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Emotional Health in Adolescents With and Without a History of Specific Language Impairment (SLI)

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Abstract

Objective: This study examined the emotional health of adolescents with and without specific language impairment (SLI). Method: 139 adolescents with a history of SLI (15;10 years) and a peer group of 124 adolescents with normal language development (NLD) (15;11 years) participated, who were in their final year of compulsory schooling. The risk of emotional difficulties was assessed using the Moods and Feelings Questionnaire (MFQ) and the Child Manifest Anxiety Scale-R (CMAS-R). Comprehensive language and cognition data were available for all participants (NLD and SLI) concurrently and also longitudinally for those with SLI. Results: A clear increased risk of emotional health symptoms was found for the SLI group on both self- and parental-report. Girls scored less favourably than boys when groups were combined, but these were due to the effect of the NLD group, with no gender differences found in the SLI group. Direct links with language and cognition were not obvious. Instead more diffuse factors such as family history of emotional health difficulties may warrant further investigation. Conclusion: There is a marked higher rate of anxiety and depression symptoms in adolescents with SLI. However these do not appear to be a direct *result* of impoverished communicative experiences.

Keywords: emotional health, adolescents, specific language impairment (SLI)

Emotional Health in adolescents With and Without a History of Specific Language Impairment (SLI)

Specific language impairment (SLI) is a developmental communication disorder in which language develops atypically without identifiable cause such as low general intelligence, neurological damage, hearing impairment or autism. Whilst SLI used to be thought of as a largely early years disorder, there is now mounting evidence that the language difficulties can persist into adulthood (Clegg et al., 2005). For about half the children with language difficulties at 5 years of age, continuing lifelong impairment appears to be a reality, and furthermore, as these individuals develop, the challenges widen to include areas of difficulty that are not directly concerned with communication skills. Despite being a relatively common disorder affecting 5-7% of the population (Tomblin et al., 1997), its status as a childhood disorder means that unlike acquired adult disorders of language, SLI has been under-investigated in terms of quality of life or psychiatric outcomes beyond the early years.

There have been notable exceptions (Cantwell & Baker, 1987; Beitchman et al., 2001; Clegg et al., 2005). Beitchman and colleagues followed up a cohort of children with SLI from 5 to 19 years of age, whom they assessed for psychiatric comorbidity. They found at different stages that children with SLI were at greater risk of having attention deficit hyperactivity disorders (Beitchman et al., 1996) and later had higher rates of anxiety disorders (Beitchman et al., 2001), aggressive behaviour (Brownlie et al., 2004) and increased substance abuse (Beitchman et al., 2001). Clegg and colleagues (2005) followed a cohort of children from 4 years old to mid adulthood and found an increased risk of psychiatric impairment (compared to both peers and siblings), particularly concerning depression, social anxiety and

schizoform/personality disorders. Other studies have examined language in populations referred primarily for psychiatric difficulties. Cohen and colleagues (1998) for example, found a higher than expected rate of undiagnosed language impairment (40%) in their clinic sample. Indeed a review of 10 years of work in the area by Toppelberg and Shapiro (2000) also concluded that language impairment was often not picked up by Child and Adolescent Mental Health or community psychiatric teams. In contrast, however, it needs to be noted that a recent study (Snowling et al., 2006) did not identify an overall increased risk of emotional disorders in a mixed sample of adolescents with a preschool history of SLI which included a significant proportion of young people with resolved language problems since the age of 5.5 years. Nonetheless, when specific subgroups were examined further, those adolescents with persisting SLI, i.e. language difficulties beyond 5.5 years, were shown to have a higher risk of psychiatric morbidity in adolescence.

Thus, still relatively little is known about the long-term outcomes for children with SLI. In particular emotional health symptoms such as depression and anxiety have not been investigated as often as externalising difficulties such as those concerning social skill (Conti-Ramsden & Botting, 2004), anti-social behaviour (Ripley & Yuill, 2005) and hyperactivity (Cohen et al., 2000). This may be the case, at least partly, due to current evidence pointing to externalizing problems being more strongly predicted by SLI than internalizing difficulties (Toppelberg & Shapiro, 2000).

