicating worse psychological well-being.<sup>34</sup> With this scale, 2 factors could be computed: depression/anxiety (6 items) and social dysfunction (6 items). Responses range on a 4-point scale from 1 to 4, with the sum score ranging from 6 to 24 for each factor.<sup>35</sup> Cronbach's alpha was 0.82 for the depression/anxiety subscale and 0.65 for social dysfunction. Correlation between the subscales is 0.53 (table 2).

Support from family, friends and significant others was measured using the Perceived Social Support Scale (PSSS),

with a higher score indicating higher social support. With this scale, consisting of 12 items, 3 possible subscales could be calculated: perceived support from family (4 items), perceived support from friends (4 items) and perceived support from significant others (4 items), with the sum score ranging from 4 to 28 for each subscale. Responses range on a 7-point scale from 1 (strongly disagree) to 7 (strongly agree).<sup>36–38</sup> Cronbach's alphas for the perceived support from family, friends and significant others subscales were 0.91, 0.91 and 0.85, respectively. Correlations between the subscales are rather strong (0.59, 0.67, 0.78) and are presented in table 2.

### Statistical procedure and analysis

Standard descriptive analyses (mean, standard deviation and range of sum score) were performed in the first step. All the scales used in this study were also checked for their distributional properties, and normal distributions were found. Next, we explored the correlations between all the variables. Finally, linear regression was used to analyze the data and to explore associations between self-esteem and other variables, with self-esteem as the dependent variable, adjusted for gender. We did this in both a bivariate and multivariate way. In the multiple regression the variables were entered hierarchically in the following order: Model 0 gender; Model 1 family affluence; in Model 2 the TIPI subscales were added; in Model 3 the GHQ-12 subscales were added and in Model 4 the PSSS subscales were added. The present study focused on the association between socio-economic status and self-esteem and on the other factors (e.g. personality, mental health, social support) contributing to this association. Therefore family affluence as an indicator of socio-economic status was added in Model 1. Variables were then added in an order from the proximal to the distal factors in three additional steps (Model 2 to 4): that is, starting with personality as the most proximal factor, via mental health, to social support as the most distal factor. We also explored in an additional analysis whether the associations of personality, mental health with global self-esteem were moderated by socio-economic status, as measured by family affluence. All analyses were performed using SPSS version 12.

## Results

Tables 1 and 2 show the descriptive statistics (mean, standard deviation and range of sum score) and correlation matrix for the variables.

In the next step the regression analyses of the associations of the study variables with global self-esteem and the crude effect

of all the variables was performed. All of the variables are associated significantly with global self-esteem, but separately they explain just a small part of the total variance. Higher family affluence, a higher level of extroversion, agreeableness, conscientiousness, emotional stability and openness to experience as well as a higher amount of perceived support from family, friends and significant others are all associated with higher global self-esteem. On the contrary, higher levels of depression/anxiety and social dysfunction are associated with lower global self-esteem. Among the study variables, both GHQ-12 subscales have the highest standardized  $\beta$  coefficients and the highest explained variance. Other variables, with the small exceptions of emotional stability and perceived support from family subscales, stay at the approximately same level of explained variance.

Table 3 shows the results of hierarchical regression analysis for global self-esteem, adjusted for gender, with 4 models. Altogether, the study variables accounted for 40% of the total variance and from Model 1 to Model 4 the explained variance increased from 6 to 40%. Model 1 contains family affluence, representing socio-economic status with a rather low explained variance of 6%. The standardized  $\beta$  coefficient for family income decreased in subsequent models, which may, along with the variables added, be mediators in a causal chain. Similarly, the explained variance increased both after adding personality dimensions and after the additional inclusion of depression/anxiety and social dysfunction. Adding social support (Model 4) hardly affected other betas and explained the variance.

