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Does Adolescent Affect Impact Adult Social Integration? Evidence from the British 1946 Birth Cohort

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Abstract

Using data from the MRC National Survey of Health and Development (the British 1946 birth cohort), we take a life course approach with a sociology of mental health framework to examine the relationship between adolescent affect and adult social integration. The results suggest that being observed as anxious or sad in adolescence has long-term effect on adult social integration. These associations are not explained by adult mental health or socioeconomic status, for the most part. The results demonstrate support for social selection processes between adolescent mental health and adult social outcomes and suggest a disparate effect of type of adolescent affect on adult social outcomes.

Keywords

Mental health; Social integration; Social networks; Social selection

Introduction

Sociologists have shown that high levels of social integration promote positive mental health by increasing the degree to which people are connected to others through social network groups and communities (Durkheim, [1897] 1954; House et al., 1988; Lin et al., 1999; Turner and Turner, 1999). Yet less is understood about the relationship between the consequences of poor mental health early in life and adult social integration. Poor mental health and well-being early in life may impair later social participation by hindering the capacity of developing and maintaining social relationships (Thoits and Hewitt, 2001), as well as educational and occupational attainment (Kessler et al, 1995). In this paper, the Medical Research Council (MRC) National Survey of Health and Development (NSHD-the British 1946 national birth cohort study) provide the opportunity to examine this type of relationship using life course data. Specifically, we test whether observed adolescent affect is associated with adult social integration.

This study is organized around two dominant perspectives, sociology of mental health and the life course. From a sociological perspective, social arrangements and processes are fundamental to understanding both the causes and consequences of poor mental health (Aneshensel and Phelan, 1999). Combining this proposition with a life course perspective that emphasizes the convergence of social status experiences over time, we consider social factors that are commonly used to distinguish patterns of social integration to integration to highlight the accumulated effect of occupying ascribed and achieved statuses, and access, or lack thereof, to material and psychosocial resources.

Sociology of mental health

A sociological framework for mental health focuses on social variation in the prevalence of symptoms signifying psychological distress, and how symptom identification, classification, and meaning influence our understanding of the social origins and consequences of poor mental health (Aneshensel and Phelan, 1999). Many sociologists would argue that the general focus of sociology of mental health concentrates on differences in signs and symptoms of mental health, considered along a continuum, rather than rates of diagnosed disorders (Mirowsky, et al., 2000). Mental health outcomes utilised in sociological research often are termed 'psychological distress,' which generally refers to moods of depression and anxiety (Mirowsky and Ross, 1989).

Moods or affects associated with depression and anxiety are common among adults (Singleton et al., 2001) and adolescents (Cohen et al., 1993), and are strongly associated with individual behaviours and characteristics, particularly those that become meaningful in social relationships. The co-occurrence between depression and anxiety generally results in their joint consideration and measurement (Mirowsky, et al., 2000). From a sociological perspective, being able to differentiate between the two potentially offers an understanding of how each contributes to social processes related to beliefs, meanings, or behaviours, such as social integration, and social exclusion. In this analysis, we considered that adolescent anxious and sad affect may differentially impact social integration. This inquiry was motivated by work by Pine et al. (1998) on differentiations between anxiety and depression in associations between adolescent and adult mental health.

Affect in the context of adolescence

Using a life course perspective, we assume that social and personality development are integral to, and have long-term consequences for, access to resources and networks, links to community through social integration, and interpersonal exchanges within social networks. This assumption is rooted in the literature demonstrating that adolescent mental health is related to adult experiences, circumstances, and interpersonal relationships (McLeod and Kaiser, 2004; McLeod and Shanahan, 1996).

Adolescence is a unique period over the life course in the formation of the self and identity development that generally involves changes in self-perception, self-esteem, and self-efficacy (Bergman and Scott, 2001; Wadsworth, 1991). This is often coupled with seeking independence from family and expanding coping repertoires. During adolescence, many individuals begin to exhibit symptoms related to psychological distress, often in response to social and familial environmental demands and changes (Lewinshon et al., 1993; Steinberg and Sheffield Morris, 2001). Adolescence is a time when emotional affect, as responses to the social environment, becomes more obvious; this influences developing social ties which, in turn, may impact later social behaviours (Lin, 1999).

