Development and Aging

Adolescent predictors and associates of psychosocial functioning in young men and women: 11 year follow-up findings from the Nord-Trøndelag Health Study

RUTH DERDIKMAN-EIRON,[1,2] ODIN HJEMDAL,[5] STIAN LYDERSEN,[1] GRETE H. BRATBERG[3,4] and MARIT S. INDREDAVIK[1,2]

[1]The Regional Centre for Child and Adolescent Mental Health (RBUP), Faculty of Medicine, Norwegian University of Science and Technology, Trondheim, Norway
[2]St. Olav's University Hospital, Trondheim, Norway
[3]HUNT Research Centre, Department of Public Health and General Practice, Faculty of Medicine, Norwegian University of Science and Technology, Levanger, Norway
[4]Department of Research and Development, Levanger Hospital, Health Trust Nord-Trøndelag, Norway
[5]Department of Psychology, Norwegian University of Science and Technology, Trondheim, Norway

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The aim of this paper was to investigate whether psychosocial functioning in adulthood (e.g., friends support, cohabitation, community connectedness and work satisfaction) could be predicted by mental health, subjective well-being, social relations and behavior problems in adolescence, and whether gender was a moderator in these associations. Data were obtained from a major population-based Norwegian study, the Nord-Trøndelag Health Study (HUNT), in which 517 men and 819 women completed an extensive self-report questionnaires at baseline (mean age 14.4 years) and at follow-up (mean age 26.9 years). Community connectedness as well as work satisfaction were predicted by subjective well-being. Cohabitation was predicted by male gender and frequency of meeting friends in adolescence, and friends support was predicted by frequency of meeting friends. Gender had a minor effect as a moderator. Frequency of meeting friends and subjective well-being seemed to be the strongest adolescent predictors of psychosocial functioning in young adulthood. These findings may have implications both for prevention and intervention in adolescence, as well as for future research.

Key words: Psychosocial functioning, adolescence, subjective well being, symptoms of anxiety and depression, friends support, longitudinal study.

Ruth Derdikman-Eiron, The Regional Centre for Child and Adolescent Mental Health (RBUP), Norwegian University of Science and Technology, NO-7491, Trondheim, Norway. Tel: + 972 54 4953123; fax: +47 73 55 15 39; e-mail: ruth.derdikman@ntnu.no

INTRODUCTION

A major developmental task of the individual is to become a functioning member of society. This achievement was concisely defined by Sigmund Freud (Erikson, 1963) as the ability to love and to work. Understanding adolescent factors which contribute to successful functioning in early adulthood is a major developmental issue, and it is important for interventions aimed at improving young adult outcomes (Burt & Roisman, 2010; Rutter, Kim-Cohen & Maughan, 2006). In this paper we have investigated whether mental health, social relations and behavior problems in adolescence predict psychosocial functioning in adult men and women.

A large body of research has linked adult psychopathology with childhood and adolescent psychopathology. Less is known on relations between mental health problems in adolescence and psychosocial functioning in adulthood (Lewinsohn, Rohde, Seeley, Klein & Gotlib, 2003). Externalizing symptoms may have long term predictive significance for a variety of negative outcomes such as antisocial behavior, contacts with the judicial system, substance abuse and work instability (Zahn-Waxler, Shirtcliff & Marceau, 2008). Co-morbid internalizing and externalizing problems in childhood present the highest risk for both legal offense and psychiatric disorders in adulthood among men (Sourander, Jensen, Davies et al., 2007). Furthermore, internalizing problems in adolescence present a risk both for internalizing problems in young adulthood, and for future problems with interpersonal relationships (Capaldi & Stoolmiller, 1999; Lewinsohn et al., 2003).

