

Childhood Peer Status and Adult Susceptibility to Anxiety and Depression. A 30-Year Hospital Follow-up

Bitte Modin · Viveca Östberg · Ylva Almquist

Published online: 1 October 2010
© Springer Science+Business Media, LLC 2010

Abstract This study examined the extent to which sixth grade peer status could predict anxiety and/or depression in 5,242 women and 5,004 men who were born in 1953 and whose hospital records were followed up from 1973–2003. The data used was the Stockholm Birth Cohort Study. While no association could be established for men, results indicated that women who held low peer status positions in childhood were at a considerably higher risk of anxiety and/or depression later in life compared to women in average status positions. Women who held popular positions during childhood did not differ significantly from their average counterparts. These findings persisted after adjusting for family- and child-related problem-load, perceived security at school, family constellation, socioeconomic status as well as the child's cognitive ability, ninth grade school marks and continuance to upper secondary school.

Keywords Peer status · 1953 cohort · Longitudinal · Anxiety · Depression · Sweden

Introduction

Social exclusion theory maintains that humans have an innate drive to avoid being excluded by others since being part of a social group is vital for survival (Baumeister and Tice 1990). Perceiving that one's inclusionary status in important social groups is less than desired can therefore result in negative

affective states such as anxiety and depression (Leary 1990). Growing up under conditions characterized by low social status have both immediate and long-term consequences for the individual's health (Galobardes et al. 2004; Östberg 2003; Östberg and Modin 2008). Low social status is closely connected with psychosocial adversity, including social exclusion, lack of social recognition and diminished social esteem (Sen 1992). Individuals in low status positions are generally ascribed a lower social value and a lower degree of competence by members of the surrounding group, or by society at large (Berger et al. 1977). Low status is therefore compatible with feelings such as stress, anxiety, insecurity, lack of self-confidence and shame (Ridgeway and Walker 1995). Having a low social status in childhood can derive from many different sources, but just as with adults it concerns the hardships of being "at the bottom" of a social hierarchy, lacking the means to obtain the social and material standards of the members of the surrounding society (Hasan 1989). Experiences of low social status during childhood may stem from the family's as well as from the child's own social standing within the various contexts of social life. The following study focuses on the long-term psychiatric implications of the latter, as indicated by Swedish sixth grade students' peer status among their classmates.

Peer Status

The school classroom is a setting where children spend substantial time with their peers, and is therefore of great significance for young people's social life. In all school classes, a structure of social relations develops over time, one aspect of which is the hierarchical arrangement of social positions ranked according to status. While the majority of pupils will be ascribed an average status position, a smaller number will be attributed a position

B. Modin (✉) · V. Östberg · Y. Almquist
Centre for Health Equity Studies (CHES),
Stockholm University/Karolinska Institutet,
SE-106 91 Stockholm, Sweden
e-mail: bmodin@chess.su.se

either at the top or at the bottom of this status distribution (Moreno 1953). The individual's position reflects his or her relation to the group as a whole, and can be seen as a marker of how far he or she is an accepted, integrated and respected member of the group. Peer status can be assessed by letting all children anonymously record which other children in the class they, for example, like best. These choices are then summarized to indicate a child's position in the group (Östberg and Modin 2008; Östberg 2003).

The status ascribed to a child by his or her classmates draws upon the entire palette of personal characteristics displayed by the child in the school setting (Gronlund 1959), including behaviors, competences and appearances in school. Such personal characteristics partly reflect individual traits, but may also be the result of past and present family circumstances as well as previous peer group experiences. In the Stockholm Birth Cohort, peer status has previously been shown to be most closely related to individual characteristics such as school performance and cognitive ability, but also positively correlated with the parent's social class and attitudes towards higher education (Stütz 1985). Furthermore, an individual's attained peer status also depends on circumstances within the group, such as group norms. Characteristics that are perceived as attractive or desirable in one school-class setting may be considered less significant, or even undesirable, in another (Boivin et al. 1995b). When measured through choices, peer nominations seldom cross the border of gender (Östberg 2003). Hierarchies nevertheless manifest themselves among both boys and girls although they may have somewhat different causes and consequences (Bell-Dolan et al. 1995). Thus, while boys' interactions typically reflect competition, dominance and multiple role interaction, girls tend to focus on matters concerning intimacy, self-disclosure and relationships (Rose-Krasnor 1997). This suggests that the social skills needed for reaching a certain peer status position may differ according to gender.

How Can Childhood Peer Status Evoke Later Anxiety and Depression?

Acute psychological stressors tend to elicit cortisol responses in the individual, and this has been shown to be particularly the case when distress arises from a social-evaluative threat (Dickerson and Kemeny 2004). Rejected children have been found to have significantly higher cortisol levels than their classmates (Gunnar et al. 2003). A recent study demonstrated both elevated saliva cortisol concentration and more depressed mood in a group of young adults who had been acutely rejected in an experimental situation. The authors proposed that frequent

and persistent peer rejection may cause recurrent and chronic increases in cortisol, thereby making the individual particularly susceptible to depression (Blackhart et al. 2007). Problematic peer relations can thus serve as a source of substantial psychological distress (Frankel 1990; Prinstein and Aikins 2004), something which eventually may develop into depression and/or anxiety (Dixon and Ahrens 1992). Low peer status has also been proposed as a vulnerability factor that may exacerbate the risks associated with an individual tendency to attribute stressful events to internal and stable causes (depressogenic attributional style) (Prinstein and Aikins 2004; Abramson et al. 1989). In the long term the reaction of others to individuals showing signs of anxiety and depressed mood could trigger a vicious circle whereby the individual's low social status is maintained and his/her depressive symptoms become increasingly reinforced (Coyne 1976; Hankin and Abramson 2001). Empirical studies confirm that problematic peer relationships during the school years are associated with social anxiety (La Greca and Lopez 1998) and depressive symptoms (Boivin et al. 1994; Hecht et al. 1998). Moreover, these associations seem to persist into adulthood (Bagwell et al. 2001).

Gender Differences in Anxiety and Depression

It is well-established that females are at greater risk of depression (Noble 2005; Piccinelli and Wilkinson 2000) and anxiety disorders (Altemus 2006; Clark et al. 2007). In Sweden, hospitalizations from mood disorders in 2007 were 1.5 times higher among women than among men (Lager 2009). Likewise during childhood and adolescence, internalizing symptoms are generally more common in females (Leadbeater et al. 1999). A recent review on this topic suggests that gender differences in friendship patterns may be an important part of the explanation behind this unresolved female disadvantage (Goldberg 2006). Goldberg argues that girls have a higher need for affiliative ties with other girls which may lead them to become more exposed to acute disappointments in confiding relationships, thereby increasing their overall preponderance to depression. Girls may also have a greater tendency to ruminate about events and emotions (Zahn-Waxler et al. 2000), a stronger physiological and psychological reactivity under conditions of interpersonal conflict and distress (Zahn-Waxler et al. 1995) and a greater tendency to blame themselves for peer problems (Rudolph 2002). Moreover, since girls also respond more emotionally to the problems of others, they may be stressed by a wider range of interpersonal contexts (Zahn-Waxler et al. 2000). For all these reasons, low peer status would be expected to be more closely related to anxiety and depression among girls, a hypothesis that has been empirically supported in

previous studies (Prinstein and Aikins 2004; La Greca and Lopez 1998).

