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Profiles of need and provision for children with language impairments and autism spectrum disorders in mainstream schools: A prospective study

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This research report was commissioned before the new UK Government took office on 11 May 2010. As a result the content may not reflect current Government policy and may make reference to the Department for Children, Schools and Families (DCSF) which has now been replaced by the Department for Education (DfE).

The views expressed in this report are the authors' and do not necessarily reflect those of the Department for Education.

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EXECUTIVE SUMMARY

Background

The Better Communication Research Programme (BCRP) was commissioned as part of the Better Communication Action Plan[1], the government's response to the Bercow review of services for children and young people with speech, language and communication needs[2]. This had recommended a programme of research 'to enhance the evidence base and inform delivery of better outcomes for children and young people' (p.50). This is one of 10 publications reporting the results from individual BCRP projects. These contribute to a series of four thematic reports and the main report on the BCRP overall in which we integrate findings and present implications for practice, research and policy from the BCRP as a whole (see Appendix 1 for full details[3]).

Despite increasing research examining the cognitive and behavioural profiles of pupils with language impairments (LI) and autism spectrum disorders (ASD) relatively little is known about the needs of these pupils in mainstream classrooms, the ways in which their needs are met, or the extent to which the level of support provided is related to the severity of their language difficulties and/or social behaviour. The increased numbers of pupils identified as having ASD has also led to a consideration of the nature of provision required for pupils with LI and ASD. Two complementary BCRP reports analysed the national data set for pupils with speech language and communication needs (SLCN) and ASD and highlighted differences between these cohorts[4, 5]. These complementary reports focussed on a broad group of pupils with SLCN; nonetheless they form a backdrop for addressing questions relating to pupils with more specific language difficulties and ASD.

Here we report on a three year prospective study of pupils identified with LI or ASD as their primary special educational need (SEN). Our study was designed to explore their

[1] https://www.education.gov.uk/publications/eOrderingDownload/Better_Communication.pdf
[2] Bercow, J. (2008). *The Bercow Report: A review of services for children and young people (0-19) with speech, language and communication needs.* Nottingham: DCSF. https://www.education.gov.uk/publications/eOrderingDownload/Bercow-Report.pdf
[3] Reports are accessible through the DfE's research site http://www.education.gov.uk/researchandstatistics/research
[4] Meschi, E., Mickelwright, J., Vignoles, A., & Lindsay, G. (2012). *The transition between categories of special educational needs of pupils with speech, language and communication needs (SLCN) and autism spectrum disorder (ASD) as they progress through the education system.* London: DfE.
[5] Strand, S., & Lindsay, G. (2012). *Ethnic disproportionality in the identification of speech, language and communication needs (SLCN) and autism spectrum disorders (ASD)* London: DfE

characteristics and needs and the provision made to meet these needs within the education system. We focussed on three features of the pupils' development

1. Cohort differences and overlap in performance on measures of language, cognition, memory, literacy, autism features, quality of life, behaviour and school attainment
2. How schools addressed the pupils' needs
3. How parents understood their children's needs and the ways in which they were being addressed in school

What we have done

We used a diverse range of methodological approaches. We assessed language, cognition, memory, literacy, autism features, quality of life and behaviour in 162 pupils with LI (*n* = 88) and ASD (*n* = 64). In parallel we obtained data on attainment from the Department for Education and collected data from teachers on classroom support, from Special Educational Needs Co-ordinators (SENCOs) on resources provided to pupils, and from parents on their views. We also observed the pupils in an English language or literacy lesson.

In order to allow comparison with published data on clinically-ascertained samples of pupils with specific language impairment (SLI) and ASD we distinguished between pupils with average (or above) nonverbal ability and those with low nonverbal ability. Therefore, we identified four cohorts of participants: pupils with LI and average nonverbal ability (LI-av-NV), LI and below average nonverbal ability (LI-low-NV), ASD with average nonverbal ability (ASD-av-NV) and ASD with below average nonverbal ability (ASD-low-NV). Consideration of these four cohorts allowed our data to be informative about needs and provision for a group of pupils with SEN that reflects the range of pupils with SLCN and ASD found in mainstream primary and secondary schools.

The use of a cross-sequential design allowed us to examine cohort (LI-av-NV, LI-low-NV, ASD-av-NV and ASD-low-NV), longitudinal (over a period of two years) and cross-sectional (year group comparisons) effects across the measures collected. Results considered each of these comparisons as appropriate.

What we have found

Language learning needs

We assessed pupils on both composite language measures and measures which tapped subcomponents of the language system (phonology, vocabulary and grammar). Overall, pupils exhibited depressed language scores but pupils with ASD-av-NV performed consistently better that the other three cohorts. Correlations between expressive and

receptive language measures were larger for the ASD cohorts, possibly reflecting the greater range in their scores. Repeated measures were available for the tests examining vocabulary and grammar. Here we found stability over time. Across a number of language measures, it was also evident that pupils recruited in older year groups showed significantly poorer standardised scores than pupils recruited in younger year groups.

As well as administering direct assessments of structural language, we used a parent report questionnaire that provides information on pragmatic language i.e. the social use of language. In contrast to the pattern of results for structural language, pupils with ASD showed greater difficulties than their LI peers on pragmatic language dimensions. This is consistent with the communication difficulties highlighted in the ASD cohort by teachers and parents when they completed standardised questionnaires on autism symptomatology.

Cognition and memory

A standardised assessment of nonverbal ability was used to classify pupils into the four cohorts. We confirmed nonverbal ability status (average vs. low) using a second measure. We also demonstrated that for our sample (both LI and ASD cohorts), there was a significant differences between indices of verbal and nonverbal ability; pupils showed poorer scores on the verbal than nonverbal measure. Over time both low-NV cohorts showed a significant improvement on their *Z* scores. In contrast, scores for the ASD-av-NV decreased but those for the LI-av-NV remained stable. The most likely explanation is the statistical artefact at regression to the mean.

Performance was depressed on verbal and nonverbal measures of memory and performance was equivalent across these domains. There were few cohort differences of note on memory tasks. The ASD-av-NV cohort performed significantly better than the LI-av-NV cohort on the digit recall task (verbal short-term memory), and better than the ASD-low-NV cohort on the spatial recall task (nonverbal short-term memory). Otherwise there were no significant differences between the cohorts. Given that we found year group differences on some language measures, we anticipated that there may be differences between year groups on verbal memory measures. However, this hypothesis was not borne out.

Literacy

Performance across literacy measures indicated that in most cases pupils with LI showed a greater degree of difficulty than pupils with ASD. However, differences in cohort means

masked a degree of overlap in LI and ASD distributions. In longitudinal analyses, word recognition scores were stable but reading comprehension *Z scores* were lower at Time 2 than at Time 1. This effect was consistent across ASD and LI cohorts and indicates that reading comprehension difficulties were worsening over time in those pupils with language, social and communication difficulties and that they were falling further behind their peers. A discrepancy between reading skills was evident in the ASD cohort at both Time 1 and Time 2, reading comprehension was relatively more impaired than word recognition. This discrepancy was also evident in the LI cohort at Time 1 but not Time 2. Writing fluency scores were particularly depressed relative to test norms and a significant minority of pupils refused to produce a written text. Relative to test norms, spelling scores were depressed for the LI cohort but not the ASD cohort. Twenty-five percent of the pupils did not complete a five minute narrative writing task. Failure to produce the writing samples was associated with lower levels of receptive and expressive language and raised scores on the Social responsiveness scale (SRS).

Autism characteristics

Consistent with pupils' identified SEN, both teachers and parents reported higher levels of autism characteristics (or 'symptoms') in pupils in the ASD cohort compared to the LI cohort. However, the scores of the LI were considerably elevated compared to the population norms, indicating that they also have significant difficulties in some aspects of reciprocal social interaction and communication as well as showing some rigid and repetitive behaviours.

Teacher reports on pupils' behaviour

Teachers highlighted a range of behavioural, emotional and social difficulties (BESD) in the LI and ASD cohorts and described rates that were elevated compared to test norms for a general measure of BESD and for emotional and social difficulties, in particular. However, level of conduct problems was not a major concern. LI and ASD profiles were similar on subscales measuring emotional problems, conduct/behavioural problems and hyperactivity. Impoverished peer interactions and prosocial behaviours were more closely associated with the ASD than LI cohorts, reflecting particular difficulties with social communication in the pupils with ASD. Notably, for the pupils with LI, social interaction with same age peers was a greater issue for older pupils (Years 5 and 7) than younger (Years 1 and 3) pupils.