**Table 1** Descriptive statistic of the study variables

	Mean (SD)	Range
<b>Self-esteem</b>		
Global self-esteem	28.07 (4.45)	10–40
Family affluence	3.91 (1.66)	0–7
<b>TIPI</b>		
Extroversion	9.34 (2.85)	2–14
Agreeableness	9.21 (2.42)	2–14
Conscientiousness	9.49 (2.51)	2–14
Emotional stability	8.77 (2.68)	2–14
Openness to experience	9.83 (2.62)	2–14
<b>GHQ-12</b>		
Depression/anxiety	11.80 (4.30)	6–24
Social dysfunction	11.72 (2.61)	6–24
<b>PSSS</b>		
Support from family	21.70 (5.48)	4–28
Support from friends	21.65 (5.44)	4–28
Support from others	22.07 (5.29)	4–28

**Table 2** Correlation matrix of the study variables

	1	2	3	4	5	6	7	8	9	10	11	12
1 Global self-esteem	1											
2 Family affluence	0.16**	1										
3 TIPI extroversion	0.18**	0.11**	1									
4 TIPI agreeableness	0.11**	–0.00	–0.03*	1								
5 TIPI conscientiousness	0.07**	–0.01	0.06**	0.13**	1							
6 TIPI emotional stability	0.28**	0.08**	0.12**	0.27**	0.04*	1						
7 TIPI openness to experience	0.18**	0.11**	0.31**	0.15**	0.17**	0.12**	1					
8 GHQ depression anxiety	–0.55**	–0.07**	–0.06**	–0.08**	–0.00	–0.29**	–0.02	1				
9 GHQ social dysfunction	–0.39**	–0.09**	–0.08**	–0.09**	–0.04**	–0.19**	–0.09**	0.53**	1			
10 PSSS support from family	0.26**	0.05**	0.13**	0.11**	0.10**	0.13**	0.12**	–0.19**	–0.18**	1		
11 PSSS support from friends	0.13**	0.04*	0.22**	0.11**	0.07**	0.09**	0.20**	–0.04*	–0.10**	0.59**	1	
12 PSSS support from others	0.15**	0.05**	0.21**	0.12**	0.09**	0.07**	0.22**	–0.02	–0.09**	0.67**	0.78**	1

\*Correlation is significant at the 0.05 level (two-tailed)

\*\*Correlation is significant at the 0.01 level (two-tailed)



**Table 3** Associations of SES, personality dimensions, mental health and perceived social support with global self-esteem: standardized beta coefficients from hierarchical linear regression

	Model 1	Model 2	Model 3	Model 4
Gender <sup>a</sup>	-0.19***	-0.22***	-0.10***	-0.12***
Family affluence	0.14***	0.09***	0.07***	0.07***
TIPI extroversion		0.15***	0.11***	0.10***
TIPI agreeableness		0.05**	0.03	0.02
TIPI conscientiousness		0.05**	0.05**	0.04**
TIPI emotional stability		0.22***	0.09***	0.09***
TIPI openness to experience		0.10***	0.10***	0.08***
GHQ-12 depression/anxiety			-0.44***	-0.43***
GHQ-12 social dysfunction			-0.09***	-0.07***
PSSS support from family				0.08***
PSSS support from friends				0.01
PSSS support from others				0.07*
R-square	0.06***	0.18***	0.38***	0.40***

<sup>a</sup>: 1 = female

Model 1 = gender, family affluence

Model 2 = gender, family affluence, TIPI subscales

Model 3 = gender, family affluence, TIPI subscales, GHQ-12 subscales

Model 4 = gender, family affluence, TIPI subscales, GHQ-12 subscales, PSSS subscales

\* $P < 0.05$ , \*\* $P < 0.01$ , \*\*\* $P < 0.001$

We also explored in an additional analysis whether the associations of personality and mental health with global self-esteem were moderated by socio-economic status, as measured by family affluence. No moderating effect of socio-economic status was found on the association between personality and self-esteem or mental health and self-esteem.

## Discussion

Self-esteem is an influential factor in both physical and mental health.<sup>4</sup> Our findings reveal that an association exists between low socio-economic status and lower self-esteem. This association changed after adjustment for personality and mental health, but not after additional adjustment for social support.