Longitudinal Psychiatric Implications of Peer Status

A substantial body of research demonstrates that individuals with psychological and behavioral problems are assigned lower peer status positions (Newcomb et al. 1993; Rosenbaum Asarnow 1988; Strauss et al. 1987; Woodward and Fergusson 1999), but there is evidence for the reverse causation as well. For example, peer status has been shown to predict depressive symptoms irrespective of symptoms at an earlier time point (Kiesner 2002; Panak and Garber 1992). Longitudinal studies have also pointed to the importance of peer status for later depressive symptoms (Boivin et al. 1995a; Nolan et al. 2003; Vernberg 1990) and anxiety disorders (Bell-Dolan et al. 1995; Strauss et al. 1988) in children and adolescents. There is much less evidence regarding effects at later ages, but at least two studies have used register data to follow children up into young adulthood (Cowen et al. 1973; Roff and Wirt 1984). Both studies found that children with low peer ratings were at increased risk of mental health problems ten or more years later. Peer rejection in young adulthood has also been shown to predict self-reported depressive symptoms 12 years further along the life-span (Bagwell et al. 1998). To our knowledge, however, no previous study has prospectively investigated the relevance of childhood peer status on adult psychiatric diagnoses in middle adulthood.

Aim of the Study

The purpose of this study is to investigate the long-term psychiatric implications of children's sixth grade peer status. A plausible confounder in this relationship is the child's mental health at baseline, something which has been found to be important both for attained peer status (Hymel et al. 1990, 1993) and adult psychiatric health (Roza et al. 2003). We will adjust for both parental history of psychiatric problems and the cohort member's own potential problems in terms of delinquency and maladjustments. We will also adjust for the child's perceived security at school, which we assume partly reflects internalizing problems at the time of sixth grade. Family background in terms of parental social class and family constellation have been linked to both peer status (Östberg and Modin 2008) and later psychiatric disease (Weitoft et al. 2003; Murali and Oyebode 2004), and represent another set of possible confounders in the studied relationship. We will also evaluate cognitive ability and school performance, given that these are associated with psychiatric disorders (Batty et al. 2005; Isohanni et al. 1998)

as well as peer status (Almquist et al. 2010). The following questions will be empirically investigated:

- 1) Is there an association between sixth grade peer status position and in-patient hospitalization due to anxiety and/or depression between ages 20–50 years?
- 2) If so, are there any gender differences?
- 3) Can any such association be partly or fully explained by a) mental health status indicators at baseline, b) family social background, c) cognitive ability, or by d) school performance?

Method

Data Material

The data material used is the *Stockholm Birth Cohort Study* (SBC). This database was created in 2004/2005 by a probability matching of two longitudinal data sets: the *Stockholm Metropolitan Study* (SMS) consisting of all 15,117 children who were born in 1953 and who lived in the greater Stockholm area in 1963, and the *Swedish Work and Mortality Data Base 1980–2002* (WMD) consisting of all individuals, born before 1985, who lived in Sweden in 1980 or 1990 (Stenberg and Vågerö 2006; Stenberg et al. 2007). This matching facilitated continued registry-linkages from the 1980s onwards to the SMS, which had been de-identified in 1986. The probability matching resulted in a loss of less than 6% of the original study subjects ($n=823$), most of whom probably had died or emigrated before 1980.

The SBC ($n=14,294$) contains a multitude of information collected through both surveys and routine registries at various points in time up until 1983 (see Stenberg and Vågerö 2006). Of relevance for the present study is the so-called *School Study of 1966* which administered cognitive tests and gathered sociometric information. We define our study population as SBC members who attended sixth grade in Swedish speaking non-remedial classes of ten students or more in 1966 and who participated in the *School Study* ($n=11,561$). The primary reasons for attrition here were either that the subject had moved away from Stockholm by 1966 or that he/she had “jumped” or repeated a year in school (i.e. did not attend sixth grade in 1966). Of further importance here is the register linkage to data on the family of origin (The Social Welfare Registry 1953–65) as well as on the cohort members themselves (Child Welfare Registry 1953–65). Additional register linkage provided information on the fathers' social class in 1963, cohort members' ninth grade school marks, applications to upper secondary school and inpatient care as retrieved from the Stockholm county council between 1973 and 1980. The

probability matching of the SMS and the WMD also permitted continued nationwide follow-up of inpatient care from 1981 until 2003. Full information on all variables used in our analyses is available for 10,246 subjects, corresponding to 88.6% of the above defined study population and 67.7% of the original total sample.

Figure 1 provides a gender-specific overview of the process by which the final numbers of study subjects were selected is given in Fig. 1. As evident from the figure, more boys than girls were lost during this process (35% versus 29%). Subjects who were lost to attrition differed systematically from those who remained in terms of adverse circumstances across the life-course. Compared to the studied subjects, they had a higher prevalence of anxiety and/or depression (5.5% versus 3.2%), marginalized peer status positions (30.6% versus 10.3%), family- or child-related problem load (20.4% versus 10.5%) low parental social class (18.4% versus 14.8%), living with a single parent (14.1% versus 9.1%), low cognitive ability (53.6% versus 27.8%), school marks below average (38.8% versus 25%) as well as non-continuance to upper secondary school (61.2% versus 38.2%). Sensitivity analyses indicate that this selective attrition will most likely have resulted in an underestimation of the associations of interest.

Variables

Table 1 shows the gender-specific distribution of the dependent and independent variables used in the analyses. The studied outcome is hospital discharge diagnosis of anxiety and/or depression, two disorders known to be highly co-morbid (Altemus 2006). This was defined as the presence or the absence of a (first) hospitalization for anxiety disorder and/or major depressive disorder recorded in the Swedish National Patient Registry (NPR), covering all 20–26 county councils that exist(ed) in Sweden between 1973 and 2003. Reports on the quality of the NPR indicate good quality and a relatively low level of attrition (The National Board of Health and Welfare 2009). In 2006, the share of missing main diagnoses for psychiatric care was 6% and further 0.6% of the cases lacked personal identification number. The prevalence of hospitalization due to psychiatric diagnoses in Sweden decreased over the studied period, primarily as the result of a mental health care reform launched in 1995 (Arvidsson 2004). The diagnosis was made by a senior physician according to versions 8–10 of the International Classification of Diseases (WHO 2010).¹

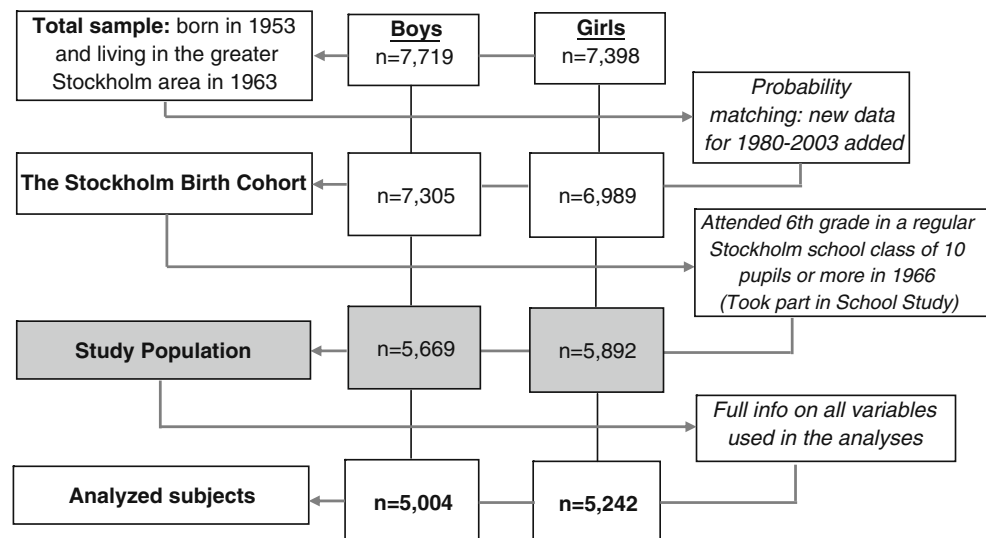
¹ *Anxiety disorder*. ICD 10 (i.e. diagnoses made in 1997–2003): F40.0, F40.1, F40.2, F41.0, F41.1, F42.0, F42.1, F43.0, F43.1; ICD 9 (i.e. diagnoses made in 1987–1996): 300A, 300C, 300D, 308B, 308C, 308D, 308E, 308F, 309.8; ICD 8 (i.e. diagnoses made in 1973–1986): 299, 300.0, 300.2, 300.3, 306.9, 307, 308, 781.5).