Subjective well-being is a different indicator of mental health, which refers to a personal, subjective evaluation as opposed to external criteria set by experts. It is comprised by people's multi-dimensional evaluations of their lives, and embraces a threefold structure, consisting of one cognitive component (life satisfaction) and two affective components, including both the presence of positive affect, and the relative absence of negative affect. These components capture distinct aspects of subjective well-being but are not entirely independent and are assumed to reflect one single underlying dimension (Nes, Roysamb, Tambs, Harris & Reichborn-Kjennerud, 2006). The growing research in subjective well-being and similar contemporary constructs such as life satisfaction, optimism and quality of life, conveys the notion that mental health is not merely an absence of symptoms of distress. Recent research has demonstrated that subjective well-being reflects a distinct valid measurement of mental health which is associated with a reduced risk for psychological and social problems and with longevity and work satisfaction (Bray & Gunnell, 2006). Subjective well-being is considered as a fairly stable trait across time, although influenced by immediate life circumstances (Nes et al., 2006; Vaillant, 2003).

Accounting for psychosocial functioning in adolescence is important in prospective studies, aiming to infer from adolescence to adulthood. However, only a few studies have included measures of adolescent functioning in addition to psychiatric symptoms, in predicting functioning in adulthood (Lewinsohn *et al.*, 2003). In the current study we address this gap by exploring both mental health indicators and psychosocial functioning measurements as predictors of adult psychosocial functioning. The mental health indicators were symptoms of anxiety and depression and subjective well-being, and the psychosocial functions were social relations and behavior at school.

Behavior problems in school reflect both externalizing symptoms and adaptive functioning. Externalizing symptoms may predict a variety of negative outcomes (Capaldi & Stoolmiller, 1999; Sourander *et al.*, 2007). Difficulties in social functioning are considered as significant domains of impairment in individuals with depression and are implicated as both precursors to and consequences of depressive symptoms in adolescents (Allen *et al.*, 2006). Although a large body of research has dealt with the relations between depression and social functioning, the literature on links between adolescence and early adulthood are scarce. Having more depressive symptoms at 15 years of age was associated with more increase in relationship conflict and less increase in positive problem solving as compared to adolescents with fewer depressive symptoms (Vujeva & Furman, 2011). A negative link between social competence in emerging adulthood and internalizing problems 10 years later was also found by Burt and Roisman (2010).

Gender is an important factor in the development of psychopathology (Zahn-Waxler *et al.*, 2008). Gender differences in prevalence of depression are well reported; the risk for an adolescent girl to be depressed is two to three times higher than the risk for an adolescent boy. This gap is consistent until women's menopause age (Nolen-Hoeksema, 2001; Rutter, 2007; Wichstrom, 1999; Zahn-Waxler *et al.*, 2008). Nonetheless, knowledge on gender differences in associations between anxiety and depression and psychosocial functioning is scarce and inconsistent (Derdikman-Eiron, Indredavik, Bratberg *et al.*, 2011; Scott & Collings, 2010). Since prevalence of depression is higher in women, it was postulated that their functioning will be more severely impaired than men's functioning (Lewinsohn *et al.*, 2003). Depression during adolescence was found to predict higher rates of marriage among younger women and subsequent marital dissatisfaction (Gotlib, Lewinsohn & Seeley, 1998). However, a recent large scale population based study found that men with either mood or anxiety disorders reported significantly more role, social and cognitive disability than did women with these disorders (Scott & Collings, 2010). These scarce and mixed findings call for more research on gender differences in the associations between mental health and functioning.

In our previous work, based on cross-sectional data of nearly 9,000 adolescents, we found that symptoms of anxiety and depression were more strongly associated with lower subjective well-being, self-esteem and psychosocial functioning in boys than in girls (Derdikman-Eiron *et al.*, 2011). In a follow-up four years later, these gender differences had increased (Derdikman-Eiron, Indredavik, Bakken *et al.*, 2012).

In this 11 year follow-up study, we have further explored the relations between adolescent mental health and functioning (e.g., symptoms of anxiety and depression, subjective well-being, frequency of meeting friends and behavioral problems at school) and adult psychosocial functioning (e.g., friends' support, cohabitation, community connectedness and work satisfaction) in men and women. The specific aims were to investigate whether:

(1) Adolescent mental health predicts psychosocial functioning in adulthood.
(2) Social relations and behavior problems in school in adolescence predict psychosocial functioning in adulthood.
(3) Gender is a moderator in the associations between adolescent mental health, social relations and behavior problems in school and adult psychosocial functioning.