Family and school environments are likely contexts to observe adolescent mental health characteristics. In this paper, we rely on the observations of secondary school teachers for our main variables of interest, anxious and sad affect in adolescence. Studies that have utilised similar indicators found that teachers identify psychological distress more accurately than information gathered from parents or the children themselves, and their assessments predict future psychological distress more accurately (Kresanov et al., 1998; Sourander et al., 2004).

Mental health and socio-economic status

Sociological mental health research generally focuses on the distribution of social and economic resources and how related inequalities contribute to differences in outcomes

(Reiker and Bird, 2000). With this in mind, we consider the overarching and pervasive influence of ascribed and achieved socio-economic statuses (SES) over the life course on observed affect and adult social outcomes. Socio-economic status is defined here as positions that represent 'the structural arrangements in which individuals are embedded' (Pearlin 1989; 241), such as parents and own social class, education, and income. Socio-economic status influences both patterns of mental health and social integration by impacting access to resources and responses to social environments (Aneshensel and Phelan, 1999; Mirowsky et al., 2000; Pearlin, 1989).

Social integration

In the present study, social integration refers to involvement with and attachment to individuals and networks through participation in social organizations. Conceptually linked to social integration is both the utility of size, density, and quality of social networks (Lin and Peek 1999; Lin et al., 1999). Social integration gives access to the interpersonal networks where norms and beliefs are set and collective sentiments shared by its members. The function of social networks developed through participation in organizations involves instilling internalized standards of behaviour, sources of information, and increasing opportunities for social network members to provide social support.

In our analysis, we include the earliest available social support measure, parental participation in schooling, based on evidence of a relationship between less parental social support and more psychological symptoms reported by children (Shaw et al., 2004), and less early social support associated with children being less likely to seek out environments that provide access to resources, social support, and a sense of belongingness (Wickrama et al., 1997). In addition, Douglas (1964) contends that social support through parental participation in schooling in this cohort potentially increased receptivity to learning and the chances for greater educational attainment. Notably, several studies have found parental involvement in education to vary by parental characteristics, such as social class, education level, and gender (Eccles and Harold 1996; Kohl et al. 2000). In fact, early evidence from this cohort showed that parents in non-manual social class had greater interest in their children's progress at school, as indicated by more frequent school visits and attendance to teacher's conferences, in comparison to parents in manual social class (Douglas 1964). In contrast, West et al. (1998) contend that mother's educational level may be a better predictor of involvement than social class, particularly defined by the father occupation.

Aims of the analysis

The two aims of this paper focus on the relationship between adolescent affect, characteristic of both anxiety and depression, and adult social integration. First, we test the relationship between two indicators of anxious and sad adolescent affect and indicators of adult social integration. We hypothesize that anxious and sad adolescent affect are both associated with affiliation with fewer social organizations, less frequent social participation, and the formation of smaller social networks. Second, we consider whether the association may be influenced by ascribed and achieved SES, as well as early social support and concurrent adult mental health. We posit that there may be long-term consequences of anxious or depressive adolescent affect that may adversely impact educational and occupational attainment and, in turn, adult earnings with consequent risk to self-perception and social integration. Following the leads of Durkheim (1954) and Merton (1968), we contend that less social integration in adulthood leaves individuals with more diffuse social networks, which ultimately may impact other social factors, such as access to social support, with implications for both mental and physical health.

Methods

Data

Participants were drawn from the MRC NSHD, a birth cohort study stratified by social class and initially consisting of 5,362 people selected from all births that occurred in England, Scotland, and Wales during one week in March 1946. Trained research nurses have gathered information about socio-demographic factors and social and psychological functioning by interview and examination. The current sample has been shown to be representative, in most respects, of the UK population legitimately and singly born in the immediate post-war era, with the exception an over-representation among those with lower social class and educational attainment (Wadsworth et al., 2003).

The sample size was reduced to 3,035 by mid-adulthood due to loss to follow up from the exclusions of deaths, persons living abroad or untraced, and permanent refusals. Of the participants interviewed at age 43 years, a sample consisting of 1,327 had completed data for the study variables of interest. The majority of the missing data was due to sample attrition by 43 years. We did not impute missing data for this analysis. No significant differences between those with completed data and those without were found and we have no evidence that casewise deletion will lead to bias in the parameter estimates (Allison, 2001).