Major depressive disorder. ICD 10: F32, F33; ICD 9: 296.1, 296.6, 296.9, 298.0, 300.4, 311; ICD 8: 296.0, 296.1, 296.2, 296.8, 296.9, 298.0, 300.0, 300.4, 790.2.

Peer status (1966) was assessed by children's choices of classmates. All school classes in Stockholm were included except some classes composed of children with learning difficulties or who did not speak Swedish. Participation was voluntary but very few children who refused to take part. Pupils were asked to list the three children in the class that they preferred to work with. Choices were not to be ranked. The wording was "Whom in this class do you best like to work with in school". This means that the peer status measure used is based on positive nominations only, rendering the distinction of rejected (marginalized children who are actively disliked) and controversial (children who are popular by some and disliked by others) impossible (Coe et al. 1982). The decision not to include negative nominations at the time when these sociometric tests were carried out in 1966 was, as far as we understand, taken on ethical grounds. The choice of using a situation-specific, rather than a more general sociometric question (e.g. "Whom in this class do you like best?") has its history in the debate about how to pose sociometric questions in the 1950s and 1960s. Jacob Moreno, sometimes referred to as the father of sociometry, advocated the use of more specific, situation-dependent, questions. Multidimensional questions, he claimed, could be experienced as too abstract and unrealistic by the nominators (Moreno 1953), whilst other researchers favoured the more general kinds of sociometric questions (Bjerstedt 1956). In a meta-study of sociometric measures used in 77 different studies, the authors state: "It seems that in the history of peer relation research, researchers rarely distinguished between the two types of nominations (general vs. situation-specific). Both are referred to as sociometric measurements or peer nominations, assuming they are the same. We believe, indeed, that the two techniques are essentially the same" (Jiang and Cillesen 2005, p 5). Initial exploratory analyses revealed a non-linear relationship between number of sociometric choices and the studied health outcome, speaking against the use of peer status with its linear representation in the analyses. The number of received nominations was instead divided into four peer status categories: Marginalized (0 nominations); Peripheral (1 nomination); Accepted (2–3 nominations); and Popular (4 or more nominations). These categorizations have been used previously (Östberg and Modin 2008; Almquist et al. 2010). Given their placement in the centre of the hierarchy, 'accepted' children serve as the reference category in our analyses.

Class size (1966) is included as a covariate in all of the analyses since it affects the maximum number of peer nominations that a child can get. It varies between 10 and 40 students (mean=26.3) since children attending school classes of less than 10 pupils were excluded from analyses ($n=154$). A common way of measuring peer status is to

Fig. 1 Overview of the process by which the final numbers of study subjects were selected



divide nominations by class size. As for the sociometric measure used in this study, however, this mode of procedure would have been problematic since the number of choices given by the class mates is three irrespective of class size. This means that it takes four times as many nominations for a child with 40 classmates to reach an equivalent status position as a child who has ten classmates (Östberg 2003).

For comparative reasons, and because standardization by classrooms has been the established approach in this field of research for the past decades, a measure of *sociometric nominations standardized for classroom size* was also created, and divided into quartiles.

Family- or child-related problems at baseline are based on information collected from the Social Welfare Registry and the Child Welfare Registry and concern four different types of records: whether the father or the mother were ever registered as (1) being alcoholic and/or (2) having psychiatric problems in the Social Welfare Registry during the period 1953–65, and whether the cohort member were ever registered as (3) having family-related problems and/or (4) personal problems regarding delinquency or maladjustments (e.g. stealing, crimes of violence and abuse of alcohol or narcotics) in the Child Welfare Registry during the period 1953–65. Based on this information, four categories of “problem-load at baseline” were created ranging from 0 to 4 records of family- or child-related problems.

Information on *social class during childhood* was retrieved from the 1963 population register. In most cases it refers to the male head of the family. However, when information about the father was missing or where the mother had a higher occupational status than her husband, the social class measure is based on the female head of the household. The occupational classes discerned were (1) upper and middle class, (2) lower middle class, (3) skilled

workers, (4) unskilled workers and a small category of (5) unclassified. *Family constellation* is based on the 1964 Register of Population and Income. We used this to divide cohort members into those living with both the mother and the father and those who were living in any other family constellation.

Perceived security at school was assessed in the 1966 School Study and constitutes an index that varies between 0 (low security) and 10 (high security). It is based on the following ten items for which the respondent were asked to mark either yes (0) or no (1): (1) *Do you think that tests in school are too difficult?*, (2) *Do you often worry about things in school?*, (3) *Do you think it is unpleasant to answer questions in school?*, (4) *Do you sometimes feel lonely in school?*, (5) *Do you sometimes find it difficult to give the right answer when the teacher asks you a question?*, (6) *Do you easily give up when you find a task difficult at school?*, (7) *Are you sometimes afraid you will not know your lessons?*, (8) *Do you often get tired when you have tests at school?*, (9) *Do you often think you are a failure at school?*, and (10) *Would you like to attend another school instead of the one you are at now?*

Cognitive ability test scores comprised three sub-tests carried out in 1966: verbal, spatial and numerical (Härnqvist 1968). Cognitive scores were divided into thirds and included in the analyses as a categorical variable. Information on *ninth grade average mark* (1969) was collected from the School Boards of Stockholm City and comprises all school subjects except Gymnastics. Three categories of ninth grade marks are used: students with overall marks below average (1–2.49), students with overall marks around average (2.50–3.50), and students with overall marks above average (3.51–5.00). Information about *continuance to upper secondary school* (1969), finally, consists of two categories: students who applied for continuance to upper secondary school and those who did not.

Table 1 Gender-specific description of the variables selected for analyses (5,004 men and 5,242 women)