Pupils' emotional and social well-being

Pupils reported on their own quality of life using the widely used and European Union normed KIDSCREEN measure. ASD pupils reported lower levels of quality of life than LI pupils in terms of subscales indexing psychological well-being, autonomy, parent relations and home life, social support and peers, school environment, and financial resources. The cohorts did not differ from each other on the physical well-being, self-perception, moods and emotions and the social acceptance and bullying subscales. Notably, on indices of moods and emotions, and on social acceptance and bullying both cohorts scored very much lower than the normative sample, indicating more impoverished quality of life. The pupils completed this questionnaire at both Time 1 and Time 2 and showed some improvements in the self-reported quality of life across time, including on the mood and emotion, and on social acceptance and bullying domains on which both cohorts showed particular difficulties at Time 1.

National curriculum attainment and measures of pupil learning

Performance on national curriculum tests highlighted few differences between LI and ASD cohorts. Cohorts showed equivalent performance on all tests at Key Stage 1 and on the maths test at Key Stage 2. However, pupils with ASD scored significantly higher than those with LI on Key Stage 2 English and science tests, consistent with our findings from standardised tests of literacy. Therefore, differences between the cohorts on English and science appeared to emerge over time. Cohorts made the same amount of progress on national curriculum tests between Key Stages 1 and 2, indicating equivalent levels of learning over time. When an experimental task was used to investigate learning as it occurs online and during a short session, we found no cohort differences. Over time the majority of pupils did not change their level of need as defined by the SEN Code of Practice.

Teacher reports of strategies for teaching and learning

Teachers reported that pupils were receiving high levels of support from learning support assistants (LSAs). In addition, for a significant minority of pupils, there was evidence of input from speech and language therapists (SLTs). Importantly, SLT involvement was significantly reduced for pupils in secondary schools. SLTs were also more involved with pupils with ASD than LI. Compared to LSAs and SLTs there was less direct pupil involvement by SENCOs and very little contact with educational psychologist (EP) services.

Teachers reported on their use of 12 different strategies to support pupils' learning. There were few differences between the cohorts (LI and ASD) in use of these strategies, although pupils with ASD were more likely to receive additional IT support and pupils with LI were more likely to have their preparedness for the next step monitored.

Factor analysis revealed two different factors – *structure and content*. These factors effectively refer to what is taught and how it is taught. Greater differentiation of *content* was reported for pupils with LI and there was a trend for greater levels of *structural* differentiation for pupils with ASD. These different patterns were more evident when we considered the relationship between factors and performance on standardised measures. Higher scores on the social responsiveness scale (greater level of difficulty typically associated with ASD pupils) were associated with higher levels of *structural modifications* whereas lower scores on the language and literacy measures (poorer performance more closely associated with LI pupils) were associated with more modifications in the *content* of what was being taught.

Observations of English language and literacy lessons

To our knowledge there have been no previous observational data comparing the classroom learning context for pupils with LI and ASD in English language/literacy lessons. These lessons were targeted for observation because we had predicted that the content of the lessons would be particularly challenging for our participants. Also, these were lessons where we expected to see greatest levels of support and differentiation. Apart from reduced engagement and increased chatting in Year 7 pupils, we found no year group differences.

We found a number of significant differences between the LI and ASD cohorts although variation within groups was often large and there was also considerable overlap between the two cohorts. For the majority of the observation period, pupils were in the mainstream classroom. However, pupils with ASD were significantly more likely to be working with a LSA in the classroom or to be working outside the classroom. Over the observation period, pupils experienced a variety of working arrangements. Here we found that, as might be expected, there was a reduction in whole class activity over the observation period. When pupils were not engaged in whole class teaching they tended to work alone or with a LSA rather than in groups or in pairs.

Observations of task differentiation and off task behaviour varied within and between cohorts. Pupils with ASD-low-NV were significantly more likely to experience curriculum

differentiation at an individual level. Differences in the pupils' scores on standardised measures did not account for this variation; there were no significant correlations with the measures of language, literacy or cognition. Overall pupils were observed to be engaged with the lessons they were in and again we found no significant correlations between levels of engagement and the measures of language, literacy or cognition. There was little evidence of disruptive behaviour or pupils being engaged in tasks which were not relevant to the lesson.

Finally, we recorded instances of particular features of ASD. These were significantly more likely to be recorded for pupils with ASD but also occurred in the LI cohort. Repetitive and stereotypical behaviours observed were significantly associated with scores on our screening measure of autism symptomatology.

SENCO report on support in schools

SENCOs provided data about resources that the target pupils received. Pupils with ASD were reported to receive approximately three times as much LSA time than pupils with LI, consistent with teacher report and classroom observations. There was also evidence of more involvement by SLTs for pupils with ASD. In addition, we found a significant reduction in SLT support in secondary compared to primary schools.

Data indicating other professionals' involvement with the pupils were sparse, suggesting that there was limited direct involvement for our target pupils. It is possible that the SENCOs were not aware of this involvement or that the professional involvement was of a different nature, for example at a strategic school level. Nonetheless it suggests that the primary supports for our participants are school based with the additional support of SLTs.

The amount of administrative support provided for the pupils with LI differed across the two time points. It was unclear why these differences in reported hours occur. At Time 1 the average school administration time for LI pupils was six hours per term but at Time 2 this reduced to three hours per term. There was more stability in the reported termly support allocated to pupils with ASD (Time 1: six hours, Time 2: four hours).

Parental concerns

Consistent with our findings from other sources, interviews with parents indicated a large degree of overlap, as well as differences in the characteristics and needs of children with LI

and ASD. Indeed there were few examples of significant differences between the views of parents of LI and ASD pupils.

The large majority of parents had experienced significant concerns before their child was 5 years old; half had identified concerns by 30 months. Many parents of children with LI and ASD identified speech and language as their first main concern, although parents of children with ASD also reported early autism behaviour features. Early support was most likely to have been provided by an SLT for children with LI but frequency and duration of support varied greatly.

Both cohorts of parents were concerned about speech, language and communication (especially parents of the LI cohort); educational development, especially literacy; and behaviour, particularly difficulties with social communication (especially parents of the ASD cohort), but *not* conduct problems. Despite these concerns about the child's difficulties, parents (especially of children with ASD) were generally positive about improvement over time, especially if their child attended a school with specialist provision.

Parents of children with LI were almost twice as likely as parents of children with ASD to rate their child's peer relations positively (66% LI v 38% ASD). Reports of overt victimization were relatively rare, about 10% of children overall, but twice as common for children with ASD. Parents overwhelmingly reported that additional support at school was provided by SLTs. About 40% of children with LI were receiving SLT support compared with two thirds of children with ASD. This is consistent with reports from teachers and SENCOs and is noteworthy given that according to standardised assessment of language, pupils with LI experience greater need than pupils with ASD.

Despite the difficulties experienced by their children, parents in general were positive – but not uncritical - of their involvement in decision-making during statutory assessment (where appropriate) and decision-making about their child in the present school. According to their reports, the provision made, including support by teachers, was highly regarded by 80% of parents. Nevertheless, there were also indications of limitations in the support received by the pupils. It is also of interest to note the more positive views of parents of children in mainstream schools with specialist resources compared with those of parents whose children were attending mainstream schools without specialist resources.

Predicting reading, attainment, behaviour and classroom differentiation and support

We used a series of multiple regressions to predict pupils' performance and support. In terms of performance on literacy measures, we found that phonological skills predicted word recognition whereas receptive vocabulary was important for reading comprehension. There was some evidence that different factors underpin word recognition for LI (phonology) and ASD (severity of autism symptoms) cohorts. However, these findings are tentative and require replication. In addition, there was evidence that language difficulties and autism symptoms were associated with poorer attainment on national curriculum tests and higher levels of emotional and behaviour problems but the proportion of variance accounted for by these regression models was modest.

Further regression models suggested that different pupil characteristics influenced what is happening in classrooms and what teachers report they are doing, although the variance accounted for was not large. A primary need of ASD resulted in greater observed LSA support in the classroom while poorer working memory was associated with greater observed curriculum differentiation. Teachers' reports of adapting the content of the curriculum was associated with lower levels of oral language whereas teachers' reports indicated that modifications to the ways they taught was associated with greater levels of social impairment.