Internalising symptoms may have a number of causes, for example, they may be a direct result of living with a persistent language disorder or may be related to other factors, for example, positive family history of psychiatric difficulties (O'Connor et al., 2002). This study examines the risk of emotional health symptoms

in a large sample of children with SLI followed from 7 to 16 years of age, using both between group comparisons with age matched normal language development (NLD) peers and within group analyses of family history and the development of language and cognition. This sample of young people with SLI has been studied extensively across this 10 year period. Research at the 16 year old phase includes an examination of the quality of their friendships (Durkin & Conti-Ramsden, in press), their level of independence (Conti-Ramsden & Durkin, in press), their bullying experiences (Knox & Conti-Ramsden, in press), their educational outcomes at the end of compulsory secondary education (Conti-Ramsden, Durkin, Simkin & Knox, under review; Durkin, Simkin, Knox & Conti-Ramsden, under review); their social cognition (Botting & Conti-Ramsden, under review) as well as the concerns their parents have when their offspring are facing the transition to adulthood (Conti-Ramsden, Botting & Durkin, in press). Results of this body of work reveal remarkable heterogeneity in the outcomes of young people with SLI at 16 years with some adolescents performing very much like their NLD peers whilst others exhibiting considerable impairments in each of the areas examined so far.

The present study adds to this cumulative body of evidence by examining the emotional health symptoms of this group of young people, in particular their experience of anxiety and depression. Specifically, this investigation addresses the following questions:

a) Do adolescents with a history of SLI have more emotional health difficulties, i.e., anxiety and depression than NLD peers?
b) How do emotional health symptoms relate to concurrent language, literacy and cognition in each group?

c) Within the SLI group, which adolescents are most at risk for emotional health problems and why? Specifically, in what ways do anxiety and depression symptoms relate to: i) early language and cognition skills?; ii) Earlier emotional / behavioural status?

Method

Participants

Young people with SLI. 139 children with a history of SLI originally recruited at 7 years of age as part of a wider study (the Conti-Ramsden Manchester Language Study, Conti-Ramsden & Botting 1999; Conti-Ramsden, Crutchley & Botting, 1997) participated in this follow up stage in their final compulsory school year (the academic year in which they became 16 years of age). The original cohort of 242 children represented a random 50% sample of all children attending year 2 (age 7) in language units across England. Children reported by teachers to have frank neurological difficulties, diagnoses of autism, known hearing impairment or general learning impairments were excluded. All children had English as a first language, but 12% had exposure to languages other than English at home. In our original sample, 53.1% of the participants came from households earning less than the average family wage for that year and 46.9% of the participants came from households earning more than this threshold. The cohort has been followed up previously at 8 years of age (n=234), 11 years of age (n=200) and at 14 years of age (n=130). The 139 adolescents who agreed to participate at 16 years of age were not found to be different on any early variables of language, behaviour, cognition or SES compared to those who did not participate. The children showed a variety of different language profiles with the majority described as having both receptive and expressive difficulties.

NLD young people. A comparison group of adolescents from a broad background participated in the study. In total, 124 NLD young people were recruited aged between 15 years 2 months and 16 years 7 months (mean age 15;11 years). Census data as per 2001-2002 General Household Survey (UK Office of National Statistics) was consulted in order to target adolescents who would be representative of the range and distribution of households in England in terms of household income and maternal education. In post-hoc analysis, there was also no significant difference between NLD adolescents and adolescents with SLI in maternal education levels ($\chi^2(2,234)=1.756$, p=.416) or household income bands ($\chi^2(3,235)=4.391$, p=.222). They had no history of special educational needs or speech and language therapy provision.

At the time of the study, all adolescents were attending the last year of compulsory secondary education. There were no significant differences in the proportions of girls in each group (SLI=42/139; NLD=47/124; Fisher's exact p=0.20).