	Women		Men		Test for gender-dif.
	<i>n</i>	%	<i>n</i>	%	
Hosp. from anxiety and/or depression (1973–2003)					<i>p</i> =0.020
Yes	187	3.6	138	2.8	
No	5,055	96.4	4,866	97.2	
Peer status in school class (1966)					<i>p</i> <0.001
Marginalized (0 choices)	465	8.9	592	11.8	
Peripheral (1 choice)	1,100	21.0	965	19.3	
Accepted (2–3 choices)	2,060	39.3	1,776	35.5	
Popular (4 choices or more)	1,617	30.8	1,671	33.4	
Peer nominations divided by class size*100					<i>p</i> <0.001
Q1: First quartile (0–4.0)	1,304	26.1	1,260	24.0	
Q2: Second quartile (4.1–9.9)	1,172	23.4	1,399	26.7	
Q3: Third quartile (10.0–16.0)	1,261	25.2	1,419	27.1	
Q4: Fourth quartile (16.1–70.0)	1,267	25.3	1,164	22.2	
Family or child-related problem-load (1953–65)					<i>p</i> =0.105
No record	4,714	90.0	4,449	88.9	
One type of record	357	6.8	401	8.0	
Two types of records	150	2.9	129	2.6	
Three types of records or more	21	0.4	25	0.5	
Perceived security at school (1966)					<i>p</i> <0.001
Index (0–10)	Mean=6.05	Mean=6.81			
Parental social class (1963)					<i>p</i> =0.714
Upper and upper middle class	866	16.5	859	17.2	
Lower middle class	2,311	44.1	2,211	44.2	
Skilled workers	1,168	22.3	1,087	21.7	
Unskilled workers	788	15.0	730	14.6	
Not known	109	2.1	117	2.3	
Family constellation (1964)					<i>p</i> =0.186
Living with both parents	4,748	90.4	4,570	91.3	
Not living together with both parents	494	9.6	434	8.7	
Cognitive ability (1966)					<i>p</i> <0.001
Lowest third	1,650	31.5	1,198	23.9	
Middle third	1,925	36.7	1,750	35.0	
Highest third	1,667	31.8	2,056	41.1	
Ninth grade school marks (1969)					<i>p</i> =0.001
Below average	819	15.6	912	18.2	
Average	2,549	48.6	2,337	46.7	
Above average	1,874	35.8	1,755	35.1	
Continuance to upper second school (1969-)					<i>p</i> =0.018
No	2,120	40.4	1,857	37.1	
Yes	3,122	59.6	3,147	62.9	

Statistical Method

Logistic regression was applied in the statistical analyses. Since students in the same school class are not always independent from each other with regard to certain background characteristics, all analyses used Stata/SE's (9.0) cluster command to generate robust standard errors in relation to the school class. In the presentation of results, potential

explanatory factors behind the studied association will be investigated through a series of mutually exclusive models.

Results

A gender-specific description of the variables included in the analyses is presented in Table 1. The table shows that

hospitalization due to anxiety and/or depression is significantly more common among women. There is also a significant gender-difference in the distribution of peer status positions, with a higher prevalence of males in both marginalized and popular positions. Quartiles of nominations standardized by class size differ significantly by gender as well. There is no evidence of any difference between males and females for family background, but males seem to have an advantage over females in terms of perceived security at school, cognitive ability as well as school performance.

Table 2 presents the peer status specific distributions for hospitalization due to anxiety and/or depression as well as for the control variables used in the analyses. The selected control variables all point in the same direction: the lower the peer status position, the more adverse are the individual and family circumstances for both men and women. By contrast, the prevalence of hospitalization showed a different association in men and women. As shown in Table 2 and Fig. 2, there was no clear peer status gradient among men, whereas there was a considerable excess risk for women who held marginalized and peripheral positions during childhood. Results from similar analyses based on sociometric nominations standardized for class size pointed in the same direction.² Consequently, we now know the answers to the first two research questions put forward in this study. First of all, a significant association does seem to exist between sixth grade peer status and hospitalization due to later anxiety and/or depression. Secondly, however, it appears that this association is confined to women. Because of this lack of an association among men, we decided to restrict all further analyses to females despite the fact that a formal test for a two-way interaction between peer status and gender did not reach significance ($OR=0.87$, $p=0.222$).

Table 3 presents the odds ratios of hospitalization due to anxiety and/or depression among women. Although the main focus is on the effect of sixth grade peer status, the estimates for all independent variables selected for this study are presented in the table. The bivariate estimates for peer status are similar to those in Fig. 1, and reveal more than doubled odds of anxiety and/or depression among women who held marginal status positions in sixth grade compared to women in accepted positions. Women who held peripheral positions are also at a significantly increased risk of anxiety and/or depression (69%) vis-à-

vis their accepted counterparts. The estimate for popular girls indicates that they too are at a somewhat higher risk, although it does not reach statistical significance. As for the other independent variables, problem-load, cognitive ability and ninth grade school marks also predicted psychiatric health problems in adulthood, whereas there was no association with childhood social class, childhood family constellation, perceived security at school or continuance to secondary school.

Controlling for family and child related problem-load and perceived security at school does not greatly alter the initial influence of peer status (Model 1). There was therefore no evidence that the inverse association between childhood peer status and later hospitalization from anxiety and/or depression can be explained by family history of psychiatric and psychosocial problems, by a personal history of delinquency or maladjustment or by the child's sense of security at school. Similarly, the inclusion of parental social class and family constellation in Model 2 does not reduce the initial association between peer status and later hospitalization.

The excess risk of those in marginalized and peripheral positions does, however, decrease somewhat when thirds of cognitive ability is adjusted for in Model 3 and when marks and continuance to upper secondary school are included in Model 4. This suggests that the peer status measure used (i.e. preferred work-partner) partly reflects school ability. Nevertheless, even when cognitive ability, ninth grade marks and continuance to upper secondary school are adjusted for together with all of the other control variables in Model 5, women who held marginalized or peripheral positions still display an 87 and 60% higher risk, respectively, of becoming hospitalized with anxiety and/or depression as adults compared to women who held accepted status positions. As for our third and final research question, hence, we can conclude that cognitive ability and school performance, but not family social background and mental health indicators at baseline, seem to be part of the explanation behind the association between peer status and later hospitalization from anxiety and/or depression among females.

Curiously, women who held popular positions do not seem to be at an advantage vis-à-vis their accepted counterparts as might have been expected. If anything, the (non-significant) estimate for these women indicates a slightly elevated risk for psychiatric illness. In this final model, cognitive ability, ninth grade school marks and peer status are the only variables that demonstrate an overall statistically significant association with later hospitalization due to anxiety and/or depression.

Discussion

The results of this study suggest that low peer status positions during the school years predict adult hospital-

² Logistic regression of quartiles of classroom-standardized nominations on later anxiety/depression, using Q3 as the reference group (set to 1.0), revealed the following OR:s for women: Q1 (lowest) = 2.01 ($p=0.001$); Q2 = 1.40 ($p=0.132$); Q4 (highest) = 1.52 ($p=0.072$), and the following OR:s for men: Q1 = 1.17 ($p=0.501$), Q2 = 0.98 ($p=0.938$), Q4 = 0.94 ($p=0.788$). An overall significant association was found for women ($p=0.013$), but not for men ($p=0.789$).

Table 2 Description of the variables selected for analyses according men's ($n=5,004$) and women's ($n=5,242$) sixth grade peer status