Study variables

Adult social integration was represented by three ordinal measures at age 43: number of social affiliations, frequency of social participation and size of social networks. *Number of social affiliations* refers to the summed total number of social organizations and activities representing multiple life domains (e.g., church, local government, trade unions, volunteering). This measure was recoded into the following categories to improve the distribution: none, one, and two or more organizations. *Frequency of social participation* was indicated by whether respondents engaged in active participation weekly, monthly, less often, or never, ranging from 0 to 3. The responses associated with each organization or activity was dichotomized, summed, and recoded into three categories: never, monthly or less, and weekly. To assess *social network size*, respondents were asked to indicate how many friends or relatives they meet and talk to on a regular basis. This item had six response categories: none, 1-2, 3-5, 6-10, 11-15, more than 15. The average size was between 6 to 10 social network members. This item was recoded into the following categories: none, 1-5, 6-10, and 11 or more members to improve distribution.

Two separate measures of adolescent affect, collected at ages 13 and 15 years, were based on teacher's observations of each cohort member during their school years. For *anxious affect*, teachers were asked to best characterize the student as 'not at all anxious, apprehensive or fearful,' 'somewhat anxious, apprehensive, or fearful,' or 'very anxious, apprehensive or fearful.' *Sad affect*, was based on teachers' observations of the adolescent as 'usually happy and contented,' 'generally cheerful and in good humour, or 'usually sad or gloomy.' Both items are recoded into never being assessed as either anxious or sad at either 13 or 15 years versus being assessed as anxious or sad at either or both time points.

Background variables—*Mother's and father's educational attainment* were recoded from the original response categories (primary school only, secondary school only, and qualifications/degree) into two categories, qualifications/degree versus none, to correct for relatively small numbers in categories that differentiated types and levels of qualifications.

Parental participation in schooling, a measure of early social support was indicated by an index of parental interest and instrumental participation in the child's education (e.g. visiting teachers and headmasters for conferences, attending parent teacher association meetings) during primary school that was derived from interviews with mothers and from information from school records (Douglas, 1964). Scores ranged from 0 to 50 with a high score indicating more participation in the child's academic performance. Our preliminary descriptive analysis showed no association between parental participation in schooling and father's social class (few mothers were employed) for the sample included in this analysis, but parental participation was related to mother's education ($r=0.32$; $p<0.001$).

Adult socio-economic status—Educational attainment referred to the level of qualifications and their training equivalents attained by 26 years, and was defined as none, vocational only, ordinary secondary (O levels), advanced secondary (A levels), or higher degree level or equivalent. *Social class* at age 36 was classified according to the UK Registrar General. To improve distribution the non-manual classifications I and II were combined and the manual classification V and VI were combined, resulting in four categories: professional/managerial, skilled non-manual, skilled manual and unskilled/semi-skilled manual. *Total net household income* at 43 years was collected as an ordinal variable starting with the category less than £2000 pounds annually to greater than/equal to £50000 annually. This item was recoded into the following categories: 1= $\leq$ £5999, 2= $\leq$ £6000 to 10999, 3= $\leq$ £11000 to 15999, 4= $\leq$ £16000 to 20999, 5= $\geq$ £21000 All amounts refer to the earned income, state benefits, and any other sources of income such as pensions and interest by all household members.

Other covariates—Mental health. Trained nurses captured mental health at age 43 years by administering the Psychiatric Symptom Frequency (PSF) scale containing a 19-item scale measuring current and recent (past 12 months) symptoms of depression and anxiety (Rodgers, 1996). Scores range from 0 to 95. A total score for all items is calculated for the present study and this measure was subjected to log transformation to improve the distribution. *Gender* was entered as a dichotomous variable and controlled for in each model. Males and females account for 51.9 percent and 48.1 percent of the sample, respectively.

Table 1 presents the descriptive statistics for all study variables. The frequency distributions and percentages are reported for all categorical variables and means and standard deviations for continuous variables.

Statistical analysis

The first stage of the analysis involved examining the bivariate associations between all study variables. Variables failing to reach significance at the 5% level (e.g., father's social class, partner status, and having children) were excluded from the multivariate analysis to improve model specification. The strength of the association between anxious and sad affect, as indicated by the Pearson correlation coefficient ($r=0.09$; $p<0.001$) indicated that multicollinearity was not likely and supported our decision to consider the indicators as separate items.