METHOD

Sample and procedures

Data were taken from the Nord-Trøndelag Health Study (HUNT). The present paper is based on data from the first wave of the adolescent part of the study (young HUNT 1), completed in 1995–97 (baseline, T1) and the third wave of the adult part 2006–08 (follow-up, T2).

Acquisition of the data at baseline was mainly organized through the local junior high schools and senior high schools. Baseline participants were in 8th through 13th grade (age range 12.1–17.4, mean = 14.4). In all, 8,984 participants completed the questionnaire, 91% of those invited. About 11 years later, 1,346 (36% of eligible baseline participants) agreed to participate in a follow-up, 819 women and 517 men. The mean age was 26.9, range 19.0–31.0. No age differences were found between genders. The high attrition rate in this age group is well known from other studies, and can partially be explained by demographic reasons: The HUNT data was collected in the county of Nord-Trøndelag, which is mostly rural area without large cities or universities. As such, many young people who were registered as inhabitants of Nord-Trøndelag and thus invited to the follow-up, had left temporarily for higher education or job opportunities outside the county. We believe this is the main reason for the high attrition rate in this age group. In attempting to investigate if this study sample represented a selected part of the baseline study population, we have compared the mean baseline scores of the respondents with the non-respondents in regards to symptoms of anxiety and depression, subjective well-being, academic problems at school and behavior problems, and found no statistically significant differences between the groups.

The participants signed a written consent to participate at each time point. In addition, students younger than 16 years of age at baseline were asked to provide parental consent. Participants were instructed to complete the questionnaires individually. The questionnaires were identifiable by a bar code of the respondents' 11-digit personal identification number, which was encrypted to secure anonymity.

Measures

The full original questionnaires and their English translation are available at the HUNT website. Young Hunt questionnaire: http://www.ntnu.no/c/document_library/get_file?uuid=11d90eff-3b09-4867-9c8c-54d8d7738783&groupId=10304.

Adult HUNT questionnaires

We used the general questionnaire and the supplementary questionnaires for women and men aged 20–29. They can be obtained at:

http://www.ntnu.no/c/document_library/get_file?uuid=f9e499bf-e3d4-4cd0-925e-a5231cf9cf6e&groupId=10304.

Adolescent Variables (Young HUNT 1)

Symptoms of anxiety and depression were measured by a shortened version of the Symptom Check List for anxiety and depression (SCL 25). The short version, SCL 5, is a widely used self-administered questionnaire (Derogatis, 1983; Strand, Dalgard, Tambs & Rognerud, 2003). It has been translated into Norwegian and validated in the local population from the age of 16 (Tambs & Moum, 1993). Its reliability has been shown to be acceptable, and a mean cut-off score of SCL 5 > 2 has been suggested (Strand *et al.*, 2003) to account for the same prevalence rates of anxiety and depression as the original SCL 25 questionnaire. This cut-off score was applied in the present study to define the presence of symptoms of anxiety and depression. In the SCL 5, participants are asked to rate, using a four-point Likert scale, how much they have been bothered by the following thoughts and feelings during the previous 14 days: felt consistently afraid and anxious; felt tense or uneasy; felt hopelessness when thinking about the future; felt depressed or sad; and worried too much about various things. In the present study, the SCL 5 Cronbach's alpha was 0.80 in the whole sample; 0.80 and 0.77 for girls and boys, respectively.

The subjective well-being scale consisted of the following three questions: (1) "When you think about the way your life is going at present, would you say that you are by and large satisfied with life or are you mostly dissatisfied?"; (2) "In general, do you feel strong and in a good mood or tired and worn out?"; and (3) "Are you generally happy or sad?" Respondents answered according to a seven-point scale ranging from the extreme negative (1) to the extreme positive (7). Higher scores indicate higher subjective well-being. In the present study, Cronbach's alpha was 0.74 in total; 0.75 among the girls and 0.74 among the boys. The subjective well-being scale has been reported in a number of previous HUNT study publications (Moum, Naess, Sorensen, Tambs & Holmen, 1990). Questions 1 and 3 are almost identical with the subjective well-being questions used in The European Values Survey (EVS: Halman, 2001).

Frequency of meeting friends was calculated by taking the mean frequency of paying and receiving visits in the last week. Possible answers ranged from never (1) to four or more times (4).