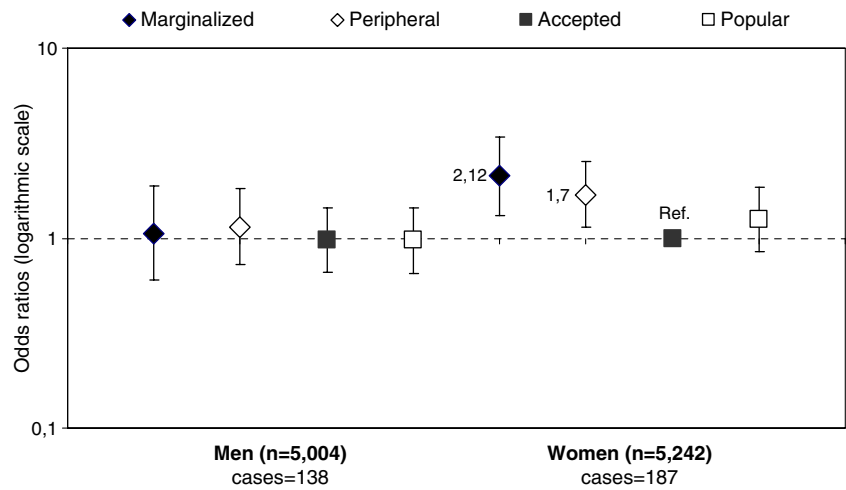
	Men				Women			
	%Marginalized	%Peripheral	%Accepted	%Popular	%Marginalized	%Peripheral	%Accepted	%Popular
Anxiety and/or depression								
Yes	2.9	3.1	2.6	2.6	5.6	4.6	2.7	3.4
No	97.1	96.9	97.4	97.4	94.4	95.4	97.3	96.6
Problem-load								
No record	84.8	85.3	89.1	92.3	86.2	86.7	90.2	92.9
One type of record	10.6	10.9	7.4	6.0	9.7	9.1	6.6	4.4
Two types of records	3.9	3.0	3.0	1.4	3.4	3.6	2.8	2.2
Three types of records or more	0.7	0.8	0.5	0.3	0.7	0.6	0.4	0.2
Perceived security at school								
Index (0–10)	6.1	6.3	6.8	7.4	5.2	5.7	6.0	6.6
Parental social class								
Upper and upper middle class	13.3	15.2	16.0	20.9	11.4	16.4	15.6	19.3
Lower middle class	40.9	41.5	45.7	45.3	39.8	41.1	44.4	47.0
Skilled workers	24.5	24.6	20.4	20.5	27.5	22.6	22.7	20.0
Unskilled workers	18.1	16.1	15.7	11.3	19.1	18.6	14.8	11.8
Not known	3.2	2.7	2.2	2.0	2.2	1.4	2.6	1.9
Family constellation								
Living with both parents	90.7	89.7	91.3	92.5	88.0	91.0	90.1	91.6
Not living with both parents	9.3	10.3	8.7	7.5	12.0	9.0	9.9	8.4
Cognitive ability								
Lowest third	34.6	32.2	24.3	15.0	47.7	40.2	32.8	19.2
Middle third	36.5	36.1	36.6	32.1	32.7	35.9	37.7	37.2
Highest third	28.9	31.7	39.1	53.0	19.6	23.9	29.5	43.6
Ninth grade school marks								
Below average	29.7	24.5	19.9	8.7	28.4	22.5	15.1	8.0
Average	51.4	52.3	49.1	39.3	53.1	52.2	50.4	42.6
Above average	18.9	23.2	31.0	52.0	18.5	25.4	34.5	49.4
Upper secondary school								
No	42.6	52.0	60.6	78.8	39.8	48.5	59.4	73.0
Yes	57.4	48.0	39.4	21.2	60.2	51.6	40.6	27.0

izations from anxiety and/or depression in girls but not in boys. Childhood social class, family constellation and child- and family-records in the Social Welfare Registries up until sixth grade could not explain this association. The effect did attenuate after adjustment for cognitive ability and school marks, however, suggesting that individual capabilities, rather than the family's social background, are the factors that are most important for the studied relationship. Nevertheless, even after adjusting for these characteristics, a significant excess risk remains among women who held marginalized and peripheral positions during childhood. The fact that peer relations, but not family characteristics were significantly associated with later developmental health is consistent

with previous empirical findings (Criss et al. 2009) and theory (Harris 1995).

We restricted the multivariate analyses to females since our initial analyses showed that no association existed among males. This gender-specificity is not universal for all types of health outcomes. In a study based on a 1950's cohort born in Aberdeen and followed up in early 2000s, peer status in childhood was linked to self-reported health in a graded fashion among both men and women (Östberg and Modin 2008). Among men, but not women, the excess risk among those who held low peer status positions during childhood was fully explained by their subsequent socio-economic career. The mechanisms through which childhood peer status operate to cause ill health in adulthood

Fig. 2 Logistic regression: Odds ratios (with 95% confidence intervals) of hospital admissions for anxiety disorder and/or major depressive disorder (1973–2003) according to sixth grade peer status and gender ($n=10,246$)



thus seem to differ between men and women. We believe that this may partly reflect the different standards by which boys and girls are evaluated in their striving for status and acceptance.

Based on long-standing ethnographic studies of preadolescents in the U.S., Adler et al. (1992), maintain that boys and girls fabricate “idealized images of masculinity and femininity” on which they model their behavior. They found that important status criteria for boys were aspects such as toughness, coolness, physical contests, and social skills reflecting an orientation towards autonomy, independence and self-reliance. Girls’ focal concerns were instead centred on physical appearance, socioeconomic status, academic success and social skills reflecting an orientation towards ascription and a culture of domesticity, compliance, intimacy and emotional expression (Adler and Adler 1998; Adler et al. 1992). In line with this, it has also been claimed that girls are socialized to be relationship-focused, whereas the socialization of boys are more directed towards individual achievement (Maccoby 1990). Girls also appear more likely than boys to engage in, and to become victims of, relational aggression, i.e. hostile acts in which relationships serve as the instrument of harm (Crick and Grotpeter 1995; Putallaz et al. 2004). Being low down in the pecking order may therefore entail more profound and persistent adversities for girls’ than for boys’ emotional development. The poorer social participation among girls in marginal and peripheral positions may also prevent them from developing and refining qualities that are important for future social relations, such as emotional intimacy and self-disclosure. A poor self-view, an inferior capability of building social relationships, together with women’s generally stronger physiological reactivity to rejection stress in terms of cortisol response (Stroud et al. 2002), are thus some possible factors that may have contributed to our findings that girls in low peer status positions appear to be at an increased risk of anxiety and depression later in life.

Another interesting finding was that girls who were popular in school do not seem to be more resilient to later-life risk of anxiety and/or depression than those in accepted positions. If anything, women who held popular positions during childhood appeared to be at an increased risk vis-à-vis their average counterparts. Although this trend was not statistically significant, it is still interesting to note that girls in accepted positions were the ones indicating the most favourable health as adults. Similar findings have been reported in other studies as well (Ueno 2005; Oldehinkel et al. 2007). Individuals in high status positions may, to a larger extent than those in average positions, become involved in situations where struggling for status, and loss of status, occurs (Merten 1997). Girls may also be more sensitive to these kinds of experiences, since notions of competition and conflict fits better into the domain of boys’ peer cultures. Moreover, the way in which peer status was assessed in this study means that the category of popular girls also contains an unknown number of controversial girls (popular girls who are also disliked), a group known to be at greater risk of various kinds of unhealthy behaviors (Miller-Johnson et al. 2003; Ollendick et al. 1992).

The current study has several weaknesses that need to be recognized. Firstly, we cannot verify the presumed causal link between childhood peer status and later hospitalization from anxiety and/or depression. Thus, although a longitudinal design allows for temporal ordering of the covariates, this is an insufficient basis for inferring causality. Secondly, the use of hospitalizations as a criterion for identifying psychiatric disease means that we fail to capture individuals who experienced clinically significant symptoms of anxiety and depression for which they were not hospitalized. Since we have no information about the extent to which hospitalizations from these diagnoses reflect the corresponding prevalence in the population, it is important to underscore that our findings only refer to subjects who experienced

Table 3 Odds ratios of hospital admissions for anxiety and/or depression (1973–2003) according to girls’ sixth grade peer status. Robust standard errors (RSE) were obtained through Stata/SE’s cluster command in relation to school class. All models are adjusted for class size