Implications for practice, research and policy

1. Substantial overlap between the needs of pupils with LI and ASD, as well as differences between these cohorts, highlights the importance of a personalised approach to teaching and learning which reflects an understanding of a pupil's
    a. language learning and literacy needs
    b. social and communication difficulties
    c. and academic progression
2. The ways in which pupils' needs are identified at school, Local Authority, and national levels requires reconsideration. More sensitive data than are currently collected (Key Stage assessments) will allow better
    a. identification of need
    b. and monitoring of progress
3. There is a need to examine the ways in which SLT support and working practices support pupils across

    a. the primary and secondary school sector
    b. language learning and social communication
4. Resources need to be targeted according to both language learning needs and social communication needs
5. Pupils' needs will primarily be met within schools and classrooms. Schools will need to
    a. be aware of the wider impact of language and communication on well-being, behaviour and peer relationships
    b. consider explicitly addressing these issues in the support of these pupils

1. INTRODUCTION

The Better Communication Research Programme (BCRP) was commissioned as part of the Better Communication Action Plan[6], the government's response to the Bercow review of services for children and young people with speech, language and communication needs[7]. This had recommended a programme of research 'to enhance the evidence base and inform delivery of better outcomes for children and young people' (p.50). This is one of 10 publications reporting the results from individual BCRP projects. These contribute to a series of four thematic reports and the main report on the BCRP overall in which we integrate findings and present implications for practice, research and policy from the BCRP as a whole (see Appendix 1 for full details[8]).

Children with SLCN often have academic, emotional and behavioural difficulties that pose a challenge to the professionals working with them. This stream of the Better Communication Research Programme, the prospective study, was concerned with students identified as having either *primary language difficultie*s, which we refer to as language impairments (LI), or autism spectrum disorders (ASD) and who were being educated in mainstream provision in England.

The term SLCN is used in two different ways in educational contexts. The Bercow Review used SLCN as a broad and inclusive term to cover *all* children with speech, language and communication needs including those with primary difficulties with speech, language and communication and also those whose needs are secondary to other developmental factors such as hearing impairment or cognitive impairment. This breadth of use is not consistent with the classification systems used by the DfE to classify special educational needs where SLCN has a narrower primary focus on language and excludes children with ASD, sensory, more general cognitive difficulties, or primary behaviour difficulties. Researchers and speech and language therapists (SLTs) describe a further cohort of children – those with *specific language impairment* (SLI) which is, effectively a subset of the children within the narrower SLCN category. These children are defined as having a primary language difficulty which is not associated with any other developmental difficulty including autism, hearing impairment or other neuro-developmental impairment and whose nonverbal ability is within the average

[6] https://www.education.gov.uk/publications/eOrderingDownload/Better_Communication.pdf
[7] Bercow, J. (2008). *The Bercow Report: A review of services for children and young people (0-19) with speech, language and communication needs.* Nottingham: DCSF. https://www.education.gov.uk/publications/eOrderingDownload/Bercow-Report.pdf
[8] Reports are accessible through the DfE's research site http://www.education.gov.uk/researchandstatistics/research

range (Bishop 1997; Leonard, 1998). The criterion for average nonverbal ability varies across research studies (Dockrell & Lindsay, 2008) and across local authorities (Dockrell et al., 2006; Lindsay, Dockrell, Mackie & Letchford, 2005a).

Within the education classification system both SLCN and ASD are conceptualised as a subset of difficulties relating to communication and interaction. It is these two cohorts of pupils who are the focus of our study.

1.1. Profiles of pupils with SLI and ASD

Recent evidence has indicated a lack of internal consistency within the SLI diagnosis, including identification of different subgroups within SLI, a lack of evidence of their consistency over time and heterogeneity within the population (Conti-Ramsden & Botting, 1999). The functional importance of the 'specific' nature (relative to general cognitive ability) as a distinguishing feature has also been questioned (Tomblin & Zhang, 2006). Furthermore, ASD is, by definition, based on a triad of developmental characteristics (difficulties in social interaction, communication, imagination and rigid and repetitive behaviours), as a consequence of which students will be characterised by a wide variety of different combinations of strengths and difficulties along the three dimensions. For both SLI and ASD, clear operational criteria to identify the disorder are problematic.

While debates about diagnostic criteria raise problems for researchers and practitioners alike there is also increasing interest in comparing the profiles of children with SLI and ASD. The potential overlap between the two cohorts has been a matter of considerable debate (Bishop, 2003; Williams, et al., 2008). SLI is primarily associated with structural language impairments whereas social communication impairments are typically thought to characterise ASD. There is, however, increasing evidence that the boundaries between the two disorders are not clear (Bishop, 2003). Of note are studies indicating that oral language impairments can be observed in ASD and that some features of ASD are exhibited in children diagnosed with SLI.

Language skills in ASD are very variable. While some individuals with ASD do not have obvious difficulties with language, others have language skills which mirror profiles typical of children with SLI; although higher IQ is associated with better language in ASD populations language skills can be independent of IQ (Kjelgaard & Tager-Flusberg, 2001). Nor does it seem to be the case that the language difficulties of children with ASD are less severe for expressive rather than receptive language. Kjelgaard and Tager-Flusberg found no

differences between expressive and receptive tasks which tapped higher order knowledge of syntax and semantics, although single word naming was a relative strength. However, in ASD, speech production can be preserved and there is some indication that pupils with ASD are better at sentence repetition than those with SLI (Whitehouse, Barry & Bishop, 2008). Thus pupils with ASD are at risk of language difficulties but typically do not have problems with speech.

By corollary autism features have been documented in samples of SLI (Bartak, Rutter & Cox, 1975; Bishop, Chan, Adams, Hartley, & Weir, 2000; Conti-Ramsden & Botting, 2004). In a recent large study it was found that 41% of an SLI sample (total *n* = 45) met ASD criteria for social communication impairments on measures commonly used to diagnose ASD (Leyfer, Tager-Flusberg, Dowd, Tomblin, & Folstein, 2008). Pupils with SLI in this study showed difficulties in social behaviours including not showing appropriate interest in other children and failing to spontaneously imitate actions. However, repetitive and compulsive behaviours were seen rarely in SLI.

Overall, the evidence suggests that there is significant overlap between the SLI and ASD populations. This gives rise to important conceptual and research issues. To our knowledge this is the first study to concurrently recruit pupils with LI and ASD from the same mainstream settings. Importantly, few studies have directly compared pupils with LI and ASD so that differences and similarities in their profiles can be specified in detail.

Overlap between the cohorts poses important challenges to the education (and health) systems in terms of appropriate provision. Many studies of SLI and/or ASD draw their samples from speech and language therapy clinics or tertiary diagnostic centres where you might expect difficulties to be more extreme. Yet even in these cases it is clear that diagnosis should not be the only criterion for choice of interventions. Indeed diagnostic labels may provide insufficient or misleading information for service planning or curriculum differentiation. Considering children's profiles across language and social behaviour would provide more information to support decisions about provision to meet the children's needs and is consistent with the diagnosis process in the NICE guidelines on Recognition, Referral and Diagnosis of Children and Young People on the Autism Spectrum[9].

[9] NICE (2011). *Recognition, Referral and Diagnosis of Children and Young People on the Autism Spectrum. NHS* National Institute for Health and Clinical Excellence.

1.2. Implications for educational provision and support for pupils with SLI/LI and ASD

Despite increasing research examining the skills of pupils with SLI and ASD there is relatively little known about the profile of needs of these children in mainstream classrooms, the ways in which their needs are met, or the extent to which the level of support provided is related to the severity of their language difficulties and/or social behaviour. The increased numbers of children identified as having ASD has also led to a consideration of the nature of the provision required for the different cohorts of pupils and the extent to which their needs are similar or different.

In practice, educational provision is increasingly made within mainstream schools, in some cases in specialist provision within schools, including language units and resource bases. However, professionals in England have argued that students with ASD have increasingly occupied ('taken over') specialist provision intended for students with primary language difficulties (Dockrell, et al., 2006; Lindsay et al., 2005a).

Additionally, professionals differ with respect to adherence to a *diagnostic* compared with a *needs-based* approach to assessment and provision (Dockrell et al., 2006; Lindsay et al., 2005b). The needs-based approach adopted by the educational system classifies students' additional learning needs and aims to identify specific service requirements and address individual pupils' needs within the school context (Florian et al., 2006; McLaughlin et al., 2006). Diagnostic approaches argue for a firmer relationship between identified 'conditions' and interventions, with the implicit corollary of different interventions (including placements) for LI and ASD cohorts. However, the usefulness of the diagnostic approach is dependent on the validity of the separation of needs between the cohorts. The overlap between LI and ASD in clinical samples raises considerable challenges for diagnostic systems. But it also has implications for education. If children with LI and ASD in schools show overlap in their cognitive and behavioural profiles, support should be tailored to their needs across these domains.

Two complementary BCRP reports have analysed the national data sets for children with SLCN and ASD and have highlighted differences between the cohorts[10, 11]. These studies have focussed on a broader group of pupils with SLCN but form a backdrop to address

[10] Meschi, E., Mickelwright, J., Vignoles, A., & Lindsay, G. (2012). *The transition between categories of special educational needs of pupils with speech, language and communication needs (SLCN) and autism spectrum disorder (ASD) as they progress through the education system.* London: DfE.