Table 1 presents the characteristics of the adolescents with SLI and NLD adolescents in terms of their age, current language and performance IQ (PIQ).

Table 1

Measures

Key measures.

Child Manifest Anxiety Scale (CMAS-R; Reynolds & Richman, 1978). This is a 28 item questionnaire designed to measure anxiety symptoms in children.

Both self report and parent report measures were used. Respondents are required to say whether statements are 'true' or 'not true' for the previous 3 months.

Short Form Moods and Feelings Questionnaire (MFQ; Costello & Angold, 1988). This is a 13 item questionnaire for depressed mood, designed for young people aged 8-18. Both self report and parent report measures were used. Respondents are required to say whether statements about their feelings were 'definitely true' 'somewhat true' or 'not true' over the previous 3 months.

Because of the comprehension difficulties of the SLI sample, items from both scales were read out loud and the options were also represented visually, e.g. '✓✓' '✓' or '✗'. Higher scores indicate higher levels of anxiety/depressed mood.

Family History Interview (FHI; Bolton et al., 1994) is an investigator-based interview schedule that elicits information on social and other psychiatric symptomatology in family members. Eight questions were selected from the interview for the purposes of the present analyses. These questions covered the presence of depression, bipolar affective disorder, anxious worrying and generalised anxiety disorder in both childhood and adulthood. Each coding is structured in terms of a definition that specifies the focus and scope of the item, together with criteria to set the severity threshold used for coding. In each case, there are one or more mandatory probes in order to provide a comparable orienting introduction to the item for the informant. However, the interviewer's task is to obtain a description of behaviour that is sufficiently precise for a decision to be made on whether or not the specified criteria for the item are met. Again, for the purposes of this study, positive coding of these descriptions for any of the above emotional health disorders were combined, resulting in two codes for each parent for each child: Firstly, a score for positive

history of ever having an emotional disorder; second, a score for having a positive history of having had an emotional disorder in childhood. Secondly, these scores were combined further across parents to create 'either- parent - ever' and 'either-parent-childhood' codes. 'Both parent' coding was considered, but numbers were too small for analysis.

Other measures.

Concurrent language and PIQ data were available for all the NLD adolescents at 16 years of age. For adolescents with SLI, concurrent language and PIQ data was available for 136/139 participants (2% missing data). For these 136 participants data were available at age 14 years for 92/136 (68%) and at 16 years for 44/136 (32%). For ease, no distinction will be made between these data for the adolescents with SLI and they will all be referred to as concurrent data.

Literacy data (basic reading and reading comprehension) were available for approximately half (n=69) of the NLD group and all but 5 of the SLI group. Literacy is therefore included in the correlational analyses to examine any obvious effect of attainment on emotional health, but is not entered into subsequent regression analyses. Further longitudinal language and cognition data was available for the SLI group only at various ages. The measures used in the present study were as follows:

16 years:

Clinical Evaluation of Language Function-Revised (CELF-R; Semel, Wiig & Secord, 1987) subtests: Recalling Sentences (expressive) is designed to assess recall and reproduction of surface structure as a function of syntactic complexity. The child is required to repeat sentences of increasing complexity given verbally by the tester. Word Classes (receptive) requires the child to identify two words that are related by

semantic class, opposites, spatial or temporal features from a list of four words read out by the examiner. Thus, receptive and expressive language skills were measured by single tasks which formed part of a longer assessment, i.e., CELF-R. These specific subtests were chosen as they are used widely in the literature and are considered good indicators of these skills (Conti-Ramsden, Botting, & Faragher, 2001; Gillon & Dodd, 2005; Stothard, Snowling, Bishop, Chipchase, & Kaplan, 1998). We were also mindful of the length of the sessions for the NLD participants. The adolescents with SLI did receive a full CELF-R assessment including all the subtests for both the expressive scale (Formulated Sentences, Recalling Sentences and Sentence Assembly) and the receptive scale (Oral Directions, Word Classes and Semantic Relationships). Given the availability of these data, we repeated the analyses involving the SLI group using the full CELF-R measures. The results reported below were unchanged. Thus, the paper reports findings involving the single subtests as these were the common measure across groups.