Behavior problems at school were measured as part of school-related questions designed by the Norwegian Institute of Public Health. Participants were asked to consider 14 statements about school and to respond according to a four-point scale ranging from "never" (1) to "very often" (4). In a previous study using the HUNT data, these 14 statements were subjected to factor analysis (Storksen, Roysamb, Holmen & Tambs, 2006). The present study used one of these factors: "Behavior problems in school", which consisted of 4 items (highest loading item: "I am reprimanded by my teacher"). Cronbach's alpha, based on standardized items for these factors, was 0.65 for the whole sample, and 0.64 and 0.67 for girls and boys, respectively. High scores indicate more problems than low scores.

Adult Variables (HUNT 3)

The *cohabitation* variable refers to one question – living with a spouse (husband/wife or cohabitant) (0) or not (1).

Friends support was measured by two dichotomous variables: Do you have friends that can help you when you need them? (no (0), yes (1)). Do you have friends that you can speak to confidentially? (no (0), yes (1)). The final scores were dichotomized where a total score of 2 was scored as 1 and scores ranging from 0 to 1 were scored as 0.

The *community connectedness* scale was a sum of three items: I feel a strong sense of community with the people who live here; We do not trust each other here; People like living here. Possible answers varied from strongly disagree (1) to strongly agree (5). The answers were inversed in the second item. Thus, a high sum score indicates strong connectedness. The scale reached a Cronbach alpha of 0.64 in total; 0.64 for women and 0.66 for men.

Work satisfaction was measured by one variable: All things considered, how much do you enjoy your work? Answers ranged from not at all (1) to very much (4).

Socioeconomic status (SES) was measured by the participants' educational level and income in adulthood which were obtained from Statistics Norway. Income was not a valid measurement, as participants who were receiving students' loans from the government were classified as having a negative income. Hence it was decided to use educational level as indicator for SES. Educational level was a reliable indicator for SES in our previous research based on the same data set (Derdikman-Eiron *et al.*, 2011). The educational level was divided into six ascending categories according to the length and type of education, ranging from "7 years of elementary school" (1) to "Masters Degree or above" (6).

Statistical analyses

The prevalence of symptoms of anxiety and depression in adolescence was calculated, and the numbers of females and males in each group were compared using a chi-square test.

Binary logistic regression models were used to examine friends support and cohabitation. Linear regression model was used to investigate community connectedness, and proportional odds ordinal logistic regression model was used to explore work satisfaction. The odds ratio (OR) in the ordinal logistic regression has the same interpretation as would have the OR in standard (binary) logistic regression, if a cut-off were made between any two categories of the dependent variable. This assumption of equal ORs between the category cut-off values was in agreement with our data ($p = 0.41$). The independent variables (predictors) included symptoms of anxiety and depression score, subjective well-being, frequency of meeting friends, and behavior problems at school. Furthermore, gender and the interaction between each of these predictors and gender were included in the model. In cases where a significant interaction with gender was found, we report separate analyses for males and females. Else, we report analyses adjusted for gender. All analyses were adjusted for age. In addition, we performed alternative analyses adjusting for educational level. However, these practically gave the same results, and are not reported in the tables. Two-sided *p*-values < 0.05 were regarded as statistically significant. Data analyses were undertaken using the SPSS Statistics, version 18.0 (Armonk, NY:IBM).

RESULTS

Adolescent mental health and functioning

Table 1 shows mean scores of each of the predictors and associates, for men and women: Among women, 12.5% (98/783) had clinical level of symptoms of anxiety and depression in adolescence, compared to 5.7% (29/505) of the men. Table 2 displays frequencies or mean scores of the outcome variables by gender.

Adolescent predictors of psychosocial functioning in young adulthood

Friends support in adulthood was positively predicted by frequency of meeting friends (Table 3). There was no interaction effect of any of the predictors with gender.

Cohabitation was positively predicted by male gender and frequency of meeting friends in adolescence (Table 4). Men were 2.54 times more likely to live with a spouse than women. Men and women who met their friends more frequently as adolescents had approximately 1.3 times higher odds to live with a spouse as young adults. No interaction effect with gender was found.