[11] Strand, S., & Lindsay, G. (2012). *Ethnic disproportionality in the identification of speech, language and communication needs (SLCN) and autism spectrum disorders (ASD)* London: DfE.

questions for the more circumscribed groups of pupils with SLI or LI. Having a primary need as SLCN or ASD was a risk factor for low achievement but pupils with SLCN were lower achieving as compared to those with ASD and therefore achievement is an important issue to consider in studies of children with LI and ASD in educational settings. In addition, and relevant to the current project, analysis of the national data set found significant movement during secondary school into and out of the categories of SLCN and ASD, with most movement being between Key Stages 2 and 3. These data suggest that in educational contexts, children identified as either SLI or ASD may differ in their profile of needs in different year groups. It is therefore important to consider year group as well as identified need in any analysis within educational settings.

2. WHAT WE HAVE DONE

We report on a three year prospective study of students identified with either LI or ASD as their primary SEN. Our study was designed to explore their characteristics and the provision made to meet their needs within the education system.

2.1. Key research questions

Our aim was to examine children's language, cognitive and social skills and behaviour with a view to exploring the patterns of difference, similarity and overlap across LI and ASD cohorts. We also sought to investigate how the needs of these pupils impact on support and provision in educational contexts, and on parental views. With these overall aims in mind we addressed the following issues:

1. Performance on standardised measures
    a. Does performance on measures of language, cognition, memory, literacy, autism features, quality of life, behaviour and school attainment differ between LI and ASD cohorts?
    b. In what ways do the cohorts overlap on these key measures?
    c. Do pupils identified at different ages differ in their profiles of need?
    d. Where measures are repeated over time is there stability in pupils' performance?
2. Support and provision in schools
    a. What support is provided and how does this support differ by primary need (LI vs. ASD)?
    b. How do teachers differentiate the curriculum and does this differ by primary need?
    c. How pupils' needs are met in English language and literacy lessons?
    d. What resources are provided by the schools to meet the pupil's needs?
3. How do parents understand their children's needs and how do they consider their needs are being addressed within the educational context?

2.2. Identification of participants

Five Local Authorities (LAs) in the South East of England were identified to reflect the national averages for the proportion of pupils with recorded special educational needs (SEN). We also ensured that the proportion of students with SEN status for SLCN or ASD was at or above the national average and that the performance of students in each LA on combined English and Maths Key Stage 2 national curriculum tests approximated the

national average. Across LAs, 210 mainstream schools were approached, 74 of which agreed to take part in the study.

Pupils were identified who were aged 6, 8, 10, and 12 years, attending mainstream provision and had SLCN or ASD as their primary SEN, according to their school[12]. All spoke English as a first language and had no history of hearing impairment or uncorrected eyesight. From pupils with SLCN, we were interested in recruiting pupils with oral language impairments. As the category implies, pupils in this cohort can have speech, language and/or communication difficulties. Therefore, we conducted a screening phase to identify pupils with SLCN as their primary SEN who had clinically relevant oral language impairments according to the fourth UK edition of the Clinical Evaluation of Language Fundamentals (CELF-4 UK; Semel, Wiig, & Secord, 2006). Pupils were identified as having language impairments if they obtained a standardised score that was below the average range i.e. more than one standard deviation below the mean (< -1*SD*) on either the recalling sentences or word classes (total score) subtest from the CELF-4 UK (see Appendix 2, separate Technical Annex for details of these measures)[13].

In order to allow comparison with published data on clinically-ascertained samples of children with specific language impairment (SLI) and ASD, where the majority of studies have excluded children with low nonverbal ability, our initial intention was to exclude pupils whose nonverbal scores fell below -1*SD* from the mean. Therefore, at screening we also administered the matrices subtest from the second edition of the British Ability Scales (BAS-II; Elliott, Smith, & McCulloch, 1997) as a measure of nonverbal ability (see Appendix 2, separate Technical Annex for details of this measure). Pupils were included in the study if they obtained a standardised score that was in the average range or above. This process yielded two cohorts of pupils, pupils with language impairment and average nonverbal ability (LI-av-NV cohort) and pupils with ASD and average nonverbal ability (ASD-av-NV cohort).

The screening phase resulted in the emergence of two additional cohorts of students, those with LI or ASD but nonverbal ability below our research criterion. Pupils with language impairments and below average nonverbal ability (LI-low-NV) and ASD and below average nonverbal ability (ASD-low-NV) were included in the study to reflect the range of pupils with SLCN and ASD found in mainstream primary and secondary schools. This allows our data to

[12] The School Census requires schools to identify and notify the Department for Education (DfE) of pupils with special educational needs. Schools provide information about level of need and type of primary need.
[13] For a fuller explanation see Section 3.1 on our approach to data analysis

be informative about needs and provision in mainstream schools for as wide a group of pupils as possible.

In summary, four cohorts of students were included in this study: LI-av-NV, ASD-av-NV, LI-low-NV and ASD-low-NV. See Table 2.1 for a summary of selection criteria for these cohorts.

Table 2.1. Summary of selection criteria for the four cohorts

Cohort	Primary need identified by school	Language status	Nonverbal ability status
LI-av-NV	SLCN	Below average (< -1SD)	Average or above
ASD-av-NV	ASD	n/a	Average or above
LI-low-NV	SLCN	Below average (< -1SD)	Below average (< -1SD)
ASD-low-NV	ASD	n/a	Below average (< -1SD)

2.3. Design

This study utilised a cross-sequential design, allowing both longitudinal (Time 1 vs. Time 2) and cross-sectional (pupils recruited in four school years) comparisons. Table 2.2 indicates the time points at which data were collected and the year groups of pupils at each time point. Pupils from four year groups were identified in the initial screening phase, which lasted from November 2009 until January 2011. The majority of pupils (90%) were screened between November 2009 and July 2010 (2009/2010 academic year) when they were in school Years 1, 3, 5 and 7. Remaining pupils were identified from school Years 2, 4, 6 and 8 in the autumn term of the following year to ensure that they were from the same age cohorts. For simplicity, in the remainder of this report we will refer to these groups of children as being recruited from school Years 1, 3, 5 and 7.

Table 2.2. Data collection phases and ages of pupils at each phase

Year group	Screening phase (11/2009 – 01/2011)		Time 1 (03/2010 – 06/2011)		Time 2 (09/2011 – 12/2011)	
	School year group/s	*M*age (*SD*)	School year group/s	*M*age (*SD*)	School year group/s	*M*age (*SD*)
Year 1	1 and 2	6.00 (.51)	1 and 2	6.59 (.37)	3	7.53 (.34)
Year 3	3 and 4	7.92 (.38)	3 and 4	8.63 (.26)	5	9.56 (.30)
Year 5	5 and 6	9.91 (.49)	5 and 6	10.52 (.30)	7	11.51 (.28)
Year 7	7 and 8	11.93 (.39)	7 and 8	12.63 (.38)	9	13.61 (.33)

Note. *M*= mean; *SD* = standard deviation

Data from a wide range of measures (see Appendix 2, separate Technical Annex for details of measures) were then collected at Time 1 and Time 2, with selected measures repeated across these time points to provide longitudinal data. Time 1 was conducted between March 2010 and June 2011 and Time 2 between September and December 2011. On average, there were eight months between the screening phase and Time 1 (*M*= 7.98, *SD* = 3.02) and 12 months between Time 1 and Time 2 (*M*= 11.54, *SD* = 2.05).

All pupils who were identified by schools, and had either speech and language (*n* = 216) or ASD (*n* = 106) as a primary need, were screened. Parents were provided with detailed information about the study and given the opportunity to opt out if they did not want their child to take part[14]. Between the screening phase and Time 1, we wrote to parents again. This time we asked them to opt in to the study. Students were only seen at Time 1 and Time 2 if their parents had given informed written consent for them to take part in the study (resulting *n* = 171). Figure 2.1 provides details of the number of pupils who were selected for inclusion and the number of pupils who were lost to the study due to failure to obtain consent or attrition[15].

[14] Ethical approval for the BCRP Prospective Study was given by the Humanities and Social Sciences Research Ethics Committee at the University of Warwick.

[15] Analyses were conducted to investigate whether there were any differences between pupils opting into the study and those not participating. No significant differences were found on screening measures and participation was not associated with cohort or type of placement.