Wechsler Objective Reading Dimensions: basic reading subscale (WORD; Wechsler, 1993). Both word reading and reading comprehension subtests were administered.

WISC III (Wechsler, 1992):A full WISC III Performance IQ battery was completed.

11 years:

CELF recalling sentences (as above); Test for Reception of Grammar (TROG; Bishop, 1982) a well used test of sentence level receptive language skill. WISC subtests of Block design and Picture completion (Performance tasks) were also administered.

7 and 8 years:

Bus Story narrative assessment (Renfrew, 1991) – an expressive test of sentence level expression and memory.

Raven's Coloured Matrices (Raven, 1986) – a non-verbal IQ test.

Also at 7 and 8 years of age, teachers were asked to complete a Rutter behavioural scale (Rutter, 1967) for each child. This is a tick-box measure where 26 items are scored as '0 ' for never applies, '1' for applies somewhat and '2' for certainly applies. Items are summed to give a total score. Scores of 9 or more are considered to represent 'extreme' behaviour. This checklist was chosen to provide information about the child's general behavioural difficulties (both emotional and anti-social).

Analyses

The NLD group and SLI group were not significantly different on household income. Furthermore, whilst the NLD group was quota sampled to reflect the UK population in terms of SES distribution, fewer families from the lower income bands were recruited. Thus all analyses were repeated using a weighting variable based on the 2002 census information (UK national office of statistics). All such analyses produced identical pattern of results. Therefore analyses presented in the text are unweighted. Due to small numbers of missing data, total numbers for each assessment vary slightly and are indicated in the text or tables. Parametric analyses are used throughout. Statistical significance was set at $p<0.05$. Borderline trends are reported where $p=0.051$ to $p=0.1$. Bivariate Pearson's correlation coefficients are reported in correlational analyses. Cohen's d is used to represent effect size where 0.2 is small, 0.5 is medium and 0.8 is large. Nagelkerke r^2 is an estimation of variance for logistic regression which simulates the linear r^2 statistic.

Procedure

The young people were seen individually at school by a researcher and interviewed / tested in a quiet area. The parents of the young people were interviewed separately at home for a single period of about two hours. Ethical approval for the study was gained from the University of Manchester. Informed written consent was gained from the school and from both parents and the young people themselves.

Results

Question a) Do Adolescents with a History of SLI have More Emotional Health Symptoms, i.e., Anxiety and Depression than NLD Peers?

Anxiety. For the CMAS-R, scores between the SLI group and the NLD group were significantly different for self-report (mean=10.3, SD=6.1 vs. mean 7.0 , SD=4 respectively: $F(1,262) = 23.7$; $p<0.001$, Cohen's $d=0.6$) and parent report (mean=9.5, SD=6.5 vs. mean=5.4, SD=4.1 respectively : $F(1,249)=33.8$; $p<0.001$, Cohen's $d=0.8$) with the SLI group being reported as more anxious. The number of children scoring over the clinical thresholds (>19) on each version was also assessed. This analysis also revealed that more children with a history of SLI showed clinical level of emotional health symptoms using both self-report (16/139 vs. 3/124; Fisher's exact $p=0.004$) and parent report (15/135 vs. 1/116; Fisher's exact $p=0.001$).

Depression. For the MFQ a similar pattern was observed. Again, scores from the SLI group were significantly higher than those of the NLD group for self-report (mean=6.7, SD=5.5 vs. mean 3.7, SD=4.2, respectively: $F(1,262) = 20.5$; $p<0.001$, Cohen's $d=0.6$) and parent report (mean=5.5, SD=6.1 vs. mean=3.1, SD=3.8, respectively : $F(1,249)=14.9$; $p<0.001$, Cohen's $d=0.5$). The number of children scoring over the clinical thresholds (>7) on each version was again assessed and a

larger proportion of those with SLI were in this risk group using both self-report (54/139 vs. 17/124; Fisher's exact p<0.001) and parent report (37/136 vs. 13/118; Fisher's exact p=0.001).