Covariates	Odds ratios of anxiety disorder or major depressive disorder among women (1973–2003)											
	Bivariate	RSE	Model 1	RSE	Model 2	RSE	Model 3	RSE	Model 4	RSE	Model 5	RSE
Peer status (1966):	<i>p</i> =0.006		<i>p</i> =0.014		<i>p</i> =0.006		<i>p</i> =0.021		<i>p</i> =0.022		<i>p</i> =0.045	
Marginalized	2.12	0.51	2.03	0.50	2.13	0.51	1.95	0.47	1.98	0.49	1.87	0.47
Peripheral	1.70	0.35	1.66	0.34	1.72	0.35	1.64	0.34	1.64	0.34	1.60	0.34
Accepted (ref.)	1.00		1.00		1.00		1.00		1.00		1.00	
Popular	(1.26)	0.25	(1.31)	0.26	(1.25)	0.25	(1.35)	0.27	(1.31)	0.26	(1.36)	0.27
Family or child-related problem-load (1953–65)	<i>p</i> =0.098		<i>p</i> =0.167								<i>p</i> =0.296	
No record (ref.)	1.00		1.00								1.00	
One type of record	(1.44)	0.38	(1.35)	0.36							(1.25)	0.36
Two types of records	2.06	0.76	(1.95)	1.95							(1.94)	0.76
Three types of records	(3.04)	2.18	(2.87)	2.09							(3.17)	2.59
Perceived security at school (1966)	<i>p</i> =0.107		<i>p</i> =0.305								<i>p</i> =0.517	
Index (0–10)	(0.95)	0.03	(0.97)	0.03							(0.98)	0.03
Parental social class (1963)	<i>p</i> =0.185				<i>p</i> =0.153						<i>p</i> =0.091	
Upper and upper middle class	(1.08)	0.30			(1.16)	0.33					(1.32)	0.39
Lower middle class	(1.51)	0.37			(1.57)	0.38					1.73	0.43
Skilled workers	(1.30)	0.34			(1.33)	0.35					(1.39)	0.36
Unskilled workers (ref.)	1.00				1.00						1.00	
Not known	(0.32)	0.32			(0.27)	0.29					(0.26)	0.28
Family constellation (1964)	<i>p</i> =0.562				<i>p</i> =0.287						<i>p</i> =0.551	
Living with both parents	(0.86)	0.22			(0.76)	0.20					(0.84)	0.24
Not living together with both parents (ref.)	1.00				1.00						1.00	
Cognitive ability (1966)	<i>p</i> <0.001						<i>p</i> <0.001				<i>p</i> =0.001	
Lowest third	1.61	0.27					1.54	0.27			(1.46)	0.29
Middle third	(0.72)	0.15					(0.71)	0.14			(0.70)	0.15
Highest third (ref.)	1.00						1.00				1.00	
Ninth grade school marks (1969)	<i>p</i> <0.001								<i>p</i> =0.002		<i>p</i> =0.017	
Below average	1.92	0.38							2.09	0.52	1.75	0.46
Average	(1.00)	0.20							(1.03)	0.19	(0.96)	0.19
Above average (ref.)	1.00								1.00		1.00	
Continuance to upper secondary school (1969)	<i>p</i> =0.252								<i>p</i> =0.231		<i>p</i> =0.128	
Yes	(0.85)	0.12							(1.24)	0.22	(1.37)	0.26
No (ref.)	1.00								1.00		1.00	
<i>n</i>	5,242		5,242		5,242		5,242		5,242		5,242	

() = Estimate not statistically significant on a 5% level

anxiety or depression so severe that it required at least one overnight stay at the hospital.

Thirdly, it could be argued that our sociometric question largely captures the chosen pupil’s school ability. However, being nominated a favourite work partner has been shown to reflect dimensions of friendship, likeability, and social inclusion in the used data material (Stütz 1985). Moreover, both school performance and cognitive ability were adjusted for in the analyses. Fourthly, peer status was

measured at a single point in time (sixth grade), which means that we cannot enunciate the degree to which the ascribed status positions remained stable across time. However, previous research has shown that status mobility is limited and that constancy over time is especially common for individuals in high and low status positions (Stensaasen and Sletta 2000). Similarly, in his analysis of third and fifth graders, Coie (1983) noted a surprising degree of continuity in sociometric indices across the

studied 5-year period. Fifthly, one could raise questions about the extent to which the structures of school classes in 1966 correspond to the conditions under which young people of today participate in school class settings. While trends in didactics and educational system reforms may have altered the preconditions of school classes in Sweden, there are few reasons to assume that the structures of school classes have become significantly different over time, or that the importance of the school class as a social context has changed. It is, however, possible that the new technological developments during the last decades, such as text messaging, online communities and instant messaging (Oksman and Turtiainen 2004), may have provided additional arenas for social interaction among young people.

Finally, it was not possible to take adult social circumstances into consideration in this study. This was largely due to the fact that the year when the hospitalization follow-up began (1973) was prior to the earliest point in adult life when information of this kind was available (1980) for the studied subjects. Hospitalization due to anxiety or depression is rare and although this study was based on a large number of subjects, an extensive follow-up time was considered necessary in order to get a sufficient number of cases. In conclusion, low childhood social status in the school class predicts an increased risk of hospitalization from anxiety and/or depression among Swedish women born in 1953. The specific mechanisms whereby this association comes into existence are, however, not fully understood. In this study we were able to take indicators of both family background and individual capabilities into consideration. Of these, only the latter seemed to have some bearing upon the studied relationship. We were also able to control for indicators of mental health at baseline in our analyses. The fact that these adjustments only led to a moderate reduction of the studied relationship suggests that early signs of emotional problems may not be the major explanation behind our findings.

We believe that this study makes an original contribution by documenting that an association indeed exists between sixth grade girls' peer status and their long-term risk of becoming hospitalized with anxiety and/or depression. It was not possible within the confines of this study to identify all possible confounders and mediators behind this relationship; neither do we claim that the association presented here is altogether casual. Nevertheless, we think it is plausible that peer status is part of a reciprocal process whereby individual propensities and the group responses they trigger act in concert to influence later-life mental health, and believe this is an important topic for future studies to explore. The lack of an association among men also raises plausible hypotheses regarding gender differences in peer cultures and ranking criteria and in biological

responses to rejection stress. Further understanding of these issues could provide clues on how to counterbalance the long-term psychiatric implications of problematic peer relations among girls during the school years.

Acknowledgements The creation and maintenance of the Stockholm Birth Cohort Data Base is a collaboration between the Centre for Health Equity Study (CHESS) and the Institute for Social Research (SOFI), financed by the Swedish Research Council. Sten-Åke Stenberg (SOFI) prepared the original Metropolitan Data Base, Denny Vågerö (CHESS) the follow-up data for 1980–2002 and Reidar Österman (CHESS) organized the probability matching of the two data sets. We are very grateful to Anna Goodman (London School of Hygiene and Tropical Medicine) for valuable input on the manuscript. The Swedish Council for Working Life and Social Research financed this study (FAS 2006-1637).