Community connectedness was positively predicted by subjective well-being (Table 5). A significant interaction effect was found between gender and symptoms of anxiety and depression.

Work satisfaction was positively predicted by subjective well-being (Table 6). A significant interaction effect was found between gender and behavior problems at school.

DISCUSSION

In this study we investigated whether adolescent mental health and functioning could predict adult psychosocial functioning, and whether gender was a moderator in these associations. We found that subjective well-being and frequency of meeting friends seemed to be the strongest adolescent predictors of psychosocial functioning in young adulthood. Gender had a modest effect as moderator.

Subjective well-being is an indicator of mental health, which refers to a personal, subjective evaluation as opposed to external criteria set by experts. In the current study, it predicted work satisfaction and community connectedness in both genders. Subjective well-being may represent a concise measurement of perceived competence, which has been found to predict work satisfaction in adulthood (Bray & Gunnell, 2006; Masten, Desjardins, McCormick, Kuo & Long, 2010).

Community connectedness concerns the personal experience of being part of a broader social network. Subjective well-being was associated with a reduced risk for psychological and social problems in a study by Bray and Gunnell (2006). As such, it is plausible that adolescents with a higher subjective well-being are more able to feel a part of community and be a productive member in it, thus receiving more from their community, which further reinforces their motivation for community ties and activities.

Anxiety and depression in adolescence have been found to predict functioning in adulthood in some studies (Burt & Roisman, 2010; Lewinsohn *et al.*, 2003), but they had a minor effect in our study. Symptoms of anxiety and depression in adolescence did not predict any of the outcome variables. An interaction between such symptoms and gender was found in community connectedness. These findings are supported by previous research, showing that the predictive effect of adolescence psychopathology weakens or disappears when accounting for the adolescence level of psychosocial functioning (Lewinsohn *et al.*, 2003). The weak effect can be partially explained by the small number of participants who had symptoms of anxiety and depression along the years, the long time lag between the two

Table 1. *Mean scores (and standard deviations) of the adolescent variables by gender*

	Mean (SD)		
	Women	Men	*p*
Symptoms of anxiety and depression	1.51 (0.53)	1.33 (0.41)	<0.001
Subjective well-being	5.24 (0.88)	5.43 (0.82)	<0.001
Frequency of meeting friends	1.39 (0.35)	1.50 (0.44)	<0.001
Behavior problems at school	2.84 (0.72)	2.84 (0.79)	0.97

Note: Mean score comparisons between men and women were performed by independent sample *t*-tests.

Table 2. *Frequencies and mean scores of the adult variables by gender*

Outcome variable	Women	Men	*p*
Have friends support (%, number)	96.2 (788)	93.7 (494)	0.04
Cohabitation – live with a spouse (%, number)	73.9 (605)	56.5 (298)	<0.001
Community connectedness (mean, SD)	11.75 (2.43)	12.03 (2.25)	0.03
Work satisfaction (percent, number)			0.57
Very unsatisfied	1.1 (8)	1.1 (5)	
A little satisfied	7.5 (54)	3.7 (17)	
Pretty satisfied	49.4 (357)	54.8 (250)	
Very satisfied	42.0 (302)	40.4 (184)	

Notes: Frequency comparisons in frequency of meeting friends and cohabitation were performed using Chi-square test. Mean score comparisons in community connectedness were performed using independent sample *t*-test. Frequency comparisons in work satisfaction were performed using linear-by-linear test for association.

Table 3. *Adolescent predictors of friends support in adulthood – logistic regression*

Independent variables	Friends support OR (95% CI)	*p*	*p* value for interaction effect with gender
Male gender	1.55 (0.89 to 2.71)	0.12	
Symptoms of anxiety and depression	1.71 (0.84 to 3.51)	0.14	0.32
Subjective well-being	1.33 (0.91 to 1.94)	0.14	0.10
Frequency of meeting friends	1.67 (1.19 to 2.34)	0.003	0.44
Behavior problems at school	0.86 (0.43 to 1.73)	0.67	0.15

Table 4. *Adolescent predictors of cohabitation in adulthood – logistic regression*