Because the dependent variables were ordinal, we conducted a series of ordered logistic regressions in the second, and final, stage of the analysis. First, we tested for the effect of the two main explanatory variables, anxious and sad adolescent affect, on the three social integration outcomes, controlling for gender and independent of each other (Model 1). Model 2 was further adjusted for both mothers and father's education and parental social support in schooling. Model 3 involved further adjustment for educational attainment, social

class, and household income, and finally, we controlled for mental health at 43 years in the fully adjusted model (Model 4). The log odds resulting from the ordinal logistic regression referred to increased or reduced likelihood of being in the highest category of the dependent variable in comparison to the reference category.

Initial tests for possible gender differences in the effect of either adolescent anxious or sad affect on the outcomes failed to support a gender stratified analysis, i.e., neither of the interaction terms were significant at the 5% level.

Results

Adolescent affect and social integration

Table 2 shows the associations between anxious and sad affect in adolescence and number of social affiliations at age 43. In the first column, Model 1 shows no association between anxious or sad adolescent affect and the number of affiliations with social organizations and activities, controlling for gender. In Model 2, anxious affect decreases the odds of being among those in the highest category of social affiliations (2 or more). In contrast, sad affect is not associated with number of social affiliations.

There is no benefit to having parents with qualifications, in terms of number of social affiliations. In contrast, parental participation in schooling slightly increases the odds of being among those who become more socially involved as adults. The change in the significance of anxious affect from Model 1 to Model 2 may signify an indirect path through the resources made available through parents' education and parental participation in schooling, but no direct measure is available to test this assumption.

Additional adjustment in Model 3 for educational attainment, social class, and household income fails to attenuate the relationship between anxious affect and number of social affiliations. However, with each level of educational attainment beyond the vocational level, there is evidence of an upward gradient in increasing the odds of reporting the greatest number of social affiliations (in comparison to having no qualifications). For social class, only being professional and managerial non-manual level ($\exp(0.45) = 1.57$; $p=0.02$) increases the likelihood of being among those who reported the greatest number of affiliations in comparison to the manual social class (level V and VI). Household income and parents' education are not associated with social participation in this model, but parental participation in schooling remains an indicator of increased likelihood of adult social participation.

Finally, controlling for mental health at 43 years fails to attenuate the association between anxious affect in adolescence and adult social participation or be associated with the outcome. The influence of the parental participation, educational attainment, and being in the highest social class position continues in the fully adjusted model.

In Table 3, both anxious and sad affect in adolescence are associated with the frequency of social participation (Model 1). The addition of parent's education and parental participation in schooling only slightly diminishes the strength of these associations in Model 2. Father's educational qualifications decrease the odds of being among those who reported the greatest frequency of adult social participation, while parental participation in schooling slightly increases the likelihood of being among those with the greatest frequency of social activity. With the introduction of educational attainment, social class, and household income in Model 3, anxious affect, father's education, and parent's participation in schooling are no longer significantly associated with frequency of social participation. Educational attainment appears to mediate the effect of the background variables. Similar to the association of

education and number of social affiliations, there is a gradient effect, with each level of education above the vocational level increasing the likelihood of being among those with the most frequent adult social participation. Neither household income nor social class are associated with this outcome. Sad affect continues to have a negative, but weaker, impact on the frequency of adult social participation. The addition of adult mental health in Model 4 does not attenuate this relationship or the impact of educational attainment.

In Table 4, being assessed as anxious or sad results in reduction in the odds (approximately 30 percent ($\exp(-0.35) = 0.70$; $p < .01$) and 47 percent ($\exp(-0.63) = 0.53$; $p < .01$), respectively) of being among those who reported having the largest adult social networks. The strength of the main association remains relatively stable, even after further adjustment for mental health at 43 years.

In model 2, parental participation in schooling has a slight influence on being among those reporting the largest adult social network. This small effect became non-significant with the introduction of educational attainment, social class, and household income in Model 3. Adult socio-economic status has only a small effect on the main associations of interest. However, being in the highest income group, in comparison to the lowest income group increases the odds of being among those with the largest social network by 45 percent ($\exp(0.39) = 1.45$; $p = 0.04$). Greater number of adult symptoms of depression and anxiety is associated with smaller adult social networks (Model 4), but concurrent mental health fails to attenuate the associations between anxious or sad affect in adolescence and adult social network size.