References

- Abramson, L. Y., Metalsky, G. I., & Alloy, L. B. (1989). Hopelessness depression: a theory-based subtype of depression. *Psychological Review*, *96*(2), 358–372.
- Adler, P. A., & Adler, P. (1998). *Peer power. Preadolescent culture and identity*. New Brunswick: Rutgers University Press.
- Adler, P. A., Kless, S. J., & Adler, P. (1992). Socialization to gender roles: popularity among elementary school boys and girls. *Sociology of Education*, *65*, 169–187.
- Almqvist, Y., Modin, B., & Östberg, V. (2010). Childhood social status in society and school: implications for the transition to higher levels of education. *British Journal of Sociology of Education*, *31*(1), 31–45.
- Altemus, M. (2006). Sex differences in depression and anxiety disorders: potential biological determinants. *Hormones and Behavior*, *50*, 534–538.
- Arvidsson, H. (2004). *After the 1995 Swedish Mental Health Care Reform—a follow up study of a group of severely mentally ill*. Göteborg University: Doctoral thesis. Göteborg, Sweden, 2004.
- Bagwell, C. L., Newcomb, A. F., & Bukowski, W. M. (1998). Preadolescent friendship and peer rejection as predictors of adult adjustment. *Child Development*, *69*(1), 140–153.
- Bagwell, C. L., Schmidt, M. E., Newcomb, A. F., & Bukowski, W. M. (2001). Friendship and peer rejection as predictors of adult adjustment. *New Directions for Child and Adolescent Development*, *91*, 25–49.
- Batty, G. D., Mortensen, E. L., & Osler, M. (2005). Childhood IQ in relation to later psychiatric disorder. Evidence from a Danish birth cohort study. *British Journal of Psychiatry*, *187*, 180–181.
- Baumeister, R. F., & Tice, D. M. (1990). Anxiety and social exclusion. *Journal of Social and Clinical Psychology*, *9*(2), 165–195.
- Bell-Dolan, D., Foster, S. L., & Christopher, J. S. (1995). Girls' peer relations and internalizing problems: are socially neglected, rejected, and withdrawn girls at risk? *Journal of Clinical Child Psychology*, *24*(4), 463–473.
- Berger, J., Fisek, M. H., Norman, R. Z., & Zelditch, M. (1977). *Status characteristics and social interaction: An expectation-states approach*. New York: Elsevier.
- Bjerstedt, Å. (1956). The interpretation of sociometric status scores in the class room. *Nordisk Psykologi*, *8*, 1–14.
- Blackhart, G., Eckel, L., & Tice, D. (2007). Salivary cortisol in response to acute social rejection and acceptance by peers. *Biological Psychology*, *75*, 267–276.

- Boivin, M., Poulin, F., & Vitaro, F. (1994). Depressed mood and peer rejection in childhood. *Development and Psychopathology*, *6*, 483–498.
- Boivin, M., Hymel, S., & Bukowski, W. M. (1995a). The roles of social withdrawal, peer rejection, and victimization by peers in predicting loneliness and depressed mood in childhood. *Development and Psychopathology*, *7*, 765–785.
- Boivin, M., Dodge, K. A., & Coie, J. D. (1995b). Individual-group behavioural similarity and peer status in experimental play groups of boys: the social misfit revisited. *Journal of Personality and Social Psychology*, *69*, 269–279.
- Clark, C., Rodgers, B., Caldwell, T., Power, C., & Stansfeld, S. (2007). Childhood and adulthood psychological ill health as predictors of midlife affective and anxiety disorders. *Archives of General Psychiatry*, *64*(6), 668–678.
- Coie, J. D. (1983). Continuities and changes in children's social status. A five-year longitudinal study. *Merrill-Palmer Quarterly*, *29*(3), 261–281.
- Coie, J. D., Dodge, K. A., & Coppotelli, H. (1982). Dimensions and types of social status: a cross-age perspective. *Developmental Psychology*, *18*(4), 557–570.
- Cowen, E. L., Pederson, A., Babigian, H., Izzo, L. D., & Trost, M. A. (1973). Long-term follow-up of early detected vulnerable children. *Journal of Consulting and Clinical Psychology*, *41*(3), 438–446.
- Coyne, J. C. (1976). Depression and the response of others. *Journal of Abnormal Psychology*, *85*(2), 186–193.
- Crick, N. R., & Grotpeter, J. K. (1995). Relational aggression, gender, and social-psychological adjustment. *Child Development*, *66*, 710–722.
- Criss, M. M., Shaw, D. S., Moilanen, K. L., Hitchings, J. E., & Ingoldsby, E. M. (2009). Family, neighborhood and peer characteristics as predictors of child adjustment: a longitudinal analysis of additive and mediation models. *Social Development*, *18*(3), 511–535.
- Dickerson, S. S., & Kemeny, M. E. (2004). Acute stressors and cortisol responses: a theoretical integration and synthesis of laboratory research. *Psychological Bulletin*, *130*(3), 355–391.
- Dixon, J. F., & Ahrens, A. H. (1992). Stress and attributional style as predictors of self-reported depression in children. *Cognitive Therapy and Research*, *16*(6), 623–634.
- Frankel, K. A. (1990). Girl's perception of peer relationship support and stress. *Journal of Early Adolescence*, *10*(1), 69–88.
- Galobardes, B., Lynch, J. W., & Smith, G. D. (2004). Childhood socioeconomic circumstances and cause-specific mortality in adulthood: systematic review and interpretation. *Epidemiological Review*, *26*, 7–21.
- Goldberg, D. (2006). The aetiology of depression. *Psychological Medicine*, *36*(10), 1341–1347.
- Gronlund, N. E. (1959). *Sociometry in the classroom*. New York: Harper & Brothers.
- Gunnar, M. R., Seban, A. M., Tout, K., Donzella, B., & van Dulmen, M. M. H. (2003). Peer rejection, temperament, and cortisol activity in preschoolers. *Developmental Psychobiology*, *43*, 346–358.
- Hankin, B. L., & Abramson, L. Y. (2001). Development of gender differences in depression: an elaborated cognitive vulnerability-transactional stress theory. *Psychological Bulletin*, *127*(6), 773–796.
- Härnqvist, K. (1968). Relative changes in intelligence from 13 to 18. *Scandinavian Journal of Psychology*, *9*, 50–82.
- Harris, J. R. (1995). Where is the child's environment? A group socialization theory of development. *Psychological Review*, *102* (3), 458–489.
- Hasan, J. (1989). Way-of-Life. Stress and differences in morbidity between occupational classes. In J. Fox (Ed.), *Health inequalities in European countries*. Aldershot: Gower.
- Hecht, D. B., Inderbitzen, H. M., & Bukowski, A. L. (1998). The relationship between peer status and depressive symptoms in children and adolescents. *Journal of Abnormal Child Psychology*, *26*(2), 153–160.
- Hymel, S., Rubin, K. H., Rowden, L., & LeMare, L. (1990). Children's peer relationships: longitudinal prediction of internalizing and externalizing problems from middle to late childhood. *Child Development*, *61*, 2004–2021.
- Hymel, S., Bowker, A., & Woody, E. (1993). Aggressive versus withdrawn unpopular children: variations in peer and self-perceptions in multiple domains. *Child Development*, *64*, 879–896.
- Isohanni, I., Järvelin, M. R., Nieminen, P., Jones, P., Rantakallio, P., & Jokelainen, J. (1998). School performance as a predictor of psychiatric hospitalization in adult life. A 28-year follow-up in the Northern Finland 1966 Birth Cohort. *Psychological Medicine*, *28*, 967–974.
- Jiang, X. L., & Cillessen, A. H. (2005). Stability of continuous measures of sociometric status: a meta-analysis. *Developmental Review*, *25*, 1–25.
- Kiesner, J. (2002). Depressive symptoms in early adolescence: their relations with classroom problem behaviour and peer status. *Journal of Research on Adolescence*, *12*(4), 463–478.
- Lager, A. (2009). Varför drabbas kvinnor oftare av ångest och depression? [*Why are women more often affected by worries, anxiety and depression?*]. Östersund: Report from the Swedish National Institute of Public Health.
- La Greca, A. M., & Lopez, N. (1998). Social anxiety among adolescents: linkages with peer relations and friendships. *Journal of Abnormal Child Psychology*, *26*(2), 83–94.
- Leadbeater, B. J., Kuperminc, G. P., Blatt, S., & Hertzog, C. (1999). A multivariate model of gender differences in adolescents' internalizing and externalizing problems. *Developmental Psychology*, *35*(5), 1268–1282.
- Leary, M. R. (1990). Responses to social exclusion: social anxiety, jealousy, loneliness, depression, and low self-esteem. *Journal of Social and Clinical Psychology*, *9*(2), 221–229.
- Maccoby, E. E. (1990). Gender and relationships. A developmental account. *American Psychologist*, *45*(4), 513–520.
- Merten, D. (1997). The meaning of meanness: popularity, competition and conflict among junior high school girls. *Sociology of Education*, *70*, 175–191.
- Miller-Johnson, S., Costanzo, P. R., Coie, J. D., Rose, M. R., Browne, D. C., & Johnson, C. (2003). Peer social structure and risk-taking behaviors among African American early adolescents. *Journal of Youth and Adolescence*, *32*(5), 375–384.
- Moreno, J. L. (1953). *Who shall survive? Foundations of sociometry, group psychotherapy and sociodrama*. New York: Beacon House.
- Murali, V., & Oyebode, F. (2004). Poverty, social inequality and mental health. *Advances in Psychiatric Treatment*, *10*, 216–224.
- Newcomb, A. F., Bukowski, W. M., & Pattee, L. (1993). Children's peer relations: a meta-analytic review of popular, rejected, neglected, controversial and average sociometric status. *Psychological Bulletin*, *113*(1), 99–128.
- Noble, R. E. (2005). Depression in women. *Metabolism Clinical and Experimental*, *54*(Suppl), 49–52.
- Nolan, S. A., Flynn, C., & Garber, J. (2003). Prospective relations between rejection and depression in young adolescents. *Journal of Personality and Social Psychology*, *85*(4), 745–755.
- Oksman, V., & Turtiainen, J. (2004). Mobile communication as a social stage: meanings of mobile communication in everyday life among teenagers in Finland. *New Media & Society*, *3*, 319–339.
- Oldehinkel, A. J., Rosmalen, J. G., Veenstra, R., Dijkstra, J. K., & Ormel, J. (2007). Being admired or being liked: classroom social