Independent variables	Cohabitation OR (95% CI)	*p*	*p* value for interaction effect with gender
Male gender	2.54 (1.96 to 3.31)	*p* < 0.001	
Symptoms of anxiety and depression	1.02 (0.75 to 1.40)	0.91	0.58
Subjective well-being	1.12 (0.94 to 1.33)	0.21	0.61
Frequency of meeting friends	1.33 (1.13 to 1.57)	*p* < 0.001	0.77
Behavior problems at school	1.31 (0.93 to 1.85)	0.12	0.78

Table 5. *Adolescent predictors of community connectedness in adulthood – linear regression*

Independent variables	Community connectedness		*p* value for interaction effect with gender
	Unstandardized B	*p*	
Male gender	0.13 (−0.14 to 0.41)	0.35	
Symptoms of anxiety and depression	−0.16 (−0.48 to 0.16)	0.14	0.04[a]
Subjective well-being	0.46 (0.27 to 0.64)	*p* < 0.001	0.68
Frequency of meeting friends	0.16 (−0.02 to 0.33)	0.08	0.51
Behavior problems at school	0.14 (−0.21 to 0.49)	0.43	0.39

Note: [a]Results for separate analyses for each gender: Women 0.37 (−0.20 to 0.94), *p* = 0.21, Men −0.37 (−0.76 to 0.16), *p* = 0.06.

Table 6. *Adolescent predictors of work satisfaction in adulthood – ordinal regression*

Independent variables	Work satisfaction OR (95% CI)		*p* value for interaction effect with gender
		p	
Male gender	0.96 (0.74 to 1.23)	0.75	
Symptoms of anxiety and depression	0.90 (0.67 to 1.20)	0.48	0.16
Subjective well-being	1.47 (1.25 to 1.74)	*p* < 0.001	0.20
Frequency of meeting friends	0.98 (0.84 to 1.15)	0.80	0.93
Behavior problems at school	0.96 (0.75 to 1.23)	0.62	0.03[a]

Note: [a]Results for separate analyses for each gender: Women 1.31 (0.84 to 2.05), *p* = 0.24 Men 0.64 (0.41 to 1.01), *p* = 0.06.

waves and lack of information on symptom presence in the years between our measurements. The use of short self-report questionnaire to assess symptoms of anxiety and depression may also have contributed to this lack of findings.

Furthermore, subjective well-being in adolescence came out in the current study as a stronger predictor for adult functioning than symptoms of anxiety and depression. Both measurements are short versions of well validated tools; Symptoms of anxiety and depression questionnaire looks into quite concrete negative feelings and thoughts, prevailing in the last two weeks. Subjective well-being explores more general evaluation of mood and self-image, both positive and negative, of the person. Therefore, symptoms of anxiety and depression may reflect a temporary state, while subjective well-being refers to a more permanent construct, representing a relatively stable trait across time, thus more predictive during long-time lags. Moreover, subjective

well-being is found to be associated with a tendency to make positive attributions and ignore negative threats (DeNeve & Cooper, 1998), which can also influence one's evaluation of friends support, community connectedness and work satisfaction. Cohabitation is a more objective measurement, and thus less sensitive to attribution style. In addition, personality traits which are related to enhancement of personal relationships are reported to be associated with subjective well-being (DeNeve & Cooper, 1998). This finding may explain the role of subjective well-being in predicting community connectedness.

Our findings should draw attention to the role of subjective well-being as predictor of functioning. Friends support reflects the ability to maintain close and confident relations with a small number of people, and it was predicted by frequency of meeting friends.

Cohabitation is yet a special kind of social relations. This variable gives only general information whether a person is living with a spouse, but does not give any indication of the quality of the relationship. Still, cohabitation was predicted by frequency of meeting friends, indicating the importance of having friends in adolescence for later relational commitments. Interestingly, male gender was a strong predictor for living with a spouse. More research is needed in this area.