Family affluence as an indicator for socio-economic status remained significantly associated with self-esteem from the first to the final model, but its explanatory power decreased after adding personality dimensions and mental health variables (depression/anxiety and social dysfunction). At the same time, family affluence itself explained only 6% of the variance in self-esteem. This indicates the existence of other influential factors contributing to the association between socio-economic status and self-esteem and could be explained by the mediating role of the personality dimension of emotional stability and even more so by the mental health subscale of depression and anxiety. Also, previous studies on the mediating processes between socio-economic status, personality and self-esteem and socio-economic status, family processes and self-esteem indicate such a possibility.<sup>25,39,40,41</sup> Our findings imply that lower socio-economic status is an indicator of lower feelings of self-worth among adolescents, but at the same time such a connection is mediated by young people's personality and mental health.

Depression and anxiety as mental health factors explained the greatest part of the total variance, and in the model this variable took its explanatory power from family affluence, as has been already mentioned. After adding in this factor, the

explanatory power of the personality dimension emotional stability decreased rapidly as well. This may be due to the fact that both of them, emotional stability as well as depression and anxiety, are of a rather similar construct. Their connection has been revealed by previous studies. Neuroticism has been shown to be associated with depression or anxiety.<sup>42</sup> Moreover, depression and anxiety are frequently associated with self-esteem.<sup>20</sup> With social support, we moved from the internal to the external determinants of self-esteem. During adolescence, young people have to struggle with developing their self-identity. Family members are those who could primarily influence the perception of self-worth, providing positive feedback and appraisal of an adolescent's behaviour, and consequently influence also relationships outside the family environment, which again shape the feelings of self-worth.<sup>43</sup> As can be seen, social support did not remarkably change the relationship between socio-economic status and adolescent self-esteem.

## Strengths and limitations

This study has several important strengths, the most important being its large nationally representative sample and its high response rates. It also has limitations. First, only subjective self-reports were used for measuring individual aspects. However, previous studies support the validity of such self-reports.<sup>44</sup> A second limitation is the cross-sectional design of our study, which makes conclusive statements about causality in our findings impossible. They thus need to be confirmed in a longitudinal design. However, as is discussed in Mann *et al.*<sup>4</sup> and Flay, Allred and Ordway,<sup>45</sup> there is a lack of clarity regarding the direction of the causal relations between self-esteem and mental problems and disorders (e.g. depression, anxiety or social dysfunction measured in the present study). Finally, it needs to be mentioned that other aspects of self-esteem (e.g. implicit self-esteem, contingent self-esteem) were not measured.

## Implications and conclusion

The contribution of personality and mental problems on the relation between socio-economic status and self-esteem may have important implications for the design of health-promotion programs aimed at the reduction of socio-economic differences in adverse health behaviour. Family affluence is clearly associated with adolescent self-esteem and has an impact on the way young people evaluate themselves. Adolescents of low socio-economic status seem to be a more vulnerable group in the comparison to their peers of higher socio-economic status and were identified as a target group for health-promotion programs. The review of Haney and Durlak<sup>46</sup> about self-esteem interventions provides evidence for the effectiveness of these interventions. However, the authors indicate that such interventions, even though potentially effective, need a better theoretical foundation and should take into account possible differences between participants (e.g. age, ethnicity or type of their problems). Longitudinal studies are needed, however, to support the causal chain we have inferred from our cross-sectional study.

## Funding

Slovak Research and Development Agency under contract no APVV-20-038205 and by the Science and Technology Assistance Agency under contract no APVT-20-028802.

Conflicts of interest: None declared.

## Key points

- Socio-economic status has a clear impact on developing self-esteem especially during the important stage of adolescence. To be able to intervene effectively on self-esteem, evidence is needed on other factors that lead from socio-economic position to self-esteem during this developmental stage.
- Adolescents of low socio-economic status seem to be more vulnerable in comparison with their peers of higher socio-economic status and were identified as a target group for health-promotion programs.
- Our findings indicate a contribution of personality and mental problems to the relationship between socio-economic status and self-esteem, which may provide cues for the design of health promotion programs aimed at the reduction of socio-economic differences in adverse health behaviours of young adolescents.