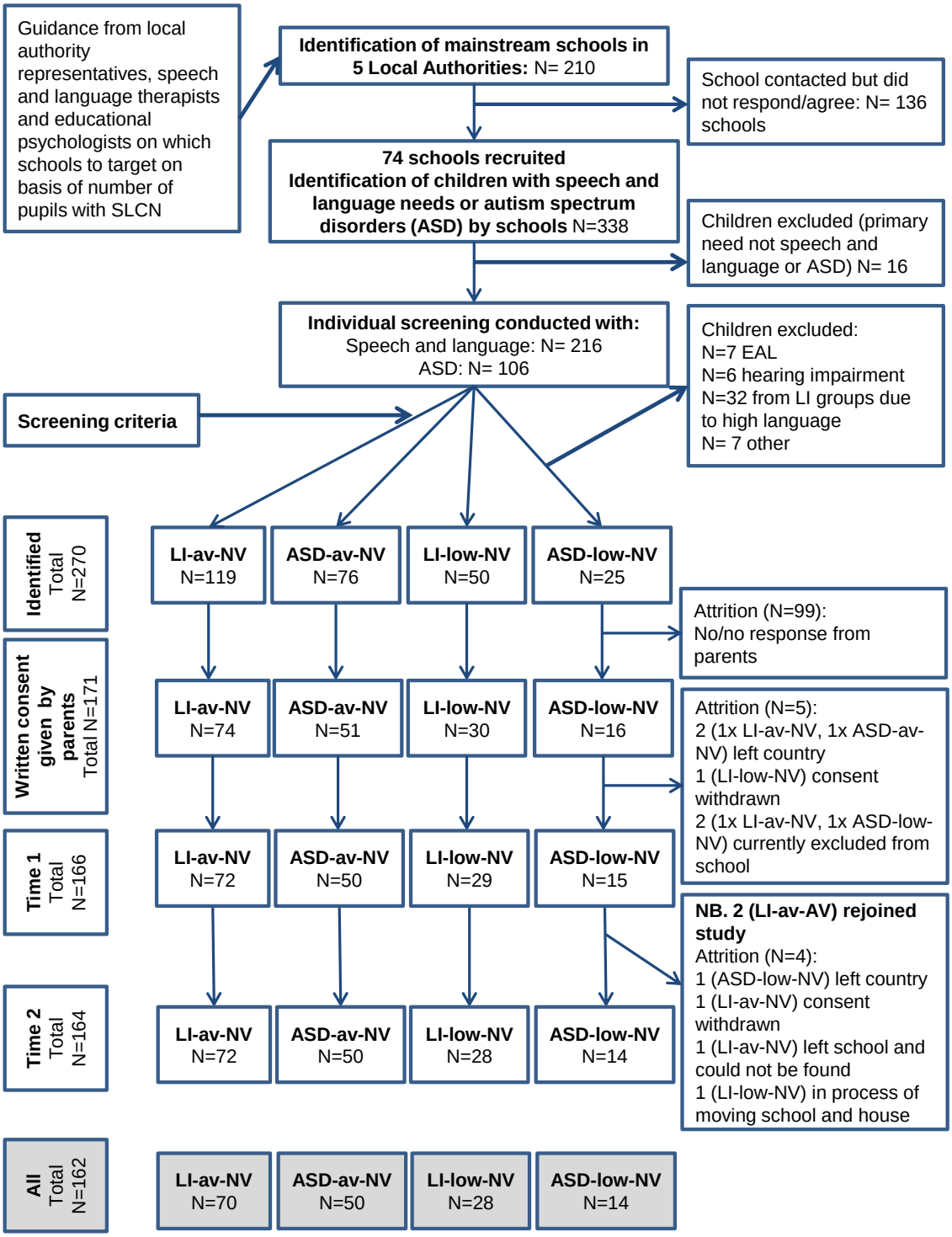

Figure 2.1. Flow diagram showing inclusion criteria, exclusion criteria and attrition

As Figure 2.1 shows, 162 pupils across LI-av-NV (*n* = 70), ASD-av-NV (*n* = 50), LI-low-NV (*n* = 28) and ASD-low-NV (*n* = 14) cohorts took part in all phases of the study. Table 2.3 includes the number of pupils in each year group within each cohort and further details of these pupils are provided below.

Table 2.3. Number of pupils by year group and cohort

Year group at screening	LI-av-NV	ASD-av-NV	LI-low-NV	ASD-low-NV
1	25	6	4	2
3	16	14	9	5
5	13	9	5	3
7	16	21	10	4

2.4 Participant characteristics at screening

As described above, recalling sentences and word classes subtests from the CELF-4 UK (language) and the matrices subtest from the BAS-II (nonverbal ability) were administered to pupils at screening. Figure 2.2 presents mean *Z* scores and standard deviations (the error bars) for the four cohorts on these language and nonverbal ability measures (for an explanation of *Z* scores and our approach to analysis, see the Results section).

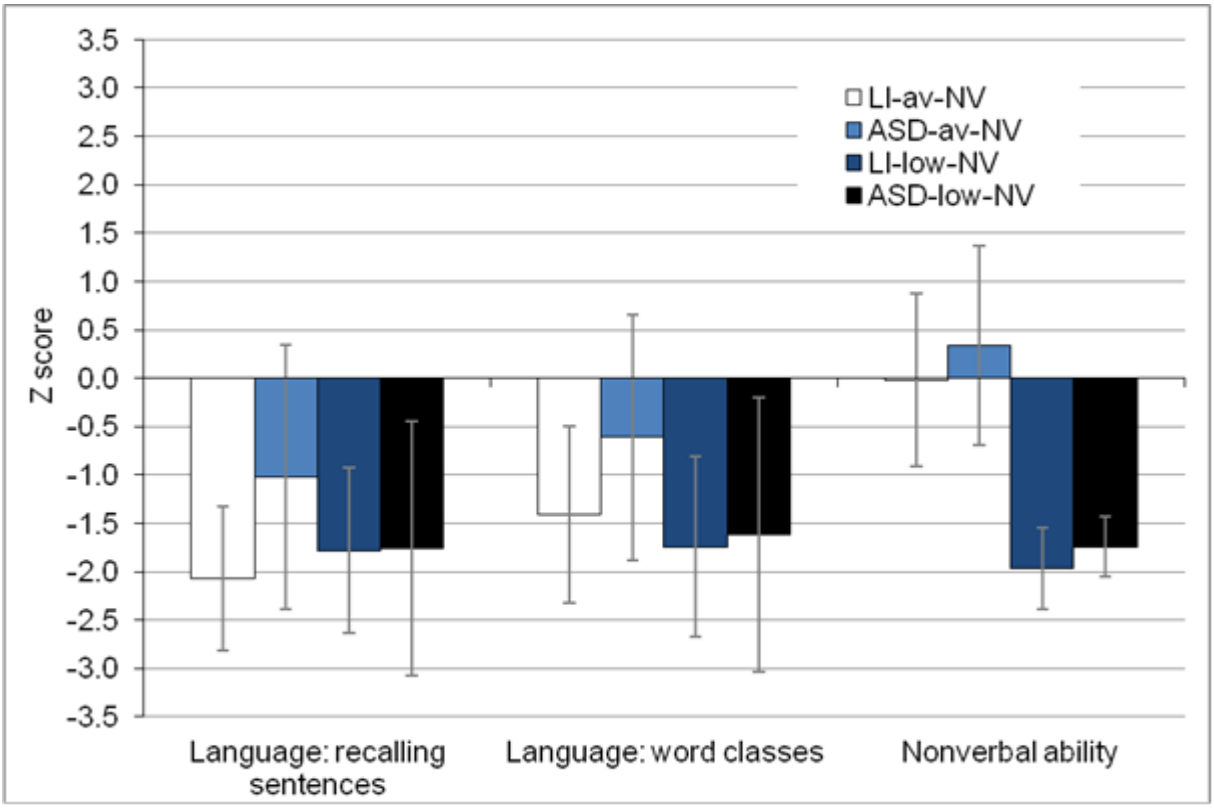

Figure 2.2 Performance (M±SD) on language and nonverbal ability screening measures

As shown in Figure 2.2, the error bars indicate that language scores were very variable, both across and within cohorts and the majority of cohort means were below the average range

(*Z* < -1SD). Language performance was particularly variable in the ASD cohorts. For recalling sentences and word classes, the ASD-av-NV cohort significantly outperformed the LI cohorts (LI-av-NV and LI-low-NV). On both measures, the ASD-low-NV cohort obtained intermediate mean *Z* scores that did not differ significantly from those of any other cohort. On the nonverbal ability measure, the average nonverbal ability cohorts (LI-av-NV and ASD-av-NV) performed at a significantly higher level than the low nonverbal ability cohorts (LI-low-NV and ASD-low-NV), consistent with the selection criteria described above. There was no significant difference on the nonverbal ability measure between the two average ability cohorts. Similarly, participants in the two low nonverbal ability cohorts did not differ in their nonverbal ability scores.