A significant interaction effect of gender was found in the association between symptoms of anxiety and depression and community connectedness. It is noteworthy that regression coefficients were not significant in either gender, but in men it almost reached statistical significance (*p* = 0.06). This may indicate that there is a negative effect in men, since a positive effect in women is less plausible. Thus, it is likely that the negative effect of symptoms of anxiety and depression on men's community connectedness was stronger than on women's. This result is in line with Scott and Collings (2010) who found that men with either mood or anxiety disorders reported significantly more role, social and cognitive disability than did women. It is also in line with our former research (Derdikman-Eiron *et al.*, 2012) in which we found that previous and ongoing symptoms of anxiety and depression had more negative consequences for boys' psychosocial functioning than for girls'. However, since this result is not very clear, it might as well represent a spurious finding, due to multiple hypothesis tests.

A significant interaction effect of gender was also found in the association between behavior problems at school and work satisfaction. This may indicate that there is a positive effect of behavior problems in women, or a negative effect in men. Alternatively, this interaction may be a false positive finding. In contrast to our expectations, few gender differences were found in this study.

The reasons for negative findings in this study may be partly methodological. During the long time lag between measurements, many factors could have affected the results, factors we have no control or information about. The use of self-report questionnaires in the HUNT study allowed for the investigation of a broad spectrum of phenomena in a large sample. However, it should be acknowledged that self-report questionnaires may be more prone to bias due to the possible influence of social desirability factors. Some of the measurement tools used in this study were shortened versions of widely used questionnaires. Although

these versions demonstrate good validity, as with all such instruments, they may involve reduced sensitivity. The use of more sensitive measurement tools might be helpful in portraying a more accurate picture of adolescent predictors and gender differences. Moreover, our outcome variables were not validated measurements, which might have contributed to reduced sensitivity. Another limitation of the study is a high attrition rate, but we found no significant differences between the respondents and non-respondents in symptoms of anxiety and depression, subjective well-being, frequency of meeting friends and behavior problems in adolescence. Thus we believe that the attrition rate had minimal effect on the results.

The strengths of this longitudinal study are the large number of subjects and the long time span it covers. It is one of few studies addressing the poorly investigated field of psychosocial functioning, taking into account the initial level of functioning (Lewinsohn *et al.*, 2003) and the possible moderator effect of gender.

Our findings may have implications for early identification, prevention and intervention. Subjective well-being and frequency of meeting friends may serve as important indicators for future psychosocial functioning, not less than symptoms of anxiety of depression or behavior problems at school. Improving social relations and elaborating issues relevant to subjective well-being should be the foci of intervention.

CONCLUSION

In this large prospective study, subjective well-being and frequency of meeting friends in adolescence were strong predictors for adult functioning in both genders. These findings may have implications for prevention and intervention in adolescence, as well as for future research.

REFERENCES

Allen, J. P., Insabella, G., Porter, M. R., Smith, F. D., Land, D. & Phillips, N. (2006). A social-interactional model of the development of depressive symptoms in adolescence. *Journal of Consulting and Clinical Psychology, 74,* 55–65.

Bray, I. & Gunnell, D. (2006). Suicide rates, life satisfaction and happiness as markers for population mental health. *Social Psychiatry and Psychiatric Epidemiology, 41,* 333–337.

Burt, K. B. & Roisman, G. I. (2010). Competence and psychopathology: Cascade effects in the NICHD Study of Early Child Care and Youth Development. *Development and Psychopathology, 22,* 557–567.

Capaldi, D. M. & Stoolmiller, M. (1999). Co-occurrence of conduct problems and depressive symptoms in early adolescent boys: III. Prediction to young-adult adjustment. *Development and Psychopathology, 11,* 59–84.

DeNeve, K. M. & Cooper, H. (1998). The happy personality: A meta-analysis of 137 personality traits and subjective well-being. *Psychological Bulletin, 124,* 197–229.

Derdikman-Eiron, R., Indredavik, M., Bakken, I., Bratberg, G., Hjemdal, O. & Colton, M. (2012). Gender differences in psychosocial functioning of adolescents with symptoms of anxiety and depression: longitudinal findings from the Nord-Trøndelag Health Study. *Social Psychiatry and Psychiatric Epidemiology, 47,* 1855–1863.

Derdikman-Eiron, R., Indredavik, M. S., Bratberg, G. H., Taraldsen, G., Bakken, I. J. & Colton, M. (2011). Gender differences in subjective well-being, self-esteem and psychosocial functioning in adolescents with symptoms of anxiety and depression: Findings from the Nord-Trøndelag health study. *Scandinavian Journal of Psychology, 52,* 261–267.