Finally, testing separate models for anxious and sad affect did not alter the results, and supports our decision to show the effect of anxious and sad affect, independent of each other, in all multivariate models.

Discussion

Using data from a population-based birth cohort, we were able to consolidate strands of our understanding about the relationships between anxious and sad affect in adolescence, and social integration in a life course model. Our results add to the literature on sociological perspectives on mental health and social integration by showing that, for the most part, anxious and sad affect during adolescence was strongly associated with adverse adult social outcomes. This relationship generally persisted when indicators of socio-economic status, both acquired and achieved over the life course, and adult mental health were introduced into the regression models. Unexpectedly, we found divergent effects of the two separate, but theoretically overlapping measures of adolescent affect on adult social integration. The results suggested that, while anxiety and sadness in adolescence were both predictive of smaller network size, being assessed as anxious was predictive of fewer social affiliations, whereas sad affect was associated with less frequent social participation.

In terms of the sociology of mental health literature, this study was distinct from past studies that focused on the influences of socio-economic status on mental health and social integration; in that we were able to include early life mental health measures in combination with prospective, life course data. These findings provided some evidence pertinent to the classic dilemma of whether relationships between social integration and mental health support the social causation or social selection perspective (Dohrenwend et al., 1992; Turner and Turner, 1999). That is, does low social integration result in poor mental health (i.e., social causation) or does poor mental health limit the likelihood that an individual will seek out membership in activities and organizations, as well as maintain relationships within social networks (i.e., social selection)? These data highlight the influence of the latter. The

effect of adolescence affect on adult social integration suggests that anxious and sad affect may manifest socially in adulthood as a lack of engagement in social organizations and activities. However, understanding whether there were actual differential effects between anxious and sad adolescent affect on adult social integration, or the findings were due to chance, will require future investigations of this nature in other longitudinal studies.

With this in mind, additional results of our study deserve further consideration. The independent impact of parental participation in schooling on number of social affiliations may represent an enduring model of social behaviour and level of social interaction. However, the results suggest that the influence of early social support through parental participation in schooling on frequency of social participation in adulthood was attenuated by the resources associated with adult socio-economic status.

There was evidence of a more proximal effect of adult mental health only for social network size; the combined measure of anxiety and depression was associated with having the smallest social networks. However, the long-term effects of sad affect were independent of adult mental health, and the consequences of this were most likely for social processes that hindered frequency of social participation, embeddedness within networks, with potential implications for decreased access to network benefits, such as social support. The minimal influence of adult mental health suggests support for adolescence being a sensitive period for the influence of mental health on social outcomes with lasting consequences for social development and functioning. Recent evidence from this cohort showed that these teacher's assessments in adolescence were predictive of adult anxiety and depression at age 36 (Colman et al., 2007).

Because socio-economic statuses strongly influence mental health and social integration (Turner and Turner, 1999), we expected educational attainment, social class, and income heavily to influence the main associations through resources or social opportunities associated with socio-economic status. Unexpectedly, we found that most levels of resources potentially gained through occupying higher status positions had no notable influence on the association between sad or anxious adolescent affect and adult social integration. Educational attainment was an exception; this mediated the relationship between anxious affect and frequency of social participation and independently influenced the number of social affiliations and frequency of social participation.

Adult social class was not independently associated with frequency of social participation or social network size. The only significant association was between the highest social class group (professional and managers) and number of social affiliations, offering support for the suggested decline of intermediary social class differences in social participation and social networks (Li et al., 2003). In addition, the highest income level, in comparison to the lowest, was associated with social network size. However, none of the intermediary income categories were significantly associated with social network size.

We should note potential limitations of this study. First, information was not available on the qualitative aspects (e.g., depth and length of involvement) of affiliations with social organizations. Also, frequency of involvement in organizations like trade unions may be limited by available opportunities for participation. Second, we had no available information about strength or intensity of social network ties for this analysis. Third, bias in the teacher's observations is an obvious methodological issue. The possibility remains that the observations were influenced by unmeasured factors, such as teacher's expectations, the nature of the child-teacher relationship, school environment, and the impact of these labels on social interactions with the teachers or peers. Finally, there was a disproportionate loss to follow-up among those in the lowest social class and educational attainment. This may have

lead to an underestimation of the effect of adolescent affect on those more likely to be socially isolated or anomic in adulthood. However, based on our analysis comparing those with complete data versus those with missing data, we have no reason to believe this to be the case.