During this phase, teachers were also asked to complete the Social Responsiveness Scale (SRS; Constantino & Gruber, 2005) as a measure of autism symptomatology. The SRS was completed for 146 pupils (90%) across LI-av-NV (*n* = 60, 86%), ASD-av-NV (*n* = 48, 96%), LI-low-NV (*n* = 26, 93%) and ASD-low-NV (*n* = 12, 86%) cohorts. It yields a total score and subscale scores on social awareness, social cognition, social communication, social motivation, and autistic mannerisms. In this case higher *Z* scores reflect a greater degree of difficulties. Figure 2.3 shows mean *Z* scores and standard deviations on the SRS.

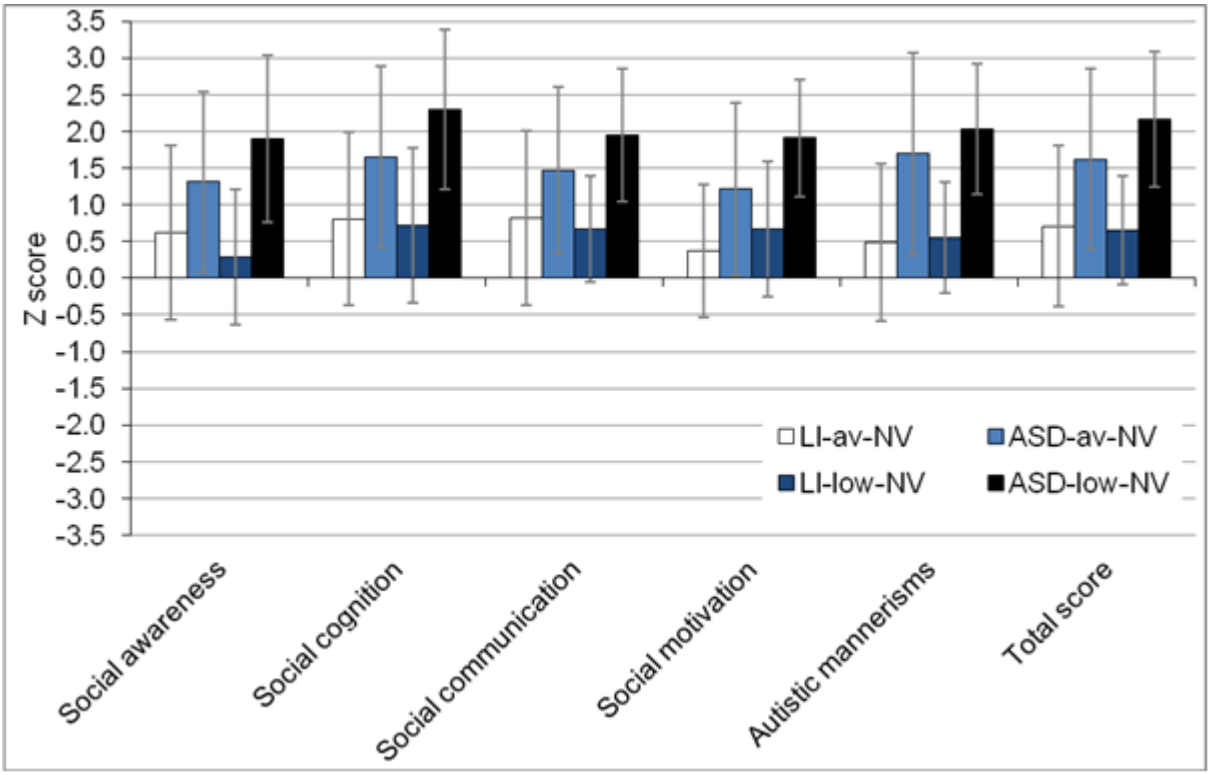

Figure 2.3. Teacher report (M±SD) on the SRS at screening

As Figure 2.3 indicates, LI cohorts obtained mean *Z* scores that were within the average range whereas the ASD cohort means were elevated relative to the test average. This is consistent with their type of identified SEN. Analyses indicated that for the majority of SRS scores (total, social awareness, social cognition, social communication and autistic mannerisms), mean *Z* scores of the LI-av-NV and LI-low-NV cohorts were equivalent, as were scores of the ASD-av-NV and ASD-low-NV cohorts; and LI cohorts showed significantly lower scores than ASD cohorts. Scores on the social motivation subscale followed the same pattern except that the LI-low-NV cohort obtained a mean *Z* score equivalent to the ASD-av-NV cohort.

To examine age-related effects on screening measures, we focused on pupils who were recruited in Years 3, 5 and 7 and collapsed cohorts by nonverbal ability to form two cohorts; LI versus ASD (see Results section for a rationale). For nonverbal ability and the SRS total score (controlling for nonverbal ability), performance did not vary significantly by year group, nor did cohort interact with year group. For recalling sentences and word classes language measures (controlling for nonverbal ability) there was an interaction between cohort and year group (though no year group effect), which reflected two patterns of results. First, within the ASD cohort, pupils in Year 7 showed significantly less difficulty with oral language than those in Year 3[16] (no other year group differences observed in LI and ASD cohorts). Second, in Year 7, the ASD cohort showed significantly less difficulty than the LI cohort (no other cohort effects within year groups). Figure 2.4 shows performance for ASD and LI cohorts and pupils in Years 3, 5 and 7 for measures where significant year group effects and/or interactions between cohort and year group were observed. Recalling sentences and word classes, differed significantly only in Year 7 where the ASD pupils score higher than the LI pupils.

[16] As standard scores are used, this is a measure of *relative* difficulty.

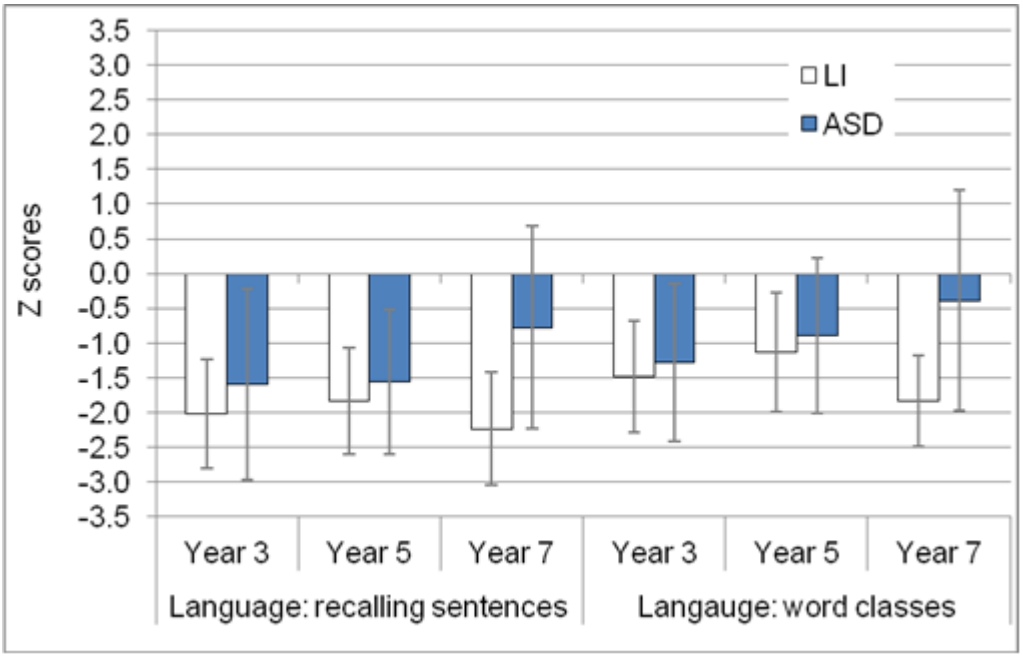

Figure 2.4. Performance (M±SD) on recalling sentences and word classes across year groups

When they were recruited (screening phase), all pupils included in the study were attending mainstream schools. However, some of these pupils were supported within ASD provision at a mainstream school (*n* = 14 from ASD cohorts, which corresponds to 22% of pupils with ASD) and some within language provision at a mainstream school (*n* = 29 from LI cohorts i.e. 30% of pupils with LI and *n* = 1 from ASD cohorts i.e. 2% of pupils with ASD). Pupils attending specialist provision were included in our study only if they were spending the majority of their time in the mainstream class. Figure 2.5 depicts mean *Z* scores and standard deviations across pupils placed in exclusively mainstream settings, mainstream with language provision and mainstream with ASD provision on recalling sentences (CELF-4 UK), word classes (CELF-4 UK), nonverbal ability (matrices from BAS-II) and autism symptomatology (total score from SRS) screening measures.