Gender. When group x gender ANOVAs were performed on all scales, there were main effects of gender with small effect sizes (CMAS-R self report: F(1,259)=3.9,p=0.049, Cohen's *d* =0.2; CMAS-R parent report: F(1,247)=5.5, p=0.02, Cohen's *d*=0.2; MFQ self report: F(1,259)=5.4, p=0.02, Cohen's *d*=0.3; MFQ parent report: F(1,250)=4.9, p=0.03, Cohen's *d* =0.3) and groups (as reported above), but no significant interactions (CMAS-R self report: F(1,259)=0.1, p=0.7; CMAS-R parent report: F(1,247)=0.4, p=0.5; MFQ self report: F(1,259)=0.01, p=0.9; MFQ parent report: F(1,250)=0.3, p=0.6).

Despite this lack of statistical interaction, inspection of the means motivated carrying out analysis using separate simple ANOVAs. These revealed a different pattern of results for each group. For the SLI group no significant difference was found between girls and boys on any version of any scale (effect sizes all <0.25). For the NLD group significant gender differences (all with girls scoring less favourably) were found on the depression self-report questionnaire (MFQ self report: F(1,122)=4.1,p=0.046, Cohen's *d* =0.4) and a borderline difference on the anxiety self report measure (CMAS-R self report: F(1,122)=3.6,p=0.06, Cohen's *d*=0.3) as well as significant differences on both the parent report MFQ (F(1,116)=7.5,p=0.007, Cohen's *d*=0.5) and CMAS-R (F(1,114)=8.1, p=0.005, Cohen's *d*=0.5).

Nevertheless, all the analyses above comparing those with SLI and those with NLD remained unchanged after controlling for gender. Thus, gender does not appear to be a predictor but a moderator/interacting variable for the NLD group.

Question b) How do Emotional Health Symptoms Relate to Concurrent Language, literacy and Cognition in Each Group?

The next analyses examined the association between anxiety and depression and concurrent language and cognition skills, i.e. PIQ. Analyses were conducted initially with the SLI and NLD groups separately to explore whether different patterns of associations were evident.

In fact, as can be seen from table 2, the anxiety and depression scales showed almost no relationship to concurrent skills in either group. Furthermore, all the group comparisons in question a) above remained significant after adjusting for language and PIQ. In only one instance did the strength of correlation between measures differ across groups, and this was for PIQ and CMFQ scores.

Table 2

These findings were confirmed using regression analyses with both groups combined. Each self report scale in turn acted as the dependent variable. The regression was conducted using an enter command in three blocks, firstly PIQ and household income were entered as covariates, in the second step expressive and receptive language scores were entered, and in the third block, the group (NLD vs. SLI) variable was entered. For CMAS-R the model explained 12% of the variance (adj. R square=0.12). Group status was the only significant variables in the final model. For CMFQ, the model explained 10% of the variance (adj. R square=0.10) and again group status was the only significant variable in the final model. Regressions using parental report are not reported but showed the same pattern of results.

Question c) Within the SLI Group, Which Adolescents are Most at Risk for Emotional Health Symptoms and Why?

Earlier language and cognition. For the group with a history of SLI only, longitudinal data was available from previous stages of the study. Simple correlational analyses were again conducted this time with earlier language and cognition scores.

There were no significant associations between early language scores and emotional health (see table 3). There were also no associations between early cognition and emotional health (all correlations below .1).

Table 3

Earlier emotional/behavioural status. The relationship between earlier emotional/behavioural status and current emotional symptoms was also examined. Overall Rutter Questionnaire scores taken at 7 did not relate significantly to either CMAS-R (0.13) or CMFQ (0.08). However when the group was split into those with no clinical level difficulties, those with behavioural-type difficulties and those with emotional-type difficulties (using the original guidelines for this questionnaire), those with emotional difficulties scored significantly higher on the CMAS-R at 16 years (emotional:12.8 (sd=5.5); behavioural: 10.3 (sd=7.6); non-clinical: 9.4 (sd=5.7), $F(2,132)=3.6$, $p=0.03$). No differences were found between the Rutter Questionnaire groups on the depression scale (CMFQ: $F(2,132)=1.1$,$p=0.35$).