## References

- Finkenauer C, Engels RCME, Meeus WS, et al.. Self and identity in early adolescence. The pains and gains of knowing who and what you are. In: Brinthaupt TM, Lipka RP, editors. *Understanding early adolescent self and identity. Applications and interventions*. Albany, NY: State University of New York Press, 2002, 25–56.
- Susman EJ, Dorn LD, Schiefelbein VL. Puberty, sexuality, and health. In: Lerner RM, Easterbrooks MA, Mistry J, editors. *Handbook of psychology, Vol. 6, Developmental psychology*. New Jersey: John Wiley & Sons, 2003, 301–9.
- Anderson JA, Olnhausen KS. Adolescent self-esteem: a foundational disposition. *Nurs Sci Q* 1999;12:62–7.
- Mann M, Hosman CM, Schaalma HP, et al.. Self-esteem in a broad-spectrum approach for mental health promotion. *Health Educ Res* 2004;19:357–72.
- Ajzen I. The theory of planned behavior. *Organ Behav Hum Decis Process* 1991;50:179–211.
- De Vries H, Mudde AN. Predicting stage transitions for smoking cessation applying the Attitude–Social influence–Efficacy Model. *Psychol Health* 1998;13:369–85.
- Flay BR, Petraitis J. The theory of triadic influence: a new theory of health behavior with implications for preventive interventions. *Adv Med Social* 1994;4:19–44.
- Green LW, Kreuter MW. *Health promotion planning: an educational and ecological approach*. Mountain View, CA: Mogfield, 1999.
- Harter S. *The construction of the self. A developmental perspective*. NY: Guilford Press, 1999.
- Crocker J, Luhtanen RK, Cooper ML, et al.. Contingencies of self-worth in college students: theory and measurement. *J Pers Soc Psychol* 2003;85:894–908.
- Kernis MH, Cornell DP, Chien-Ru S, et al.. There's more to self-esteem than whether it is high or low: the importance of stability of self-esteem. *J Pers Soc Psychol* 1993;65:1190–204.
- McMullin JA, Cairney J. Self-esteem and intersection of age, class, and gender. *J Aging Stud* 2004;18:75–90.
- Robins RW, Trzesniewski K, Tracy JL, et al.. Global self-esteem across the life span. *Psychol Aging* 2002;17:423–34.
- Kling KC, Hyde JS, Showers CJ, et al.. Gender differences in self-esteem: a meta analysis. *Psychol Bull* 1999;125:470–500.
- Birndorf S, Ryan S, Auinger P, et al.. High self-esteem among adolescents: longitudinal trends, sex differences, and protective factors. *J Adolesc Health* 2005;37:194–201.
- Rhodes J, Roffman J, Reddy R, et al.. Changes in self-esteem during the middle school years: a latent growth curve study of individual and contextual influences. *J Sch Psychol* 2004;42:243–61.
- Francis LJ, Jones SH. Social class and self-esteem. *J Soc Psychol* 1996;136:405–6.
- Miyamoto RH, Hishinuma ES, Nishimura ST, et al.. Path models linking correlates of self-esteem in multi-ethnic adolescent sample. *Pers Individ Dif* 2001;31:701–12.
- Bolognini M, Plancherel B, Bettschart W, et al.. Self-esteem and mental health in early adolescence: development and gender differences. *J Adolesc* 1996;19:233–45.
- Rosenberg M, Schooler C, Schoenbach C, et al.. Global self-esteem and specific self-esteem: different concepts, different outcomes. *Am Sociol Rev* 1995;60:141–56.
- Brown JD, Mankowski TA. Self-esteem, mood, and self-evaluation: changes in mood and the way you see you. *J Pers Soc Psychol* 1993;64:421–43.
- Stice E, Presnell K, Spangler D. Risk factors for binge eating onset in adolescent girls: a 2-year prospective investigation. *Health Psychol* 2002;21:131–8.
- Donnellan MB, Trzesniewski KH, Robins RW, et al.. Low self-esteem is related to aggression, antisocial behavior, and delinquency. *Psychol Scien* 2005;16:328–35.
- Baumeister RF, Smart L, Boden JM. Relation of threatened egotism to violence and aggression: the dark side of high self-esteem. *Psychol Rev* 1996;103:5–33.
- Robins RW, Tracy JL, Trzesniewski K, et al.. Personality correlates of self-esteem. *J Res Pers* 2001;35:463–82.
- Sweeting H, West P. Family life and health in adolescence: a role for culture in the health inequalities debate? *Soc Sci Med* 1995;40:163–75.
- Barrera M, Garrison-Jones C. Family and peer social support as specific correlates of adolescent depressive symptoms. *J Abnorm Child Psychol* 1992;20:1–16.
- Wentzel KR. Family functioning and academic achievement in middle school: a social-emotional perspective. *J Early Adolesc* 1994;14:268–91.
- McKay JR, Murphy RT, Rivinus TR, et al.. Family dysfunction and alcohol and drug use in adolescent psychiatric inpatients. *J Am Acad Child Adolesc Psychiatry* 1991;30:967–72.
- Rosenberg M. *Society and adolescent self-image*. Princeton, NJ: Princeton University Press, 1965.
- Rosenberg M. *Conceiving the self*. New York: Basic Books, 1979.
- Currie C, Roberts C, Morgan A, et al., editors. *Young people's health in context. Health Behaviour in School-aged Children (HBSC) study: international report from the 2001/2002 survey*. Health Policy for Children and Adolescents. Copenhagen: WHO Regional Office for Europe, 2004.
- Gosling SD, Rentfrow PJ, Swann WB Jr. A very brief measure of the big-five personality domains. *J Res Pers* 2003;37:504–28.
- Goldberg D. The General Health Questionnaire. In: McDowell I, Newell C, editors. *Measuring health*. New York: Oxford University Press, 1972, 139–45.
- Sarkova M, Nagyova I, Katreniakova Z, et al.. Psychometric evaluation of the general health questionnaire-12 and Rosenberg self-esteem scale in Hungariona and Slovak early adolescents. *Stud Psychol (Bratisl)* 2006;48:69–79.
- Blumenthal JA, Burg MM, Barefoot J, et al.. Social support, type A behavior, and coronary artery disease. *Psychosom Med* 1987;49:331–40.
- Zimet GD, Dahlem NW, Zimet SG, et al.. The multidimensional scale of perceived social support. *J Pers Assess* 1988;52:30–41.
- Dahlem NW, Zimet GD, Walker RR. The multidimensional scale of perceived social support: a confirmation study. *J Clin Psychol* 1991;47:756–61.
- Ruiz SY, Roosa MW, Gonzales NA. Predictors of self-esteem for Mexican American and European American youths: a reexamination of the influence of parenting. *J Fam Psychol* 2002;16:70–80.