Despite these disadvantages, these data allowed us to consider the contribution of affect observed by teachers in the most common context for adolescent social interactions, beyond the family, on adult social experiences. Previous studies on this cohort reported summary scores of teacher assessments in relationship to adult mental health (Rodgers 1994; 1996; Van Os and Jones 1999, Van Os et al., 1997), but the findings from this study encourage the separation of anxiety and depression in future research. Greater specification of mental health symptoms, such as those related to anxiety and depression, may be particularly useful in gaining a better understanding of social processes that lead some individuals to more beneficial social ties, while others become more socially isolated or excluded. Future research with detailed longitudinal data, such as these birth cohort data, should seek to identify sensitive periods over the life course when the effect of other psychosocial variables are likely to lessen social isolation and promote social integration. The question remains whether or not levels of social integration are relatively stable over time. Addressing queries related to these findings requires further detailed characterization of social relationships with family members and peers developing during childhood and adolescence and into early adulthood. In addition to mental health, potential confounders, such as poor physical health or history of illness during childhood and adolescence that may limit the development of social ties outside of the family, social involvement, and participation in social organizations should be considered.

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Biography

Dr. Stephani L. Hatch is a sociologist with postdoctoral training in psychiatric epidemiology, and recently joined the Department of Psychological Medicine at the Institute of Psychiatry, Kings College London. Her interests include the impact of social statuses and cumulative adversity on mental and physical health. Recent publications include Stephani L. Hatch, Jones, PB, Kuh, D, Hardy, R, Wadsworth, MEJ & Richards, M. Childhood cognitive ability and adult mental health in the British 1946 birth cohort. *Social Science & Medicine*, *in press*.

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Table 1

Descriptive statistics for study variables (N=1338)

Study Variables	Percent (N)	Study Variables	Percent (N)
Adolescent Affect at age 13 and 15		Social class at 43 years	
Anxious	37.6 (503)	Professional and managerial occupations (I-II)	45.7 (611)
Never	62.4 (835)	Non-manual skilled occupations (III)	23.0 (308)
Either/both		Manual skilled occupations (IV)	17.4 (233)
		Partly-skilled and unskilled occupations (V-VI)	13.9 (186)
Sad		Number of social affiliations at age 43	39.7 (531)
Never	94.5 (1265)	None	31.6 (423)
Either/both	5.5 (73)	One	28.7 (384)
		Two or more	
Gender		Frequency of social participation at age 43	
Female	48.1 (643)	Never	12.5 (167)
Male	51.9 (695)	Monthly or less	57.8 (774)
		Weekly	29.7 (397)
Mother's education		Social network size at 43 years	
No qualifications	75.7 (1005)	None	2.1 (28)
Qualifications	24.3 (322)	1-5 members	26.0 (348)
		6-10 members	32.4 (433)
		11 or more	39.5 (529)
Father's education		Household income at 43 years (per year)	
No qualifications	70.3 (941)	Less than or equal to £5999	9.2 (123)
Qualifications	29.7 (397)	£6000 to 10999	10.3 (138)
		£11000 to 15999	12.5 (167)
		£16000 to 20999	17.0 (227)
		Greater than or equal to £21000	51.0 (683)
Educational attainment			
No qualifications	35.1 (470)		<u>Mean (SD)</u>
Vocational only	7.9 (106)	Parental participation in schooling	32.20 (13.89)
Ordinary ('O' level)	21.0 (281)		
Advanced ('A' level)	25.3 (338)	Mental health at age 43	10.77 (11.04)
Higher	10.7 (143)		

Table 2

Ordered logistic regression coefficients (log odds) and 95% confidence intervals (CIs) of the effect of adolescent affect on number of social affiliations at 43 years (N=1338)