Positive parent history. For some of the children (n=72) information was available about their parents own experience of depression and anxiety as measured by the FHI. Rates of self-reported emotional health disorder in parents was higher than expected in the general population (e.g. major depressive disorder lifetime

prevalence is thought to be 15-25% for women, bipolar 1-2%, generalised anxiety disorder 5% ; DSM IV, APA, 1994). In total, 45/72 (63%) parents reported having ever had an emotional health disorder and of these 17/72 (24%) reported childhood experience of depressive, bipolar or anxiety disorders, suggesting that not all the prevalence can be easily explained as a reaction to rearing a child with a communication difficulty.

It was of interest to examine the profiles of parents who had and had not reported an emotional health difficulty in order to determine whether they were different in nonverbal, verbal and literacy abilities. Parents who reported never having an emotional health difficulty were not significantly different to those who reported ever having an emotional health difficulty on measures of WAIS-R nonverbal IQ (Never M (SD) = 114.2 (16.8); Ever M (SD) = 112.8 (18.4); $F(1,109)=.24$, $p=.626$), WAIS-R verbal IQ (Never M (SD) = 103.1; Ever M (SD) = 102.4(14.8); $F(1,109)=.17$, $p=.681$), WORD basic reading (Never M (SD) = 104.2 (10.7); Ever M (SD) = 104.1 (10.7); $F(1,109)=.26$, $p=.609$) or WORD spelling (Never M (SD) = 101.8 (15.6); Ever 100.0(17.4); $F(1,109)=.34$, $p= .564$). This pattern remained when considering the 'ever' versus 'childhood' groups. The number of parents with low abilities (>1SD below the mean) in each group was also examined for nonverbal IQ (never 3/71, 4.2%; ever 2/49, 4.1%), verbal IQ (never 6/71, 8.5%; ever 2/49, 4.1%), reading (never 1/71, 1.4%; 5/49, 10.2%) and spelling (never 11/71, 15.5%; ever 10/49, 20.4%). Small numbers prohibited statistical and further analyses of these data but visual inspection suggested that the distribution of impairment was not different between groups with the possible exception of reading.

We then examined how these prevalence rates associated with the anxiety and depression scores of the young people with SLI.

Anxiety. Of 16 children with high self report CMAS-R, 8 had parent data available and 6/8 had positive family history of emotional health disorder (4 with both parents reporting disorders; 3 reporting childhood disorders). Although this rate is very high at (75%), the rate in the non-anxious children with SLI was also very high 39/64 (61%) and no significant difference was found using Chi-square analyses. Whilst parents experiencing childhood disorders were nearly twice as frequent in the high anxiety group (3/8; 38%) compared with the non-anxiety group, (14/64; 22%) this difference did not reach statistical significance. No significant difference was found for anxiety scores between those young people with and without positive family histories using ANOVA.

Depression. A similar pattern was seen for depression scores in the young people. Of 54 with high self report MFQ scores, 28 had parent data available and 19/28 reported a positive family history of emotional health disorder (7 with both parents reporting disorders; 10 with parents reporting childhood history). Again the overall rate of reported emotional health problems was high at 68% and although they appeared higher than the rates in young people who did not score not above the MFQ cut-off (26/44; 59%) the difference was not statistically significant. However, the group with high CMFQ scores had more than double the prevalence of parents reporting childhood disorders(10/28 or 36%) compared with the low depression score group (7/44 or 16%) and this reached borderline statistical significance (Fisher's exact p=0.086). Once more, no significant difference was found for depression scores between those young people with and without positive family histories using ANOVA.