- 40 Bergman MM, Scott J. Young adolescents' wellbeing and health-risk behaviours. *J Adolesc* 2001;24:183–97.
- 41 Pullman H, Allik J. The Rosenberg Self-esteem Scale: its dimensionality, stability and personality correlates in Estonian. *Pers Individ Dif* 2000;28:701–15.
- 42 Steunenberg B, Beekman ATF, Deeg DJH, et al.. Personality and the onset of depression in late life. *J Affect Disord* 2006;92:243–51.
- 43 Kerr M, Stattin H, Biesecker G, et al.. Relationships With Parents and Peers in Adolescence. In: Lerner RM, Easterbrooks MA, Mistry J, editors. *Handbook of psychology, Vol. 6, Developmental psychology*. NJ: John Wiley & Sons, 2003.
- 44 Reijneveld SA, Crone MR, Verhulst FC, et al.. The effect of a severe disaster on the mental health of adolescents: a controlled study. *Lancet* 2003;362:691–6.
- 45 Flay BR, Allred CG, Ordway N. Effects on the Positive Action program on achievement and discipline: two matched-control comparisons. *Prevention Sci* 2001;2:71–89.
- 46 Haney P, Durlak JA. Changing self-esteem in children and adolescents: a meta-analytic review. *J Clin Child Psychol* 1998;27:423–33.

Received 18 May 2009, accepted 23 November 2009