Independent Variables	Model 1	Model 2	Model 3	Model 4
	B (95% CI)	B (95% CI)	B (95% CI)	B (95% CI)
Gender (Female= reference)	-0.31 (-0.51, -0.11) **	-0.32 (-0.52, -0.12) **	-0.13 (-0.37, 0.10)	-0.14 (-0.37, 0.10)
Adolescent affect				
Anxious	-0.19 (-0.40, 0.01)	-0.24 (-0.45, -0.03) *	-0.21 (-0.43, -0.01) *	-0.21 (-0.43, -0.01) *
Sad	-0.35 (-0.79, -0.10)	-0.25 (-0.71, -0.20)	-0.06 (-0.52, 0.41)	-0.06 (-0.53, 0.41)
Mother's education (qualifications=1)		-0.33 (-0.60, -0.07) *	-0.16 (-0.43, 0.11)	-0.16 (-0.43, 0.11)
Father's education (qualifications=1)		-0.49 (-0.73, -0.24) ***	-0.22 (-0.49, 0.04)	-0.22 (-0.48, 0.04)
Early social support				
Parental participation in schooling		0.02 (0.01, 0.03) ***	0.01 (0.00, 0.02) *	0.01 (0.00, 0.02) *
Educational attainment by age 26				
No qualifications (reference)			0	0
Vocational only			0.22 (-0.19, 0.63)	0.22 (-0.19, 0.63)
Ordinary ('O' level)			0.76 (0.46, 1.07) ***	0.77 (0.46, 1.07) ***
Advanced ('A' level)			0.83 (0.51, 1.15) ***	0.83 (0.51, 1.15) ***
Higher			0.99 (0.55, 1.45) ***	0.99 (0.55, 1.45) ***
Social class at age 43				
Partly-skilled and unskilled occupations (V-VI) (reference)			0	0
Manual skilled occupations (IV)			0.25 (-0.14, 0.65)	0.25 (-0.14, 0.65)
Non-manual skilled occupations (III)			0.12 (-0.25, 0.50)	0.12 (-0.25, 0.50)
Professional and Managerial occupations (I-II)			0.45 (0.07, 0.82) *	0.44 (0.07, 0.82) *
Household income at age 43				
≤£5999 (reference)			0	0
£6000 to 10999			0.04 (-0.33, 0.26)	0.04 (-0.33, 0.25)
£11000 to 15999			-0.28 (-0.05, 0.62)	-0.28 (-0.05, 0.62)
£16000 to 20999			0.22 (-0.59, 0.15)	0.22 (-0.59, 0.15)
≥£21000			0.33 (-0.73, 0.07)	0.33 (-0.73, 0.07)
Mental health at 43 years				0.01 (-0.09, 0.10)

* p<.05;

** p<.01;

*** p<.001

Table 3

Ordered logistic regression coefficients (log odds) and 95% confidence intervals (CIs) of the effect of adolescent affect on frequency of social participation at 43 years (N=1338)

Independent Variables	Model 1	Model 2	Model 3	Model 4
	B (95% CI)	B (95% CI)	B (95% CI)	B (95% CI)
Gender (Female= reference)	-0.31 (-0.53, -0.10) **	-0.31 (-0.52, -0.09) **	-0.18 (-0.42, 0.07)	-0.17 (-0.41, 0.08)
<i>Adolescent Affect</i>				
Anxious	-0.23 (-0.45, -0.01) *	-0.26 (-0.48, -0.04) *	-0.22 (-0.44, 0.09)	-0.22 (-0.44, 0.01)
Sad	-0.70 (-1.17, -0.23) **	-0.64 (-1.11, -0.17) **	-0.51 (-0.99, -0.03) *	-0.51 (-0.99, -0.02) *
Mother's education (qualifications=1)		-0.27 (-0.55, 0.09)	-0.17 (-0.46, 0.12)	-0.17 (-0.46, 0.11)
Father's education (qualifications=1)		-0.28 (-0.55, -0.02) *	-0.10 (-0.36, 0.16)	-0.10 (-0.37, 0.18)
Early social support				
Parental participation in schooling		0.01 (0.01, 0.02) **	-0.09 (-0.37, 0.18)	0.01 (-0.002, 0.02)
Educational attainment				
No qualifications (reference)			0	0
Vocational only			-0.02 (-0.45, 0.41)	-0.02 (-0.45, 0.41)
Ordinary ('O' level)			0.39 (0.07, 0.71) *	0.39 (0.06, 0.71) *
Advanced ('A' level)			0.46 (0.12, 0.80) **	0.46 (0.12, 0.80) **
Higher			0.75 (0.28, 1.22) **	0.75 (0.28, 1.22) **
Social class				
Partly-skilled and unskilled occupations (V-VI) (reference)			0	0
Manual skilled occupations (IV)			0.31 (-0.09, 0.72)	0.31 (-0.09, 0.72)
Non-manual skilled occupations (III)			0.21 (-0.18, 0.60)	0.22 (-0.17, 0.60)
Professional and Managerial occupations (I-II)			0.25 (-0.15, 0.64)	0.25 (-0.14, 0.64)
Household income at age 43				
<=£5999 (reference)			0	0
£6000 to 10999			0.17 (-0.47, 0.14)	0.16 (-0.47, 0.14)
£11000 to 15999			0.10 (-0.46, 0.26)	0.10 (-0.46, 0.26)
£16000 to 20999			0.05 (-0.43, 0.33)	0.05 (-0.43, 0.34)
>= £21000			0.40 (-0.81, 0.01)	0.39 (-0.80, 0.02)
Mental health at 43 years				-0.03 (-0.13, 0.07)