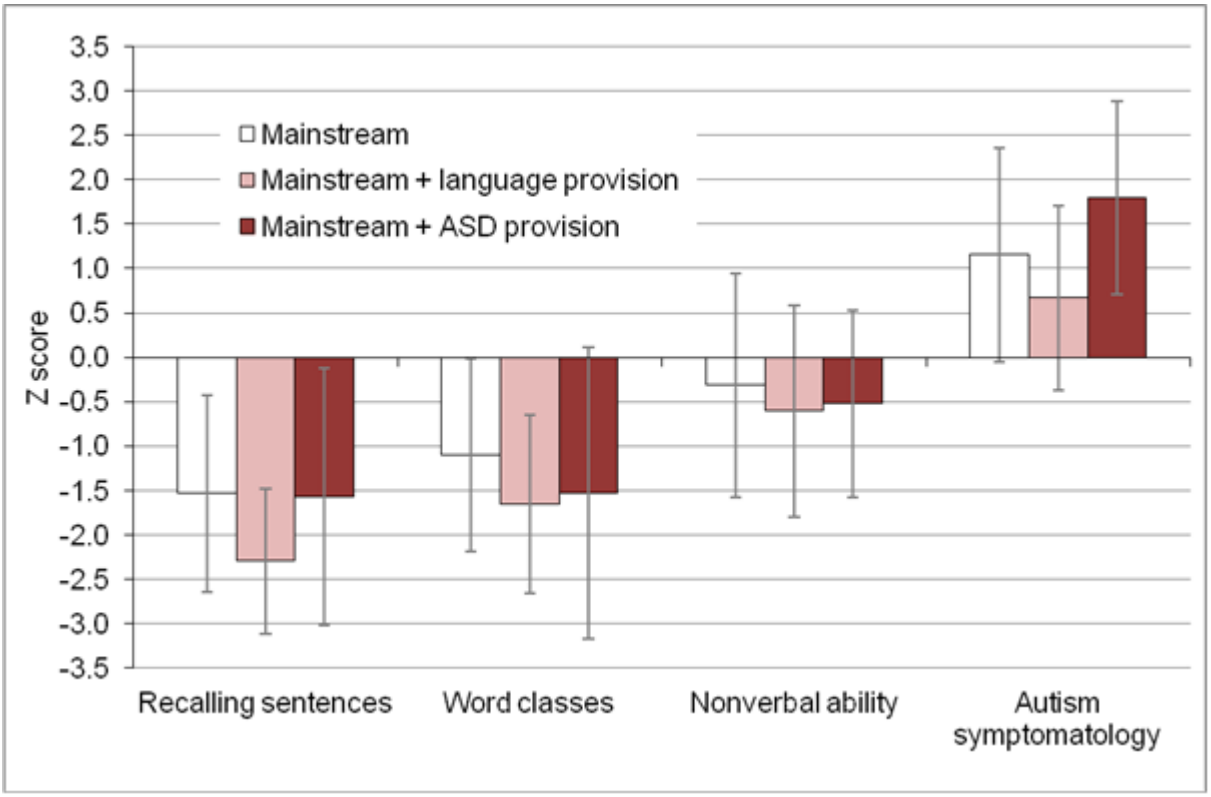

Figure 2.5. Performance (M±SD) on screening measures by type of provision

For recalling sentences, pupils in mainstream with language provision obtained significantly lower mean *Z* score than those in mainstream or mainstream with ASD provision. There was no difference between mainstream and mainstream with ASD provision. For word classes and nonverbal ability the pattern was different, with no significant differences between types of placement on either measure. In terms of the SRS, pupils attending mainstream with ASD provision had significantly elevated levels of autism symptomatology than those attending mainstream with language provision. Children attending mainstream obtained intermediate mean *Z* scores and did not differ significantly from those attending mainstream with language or ASD provision. In sum, recalling sentences (a measure of expressive language) differentiated between pupils placed in mainstream settings with language provision and those placed in other types of setting. The autism symptomatology measure differentiated between types of SEN provision but not between mainstream only and mainstream with SEN provision.

2.5 School Census data

During the course of the project, the Department for Education (DfE) provided us with School Census data for the pupils participating in our study on level of SEN provision (School

Action, School Action Plus, statement of special educational needs)[17], type of SEN (SLCN, ASD, etc.) and indicators of socioeconomic status (SES). The Census was carried out in January 2010, which corresponds approximately to our screening phase (November 2009 to January 2011). During the screening phase, we obtained information on the level of SEN provision and type of SEN for each pupil participating in the project. Information was usually supplied by the school's SENCO but in some cases by a SLT or teacher. We did not obtain information from schools about eligibility for free school meals (FSM) or other indices of SES as this information was provided by the DfE.

2.5.1. Agreement between level and type of need as reported by schools at screening and that reported in the School Census dataset

Table 2.4 presents information on the agreement between level of SEN as reported by school staff (columns) and that reported in the School Census data (rows). Data were provided by the DfE for 159 pupils, which correspond to 98% of the sample. As Table 2.4 shows, there was good but not perfect agreement between the two data sources. It is worth noting the dynamic nature of pupils' movement between different SEN categories and that levels of identified need are subject to change over time[18]. Therefore, discrepancies may be due to differences in timing between School Census data (January 2010) and our screening phase (November 2009 to January 2011) and are in line with those identified in the national data set analyses.

[17] School Action: additional support provided by the school; School Action Plus: provision is also made by professions external to the school, including SLTs and EPs; statement: the pupil's additional provision to meet their SEN is determined by the local authority as a result of an assessment under the Education Act 1996.

[18] Meschi, E., Mickelwright, J., Vignoles, A., & Lindsay, G. (2012). *The transition between categories of special educational needs of pupils with speech, language and communication needs (SLCN) and autism spectrum disorder (ASD) as they progress through the education system.* London: DfE.

Table 2.4. Agreement in level of need as reported by schools at screening and in the School Census

	Reported by school at screening			
data	School Action	School Action plus	Statement	Row totals
None	1 (7%)	2 (3%)	1 (1%)	4 (3%)
School Action	8 (57%)	2 (3%)	1 (1%)	11 (7%)
School Action Plus	4 (29%)	63 (93%)	3 (4%)	70 (44%)
Statement	1 (7%)	1 (1%)	72 (94%)	74 (47%)
Column totals	14 (100%)	68 (100%)	77 (100%)	159 (100%)

Note. Figures in brackets correspond to the percentage of pupils from each category reported by schools at screening (columns) that fall into each School Census category (rows).

Schools provided information on level of need, as defined by the SEN Code of Practice, for all pupils at screening (SLCN: *n* = 98, ASD *n* = 64), 93% of pupils at Time 1 (SLCN: *n* = 91, ASD *n* = 59) and 99% of pupils at Time 2 (SLCN: *n* = 98, ASD *n* = 63). Therefore, changing level of need could be explored between screening and Time 1 (a period of approximately 8 months), Time 1 and Time 2 (approximately 12 months) and between screening and Time 2 (approximately 20 months). Where data were available, each pupil was given a code indicating whether their level of need changed over time or did not change. For the majority of pupils, level of need did not change between screening and Time 1 (SLCN: 82%, ASD 85%), Time 1 and Time 2 (SLCN: 85%, ASD 92%) and screening and Time 2 (SLCN: 82%, ASD 84%). There was no association between cohort (SLCN vs. ASD) and status (change vs. no change) for any time lag (screening – Time 1: $\chi^2(1) = .14$, *ns*; Time 1 – Time 2: (1) $\chi^2 = 1.55$, *ns*; screening – Time 2: $\chi^2(1) = .17$, *ns*).

Table 2.5 depicts agreement between the type of SEN reported by school staff at screening (columns) and that reported in the School Census data (rows). Data were provided for 144 pupils, 89% of the sample. The reduced number of cases was due to School Census data on type of need being available only for those pupils identified by the School Census data as School Action Plus or with statement (not School Action). As Table 2.5 indicates, there is agreement for the majority of pupils in SLCN and ASD cohorts. However, there were discrepancies, especially for SLCN pupils. As above, discrepancies may be due to the different time points at which data were collected. In addition, our findings are consistent with the proposition that SLCN reflects a broad category of language needs[19].

[19] Meschi, E., Mickelwright, J., Vignoles, A., & Lindsay, G. (2012) op cit.