Who is most at risk of emotional difficulties? Because all but 2 of the young people with high anxiety scores also had high depression scores, the self report depression scores were used to conduct two regression analyses: One linear regression with CMFQ score as the dependent variable (DV); and one logistic regression with high CMFQ scores vs. normal range CMFQ scores as the binary DV. For both analyses, only items found to have a significant relationship to anxiety or depression in the SLI group, using univariate analyses above were entered. These were: CELF receptive score at 16 and Rutter Questionnaire group (non clinical; emotional; behavioural) at 7 years. Variables were added using an enter command in two steps: Rutter questionnaire, then CELF WC at 16. For the linear analysis, CELF receptive subtest was significant and the model was also significant explaining 25% of the variance ($F(2, 128)=4.22$, $p=0.017$). For the logistic analysis, exactly the same procedure was employed only with the binary DV. On this occasion, neither variable nor the final model were significant explaining only approximately 3% of the variance (Nagelkerke adj. r square=0.031; $\chi^2(2)=3.01$, $p=0.222$).

Discussion

The results of the present investigation raise a number of key issues which relate to the risk of emotional health symptoms in young people with a history of SLI. Firstly, our data show a clear increased risk for this population as they near adulthood compared to peers, even when concurrent language and cognition are accounted for. This finding replicates other studies that have shown raised prevalence of psychiatric difficulties in those with communication impairments (e.g., Clegg et al., 2005) or increased language impairment in children referred psychiatrically (e.g., Cohen et al., 1998) and reviews affirming the association (Toppelberg & Shapiro, 2000).

Beitchman and colleagues (2001) in particular found anxiety increased in a similar cohort with SLI at 19 years of age. However, the association has often been assumed to be causal in that either long-term language impairment may lead to (or exacerbate) wider difficulties, or that psychiatric impairment may constrain communication skill. Furthermore, our data suggests that the typical gender bias protecting boys from emotional disorders is 'washed out' by the clinical nature of the SLI group. Thus, increased risk of emotional health symptoms appears to affect males and females relatively equally in SLI. Thus gender may not be a predictor in this sample, but maybe an interacting or moderating factor when the wider population of adolescents is considered. Although SLI is a disorder with a greater male prevalence, in this sample the NLD group was matched for gender. As such, this is an interesting finding worthy of further study over longer time periods and may point to a different set of risk factors not identified here.

The second issue raised by the present study is that apart from the fact that those with SLI have increased symptoms, surprisingly few clear associations exist between language and the development of emotional health symptoms. This is similar to the findings of Clegg and colleagues (2005) who also failed to find a clear relationship between the two. In this study, however, there did appear to be some relationship between concurrent receptive language and emotional health difficulties (for the SLI group only). This was only true in a linear way, and did not significantly predict those with very poor emotional health scores. Furthermore, the correlations whilst significant explain a relatively small proportion of the emotion questionnaire scores. Literacy difficulties were also unrelated, ruling out academic attainment as a potential direct cause.

The lack of association between early language scores also make it more difficult to interpret the relationship between having poor language and emotional health difficulties as a directly developmentally causal one: that is having ongoing poor communicative experiences does not appear to 'make you' increasingly depressed or anxious per se. Rather, this association with SLI is consistent with a more diffuse causal model in which atypical development at very early stages of life can lead to a number of different, but not immediately causally related, impairments which are latent until later in life (e.g., Barker et al., 1995). Supporting this interpretation is the finding that those with 'emotional' problems at 7 years of age also show increased anxiety at 16 years. At present other factors involved in this atypical development are not particularly clear for SLI. Cohen and colleagues (2000) examined groups with language impairment, psychiatric disorder or both and showed that specific cognitive difficulties were most marked in the last of these groups. Although our study found no association between non-verbal IQ (early and concurrent) and emotional health, specific cognitive difficulties have been linked with both language impairment (e.g., Ellis-Weismer et al., 1999) and with depression (e.g., Fossati et al., 1999), and more sensitive measures of cognitive skills may have revealed a connection. In addition, how young people see themselves, whether they have been able to compensate in some ways, the types of experiences they may have had, for example, whether or not they have been bullied in school (Knox & Conti-Ramsden, in press), as well as the level of support they may have received at home and at school can all be considered to be some of the other potential contributory factors. Although involving young people with reading difficulties and not young people with SLI, the review put together by Maughan (1995) suggests that guidance and support at important transition points in the lives of young people may be

amongst the most important contributions that professionals can make to these individuals during adolescence.