- status and depressive problems in early adolescent girls and boys. *Journal of Abnormal Psychology*, 35, 417–427.
- Ollendick, T. H., Weist, M. D., Borden, M. C., & Greene, R. W. (1992). Sociometric status and academic, behavioural, and psychological adjustment: a five-year longitudinal study. *Journal of Consulting and Clinical Psychology*, 60(1), 80–87.
- Östberg, V. (2003). Children in classrooms: peer status, status distribution and mental well-being. *Social Science and Medicine*, 56, 17–29.
- Östberg, V., & Modin, B. (2008). Status relations in school and their relevance for health in a life course perspective. *Social Science & Medicine*, 66, 835–848.
- Panak, W., & Garber, J. (1992). Role of aggression, rejection, and attributions in the prediction of depression in children. *Development and Psychopathology*, 4, 145–165.
- Piccinelli, M., & Wilkinson, G. (2000). Gender differences in depression. *British Journal of Psychiatry*, 177, 486–492.
- Prinstein, M. J., & Aikins, J. W. (2004). Cognitive moderators of the longitudinal association between peer rejection and adolescent depressive symptoms. *Journal of Abnormal Child Psychology*, 32(2), 147–158.
- Putallaz, M., Kupersmidt, J. B., Coie, J. D., McKnight, K., & Grimes, C. L. (2004). A behavioural analysis of girls' aggression and victimization. In M. Putallaz & K. L. Bierman (Eds.), *Aggression, antisocial behavior, and violence among girls: A developmental perspective*. New York: Guilford Press.
- Ridgeway, C. L., & Walker, H. A. (1995). Status structures. In K. S. Cook, G. A. Fine, & J. S. House (Eds.), *Sociological perspectives on social psychology*. Boston: Allyn & Bacon.
- Roff, J. D., & Wirt, R. D. (1984). Childhood social adjustment, adolescent status, and young adult mental health. *American Journal of Orthopsychiatry*, 54(4), 595–602.
- Rose-Krasnor, L. (1997). The nature of social competence: a theoretical review. *Social Development*, 6(1), 111–135.
- Rosenbaum Asarnow, J. (1988). Peer status and social competence in child psychiatric inpatients: a comparison of children with depressive, externalizing, and concurrent depressive and externalizing disorders. *Journal of Abnormal Child Psychology*, 16(2), 151–162.
- Roza, S. J., Hofstra, M. B., van der Ende, J., & Verhulst, F. C. (2003). Stable prediction of mood and anxiety disorders based on behavioural and emotional problems in childhood: a 14-year follow-up during childhood, adolescence, and young adulthood. *American Journal of Psychiatry*, 160, 2116–2121.
- Rudolph, K. D. (2002). Gender differences in emotional responses to interpersonal stress during adolescence. *Journal of Adolescent Health*, 30(4), 3–13.
- Sen, A. (1992). *Inequality reexamined*. Oxford: Clarendon.
- Stenberg, S. Å., & Vågerö, D. (2006). Cohort profile: the Stockholm birth cohort of 1953. *International Journal of Epidemiology*, 35(3), 546–548.
- Stenberg, S. Å., Vågerö, D., Österman, R., Arvidsson, E., von Otter, C., & Janson, C.-G. (2007). Stockholm Birth Cohort Study 1953–2003: a new tool for life-course studies. *Scandinavian Journal of Public Health*, 35(1), 104–110.
- Stensaasen, S., & Sletta, O. (2000). *Grupprocesser [Group processes]*. Stockholm: Natur och Kultur.
- Strauss, C. C., Frame, C. L., & Forehand, R. (1987). Psychosocial impairment associated with anxiety in children. *Journal of Clinical Child Psychology*, 16(3), 235–239.
- Strauss, C., Lahey, B., Frick, P., Frame, C., & Hynd, G. (1988). Peer social status of children with anxiety disorders. *Journal of Consulting and Clinical Psychology*, 56(1), 137–141.
- Stroud, L. R., Salovey, P., & Espel, E. (2002). Sex differences in stress responses: social rejection versus achievement stress. *Biological Psychiatry*, 52, 318–327.
- Stütz, G. (1985). *Kamratstatus [Peer status]*. Doctoral thesis. Stockholm University.
- The National Board of Health and Welfare. (2009). *Kvalitet och innehåll i Patientregistret [Quality and contents of the Swedish National Patient Registry]*. Stockholm: Report from Centre for Epidemiology.
- Ueno, K. (2005). The effects of friendship networks on adolescent depressive symptoms. *Social Science Research*, 34, 484–510.
- Vernberg, E. M. (1990). Psychological adjustment and experiences with peers during early adolescence: reciprocal, incidental, or unidirectional relationships? *Journal of Abnormal Child Psychology*, 18(2), 187–198.
- Weitoft, G. R., Hjern, A., Haglund, B., & Rosén, M. (2003). Mortality, severe morbidity, and injury in children living with single parents in Sweden: a population-based study. *The Lancet*, 361, 289–295.
- WHO (2010). International classification of diseases: <http://www.who.int/classifications/icd/en/>
- Woodward, L. J., & Fergusson, D. M. (1999). Childhood peer relationship problems and psychosocial adjustment in late adolescence. *Journal of Abnormal Child Psychology*, 27(1), 87–104.
- Zahn-Waxler, C., Cole, P. M., Welsh, J. D., & Fox, N. A. (1995). Psychophysiological correlates of empathy and prosocial behaviors in preschool children with behavior problems. *Development and Psychopathology*, 7, 27–48.
- Zahn-Waxler, C., Klimes-Dougan, B., & Slattery, M. J. (2000). Internalizing problems of childhood and adolescence: prospects, pitfalls, and progress in understanding the development of anxiety and depression. *Development and Psychopathology*, 12, 443–466.