*
p<.05;

**
p<.01;

p<.001

Table 4

Ordered logistic regression coefficients (log odds) and 95% confidence intervals (CIs) of the effect of adolescent affect on social network size at 43 years (N=1338)

Independent Variables	Model 1	Model 2	Model 3	Model 4
	B (95% CI)	B (95% CI)	B (95% CI)	B (95% CI)
Gender (Female= reference)	-0.34 (-0.54, -0.14) **	-0.34 (-0.54, -0.14) **	-0.25 (-0.48, -0.02) *	-0.20 (-0.43, 0.03)
<i>Adolescent Affect</i>				
Anxious	-0.35 (-0.55, -0.14) **	-0.35 (-0.56, -0.14) **	-0.36 (-0.57, -0.15) **	-0.36 (-0.57, -0.15) **
Sad	-0.63 (-1.07, -0.19) **	-0.60 (-1.04, -0.16) **	-0.56 (-0.99, -0.11) *	-0.53 (-0.98, -0.09) *
Mother's education (qualifications=1)				
		-0.11 (-0.37, 0.16)	-0.09 (-0.36, 0.19)	-0.10 (-0.36, 0.17)
Father's education (qualifications=1)		-0.14 (-0.38, 0.11)	-0.10 (-0.36, 0.16)	-0.11 (-0.36, 0.15)
Early social support		0.01 (0.01, 0.02) *	0.01 (-0.00, 0.01)	0.01 (-0.004, 0.01)
Parental participation in schooling				
Educational attainment				
No qualifications (reference)			0	0
Vocational only			0.19 (-0.20, 0.59)	0.19 (-0.21, 0.58)
Ordinary ('O' level)			0.16 (-0.14, 0.46)	0.15 (-0.15, 0.45)
Advanced ('A' level)			0.27 (-0.05, 0.58)	0.27 (-0.05, 0.58)
Higher			-0.03 (-0.47, 0.42)	-0.003 (-0.44, 0.44)
Social class				
Partly-skilled and unskilled occupations (V-VI) (reference)			0	0
Manual skilled occupations (IV)			0.36 (-0.02, 0.73)	0.35 (-0.03, 0.72)
Non-manual skilled occupations (III)			0.09 (-0.27, 0.44)	0.10 (-0.25, 0.46)
Professional and Managerial occupations (I-II)			0.15 (-0.21, 0.51)	0.17 (-0.19, 0.53)
Household income at age 43				
<=£5999 (reference)			0	0
£6000 to 10999			0.03 (-0.32, 0.25)	0.03 (-0.31, 0.26)
£11000 to 15999			0.26 (-0.59, 0.07)	0.26 (-0.59, 0.07)
£16000 to 20999			0.20 (-0.56, 0.16)	0.18 (-0.54, 0.17)
>= £21000			0.39 (-0.77, -0.01) *	0.35 (-0.73, -0.03)
Mental health at 43 years				-0.13 (-0.23, -0.04) **

*
p<.05;

**
p<.01;

p<.001