Thirdly, the study has some limited and preliminary data on family context of emotional health disorder and there was a high reported prevalence of emotional health problems in parents of the SLI group (APA, 1994; DSM IV). Nevertheless, this did not relate to whether the target child in the family also obtained high emotional difficulty scores. There is a body of literature showing that having a child with a communication disability predicts higher rates of anxiety and depression (e.g., Veisson, 1999; Ollson & Hwang, 2001). However, a third of the parents reported childhood depression or anxiety, and these parents were more likely to have a young person with depression within this SLI sample suggesting a more inherent cause rather than a reactive disorder. Having said this, this association did not reach significance, and measures were retrospective. In the same vein, an examination of the psycholinguistic abilities of the parents themselves did not reveal any clear patterns of association between parents' own cognitive/language/literacy difficulties and their own history of emotional health problems. Furthermore, it needs to be considered that there may be an increased salience around emotional difficulties and the way in which young people respond to questionnaires may differ if parents have long-term experiences of emotional disorders. Thus this tentative link may also represent environmental factors rather than heredity. Within this context, we believe it is too early to draw clinical implications of these findings, i.e. calling for professionals involved with SLI to explore family histories of depression and anxiety. Nevertheless, we feel that these findings suggest that wider factors such as family experience of emotional health difficulties warrant further investigation for this population.

Clinical Implications

The study has clinical implications for those working in speech language therapy as well as those in psychiatry and general practice. In particular direction of causality cannot be assumed from either perspective - it does not appear that emotional health is associated with language impairment in a simple way. Thus, those working and living with individuals who have SLI should be aware of the associated emotional risks and have access to good quality support for this outcome. Furthermore, those receiving referrals within CAHMS and community medicine need to be aware of the possible association of emotional health and language disorder as this may inform assessment of developmental history, assessment of emotional disorder and the efficacy of any verbally mediated therapy.

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Table 1

Concurrent Participant Descriptives (Means and SDs)

	Age	PIQ	CELF Exp subtest	CELF Rec subtest
SLI	15;10 (0;5)	84.1 (18.8)	74.1 (11.0)	83.9 (16.9)
NLD	15;11 (0;4)	99.9 (15.8)	97.2 (15.0)	99.5 (13.2)

Table 2

Correlations Between Adolescent Language, Cognition(PIQ) and Literacy with Parent and Child Emotional Health Scales

	PCMAS-R	CMAS-R	PMFQ	CMFQ
	SLI group			
PIQ	-.006	.019	-.045^{+}	-.064
Celf exp	-.030	-.121	-.013	-.080
Celf rec	-.117	-.206*	-.099	-.171*
WORD Basic Reading	.019	.017	-.075	.007
WORD Read. Comp.	-.085	-.144	-.124	-.154
	NLD group			
PIQ	-.026	-.185*	<.001	-.121
Celf exp	.009	-.124	.010	-.011
Celf rec	.178	-.077	.144	-.090
WORD Basic Reading	.152	.045	-.043	.095
WORD Read. Comp.	-.003	-.117	-.024	-.055

* $p<0.05$

$^{+}$significantly different correlational strength between groups on corresponding value

Table 3

Associations Between Early Language and Emotional Health

	PCMAS-R	CMAS-R	PMFQ	CMFQ
Receptive Language				
TROG 7	-.013	-.052	-.009	-.111
TROG 8	-.014	-.012	-.002	-.104
TROG 11	-.074	-.029	-.071	-.078
Expressive language				
Bus 7	-.007	-.068	-.046	-.130
Bus 8	-.123	.011	.055	-.101
CELF rs 11	.003	-.121	-.011	-.058