Derogatis, L. R. (1983). SCL–90–R. Administration, scoring and procedures manual. (2nd ed.). Baltimore, MD: Procedures Psychometric Research.

Erikson, E. H. (1963). Childhood and society (2nd ed.). New York: Norton.

Gotlib, I. H., Lewinsohn, P. M. & Seeley, J. R. (1998). Consequences of depression during adolescence: Marital status and marital functioning in early adulthood. *Journal of Abnormal Psychology, 107,* 686–690.

Halman, L. (2001). Source book of the 1999/2000 European Values Study Surveys. Tilburg: Tilburg University.

Lewinsohn, P. M., Rohde, P., Seeley, J. R., Klein, D. N. & Gotlib, I. H. (2003). Psychosocial functioning of young adults who have experienced and recovered from major depressive disorder during adolescence. *Journal of Abnormal Psychology, 112,* 353–363.

Masten, A. S., Desjardins, C. D., McCormick, C. M., Kuo, S. I. C. & Long, J. D. (2010). The significance of childhood competence and problems for adult success in work: A developmental cascade analysis. *Development and Psychopathology, 22,* 679–694.

Moum, T., Naess, S., Sorensen, T., Tambs, K. & Holmen, J. (1990). Hypertension labeling, life events and psychological well–being. *Psychological Medicine, 20,* 635–646.

Nes, R. B., Roysamb, E., Tambs, K., Harris, J. & Reichborn-Kjennerud, T. (2006). Subjective well-being: Genetic and environmental contributions to stability and change. *Psychological Medicine, 36,* 1033–1042.

Nolen-Hoeksema, S. (2001). Gender differences in depression. *Current Directions in Psychological Science, 10,* 173–176.

Rutter, M. (2007). Psychopathological development across adolescence. *Journal of Youth and Adolescence, 36,* 101–110.

Rutter, M., Kim-Cohen, J. & Maughan, B. (2006). Continuities and discontinuities in psychopathology between childhood and adult life. *Journal of Child Psychology and Psychiatry, 47,* 276–295.

Scott, K. M. & Collings, S. C. D. (2010). Gender and the association between mental disorders and disability. *Journal of Affective Disorders, 125,* 207–212.

Sourander, A., Jensen, P., Davies, M., Niemela, S., Elonheimo, H., Ristkari, T., Helenius, H., Sillanmäki, L., Piha, J., Kumpulainen, K., Tamminen, T., Moilanen, I. & Almqvist, F. (2007). Who is at greatest risk of adverse long-term outcomes? The Finnish from a boy to a man study. *Journal of the American Academy of Child and Adolescent Psychiatry, 46,* 1148–1161.

Storksen, I., Roysamb, E., Holmen, T. L. & Tambs, K. (2006). Adolescent adjustment and well-being: Effects of parental divorce and distress. *Scandinavian Journal of Psychology, 47,* 75–84.

Strand, B. H., Dalgard, O. S., Tambs, K. & Rognerud, M. (2003). Measuring the mental health status of the Norwegian population: A comparison of the instruments SCL-25, SCL-10, SCL-5 and MHI-5 (SF-36). *Nordic Journal of Psychiatry, 57,* 113–118.

Tambs, K. & Moum, T. (1993). How well can a few questionnaire items indicate anxiety and depression. *Acta Psychiatrica Scandinavica, 87,* 364–367.

Vaillant, G. E. (2003). Mental health. *American Journal of Psychiatry, 160,* 1373–1384.

Vujeva, H. M. & Furman, W. (2011). Depressive symptoms and romantic relationship qualities from adolescence through emerging adulthood: A longitudinal examination of influences. *Journal of Clinical Child and Adolescent Psychology*, *40*, 123–135.

Wichstrom, L. (1999). The emergence of gender difference in depressed mood during adolescence: The role of intensified gender socialization. *Developmental Psychology*, *35*, 232–245.

Zahn-Waxler, C., Shirtcliff, E. A. & Marceau, K. (2008). Disorders of childhood and adolescence: Gender and psychopathology. *Annual Review of Clinical Psychology*, *4*, 275–303.