Table 2.5. Agreement in type of need as reported by schools at screening and in the School Census

	Reported by school at screening		
data	SLCN	ASD	Row totals
SLCN	49 (58%)	9 (15%)	58 (40%)
ASD	3 (4%)	47 (78%)	50 (35%)
MLD	18 (21%)	2 (3%)	20 (14%)
BESD	5 (6%)	2 (3%)	7 (5%)
SPLD	4 (5%)	0 (0%)	4 (3%)
PD	2 (2%)	0 (0%)	2 (1%)
Other	3 (4%)	0 (0%)	3 (2%)
Column total	84 (100%)	60 (100%)	144 (100%)

Note: Figures in brackets correspond to the percentage of pupils from each category reported by schools at screening (columns) that fall into each School Census category (rows). SLCN = Speech, Language and Communication Needs; ASD = Autistic Spectrum Disorder; MLD = Moderate Learning Difficulty; BESD = Behaviour, Emotional and Social Difficulties; SPLD = Specific Learning Difficulty; PD = Physical Disability; Other = Other Difficulty/Disability

2.5.2. Socioeconomic status

Two indices of socioeconomic status (SES) were provided by the School Census data; whether or not the pupil was currently eligible for free school meals (FSM) and their Income Deprivation Affecting Children Indices (IDACI) score. IDACI scores were derived from the pupils' postcodes. Data were available for 168 pupils; 98% of the sample. Figure 2.6 summarises these data for LI and ASD cohorts, with the percentage of children eligible for FSM in panel a, and mean IDACI scores and standard deviations in panel b. Panel a also shows proportion FSM eligibility for the population from which our sample was drawn, that is all pupils attending schools in the local authorities that took part in our study.

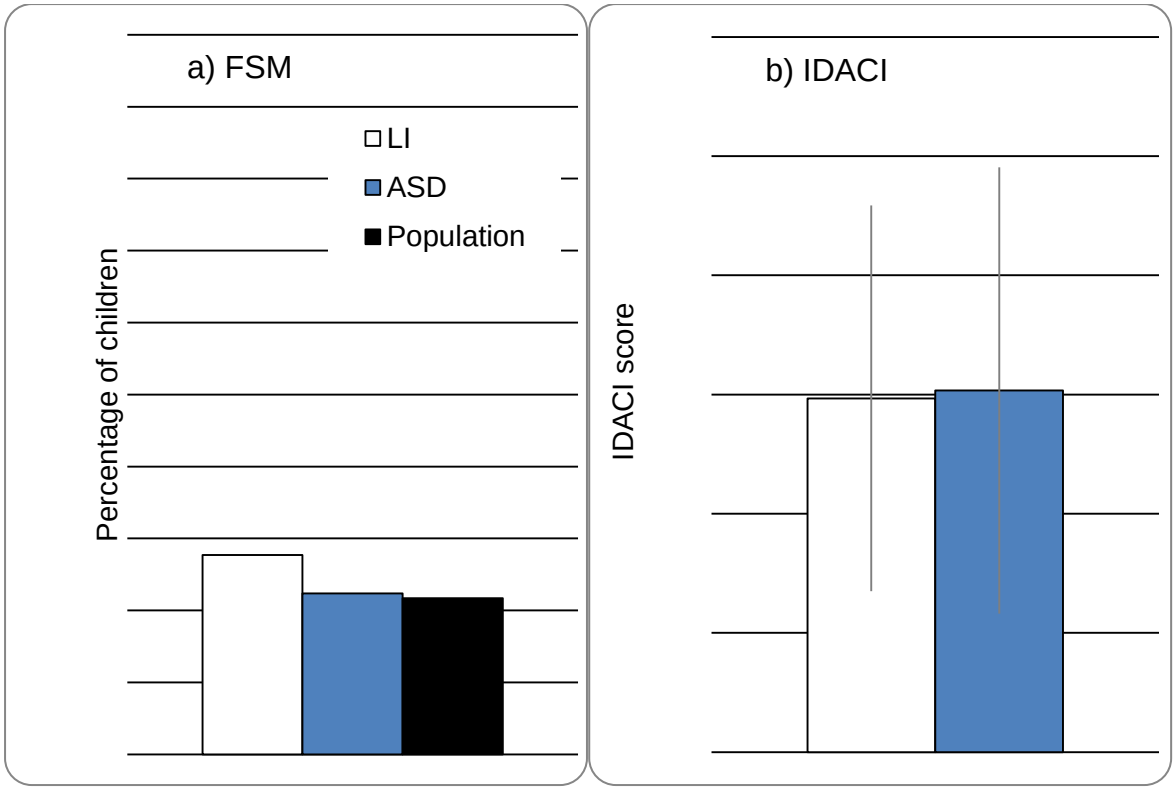

Figure 2.6. Socioeconomic status across the four cohorts as indexed by a) free school meal (FSM) eligibility and b) Income Deprivation Affecting Children Indices (IDACI) score

As panel b of Figure 2.6 shows, IDACI scores were equivalent across cohorts. This was supported by analyses controlling for age and nonverbal ability. There was no effect of year group and no year group by cohort interaction on the IDACI score. The percentage of children eligible for FSM (panel a of Figure 2.6) was also equivalent across the cohorts and was on par with FSM eligibility in the population from which our sample was taken.

2.6. Measures

For this study we employed a combination of standardised assessments and bespoke instruments. Details of standardised tasks are provided in Appendix 2, separate Technical Annex. Below we describe the remaining tasks.

2.6.1. Writing task

A curriculum based writing task was completed by pupils at Time 1 and Time 2 in which they were presented with a prompt (‘one day I had the best day ever at school’) and asked to write the best story or description they could. Pupils were given time to think about it and then five minutes to write. They were encouraged to guess unknown spellings and were

given an opportunity to ask questions before starting the task. Texts were scored for the number of words written, the number of words spelled correctly and the number of correct word sequences. For the correct word sequences measure, a score of 1 was given for each word-word or word-punctuation sequence used correctly. For example, a score of 5 would be allocated for the sentence 'I am a happy elf.' i.e. 'I am' = 1, 'am a' = 1, 'a happy' = 1, 'happy elf' = 1 and 'elf.' = 1.

2.6.2. Word learning task

At Time 1, pupils completed a word learning task in which they learned the meaning of 12 novel letter strings (nonwords). Each nonword was paired with a referent in the form of a picture of a novel object. Pupils were given the opportunity to learn nonword-referent mappings across three learning trials. During each trial, each nonword was heard at the same time as viewing its referent and pupils were asked to repeat the nonword. Learning for that trial was then assessed by presenting each referent and asking children to produce the associated nonword. This process of repetition and production was repeated twice more, forming three learning trials. This process resulted in three measures of learning: the number of objects that were correctly named in trial 1, trial 2 and trial 3[20].

2.6.3. Observation schedule

An observation schedule was developed in order to observe pupils' behaviour in class and the classroom support that they received. We chose to observe lessons in either literacy (primary school pupils) or English (secondary school pupils) because these are lessons that we predicted would be most challenging for our participants who have language and communication difficulties and as such would be contexts where they would receive additional support. The observation schedule was administered at Time 1.

2.6.3.1. Development and piloting

The observation schedule was developed across three phases of piloting. In the first phase, we observed a secondary English lesson at a special school for pupils with specific language impairments. One observer completed the draft proforma derived from previous observation schedules (e.g., Blatchford, 2009) and a second observer took notes on classroom interaction and activities. A number of changes were made, in order to tap difficulties with identifying on task behaviour and the need for greater precision in identifying lesson

[20] For more details of this experiment, see Ricketts, Bishop, & Nation (2009).

objectives and differentiation. The second and third stages of piloting were conducted in two mainstream primary and secondary schools. The aim was to check administration of the tool whilst also establishing initial inter-rater reliability. To establish initial inter-rater reliability four pupils were observed, all of whom were on the school's SEN register for SLCN but were not participating in the study. In the primary school, the observations were conducted in Year 2 (one pupil) and Year 4 (one pupil) classrooms. In the secondary school, the observations were conducted in Year 7 (one pupil) and Year 9 classes (one pupil). Two researchers simultaneously used the observation schedule for each pupil and agreement between them was very high (average agreement 87%). A copy of the materials used by observers can be found in Appendix 3, separate Technical Annex.

2.6.3.2. Procedure for administration

Prior to the start of the literacy/English lesson teachers were asked a set of questions to establish a rapport between the observer and class teacher and provide both individuals with background information. Teachers were also asked about lesson targets that had been set for the whole class and for the pupil and the support (if any) that would be provided for the pupil (see Appendix 3, separate Technical Annex for a full set of questions). The observer found a place in the classroom at the start of the lesson from which they had as clear a view as possible of the pupil. The observation period started 10 minutes after the beginning of the lesson. The observer used this time to complete information about the number of pupils in the class, the content of the lesson, any objectives specified, where the pupil was sitting and whether visual aids had been used. The observer also added to these sections at the end of the observation.

During the observation, codes for five categories were logged, providing information on the pupil's location (location), who they were working with (working with), whether the task was being differentiated (task differentiation), whether the pupil was engaging with the lesson (engagement) and the occurrence of features characteristic of the autism spectrum (autism features). The observation lasted for 20 minutes and this time was divided into 10 blocks of two minutes each providing 10 time points per observation. Observation codes for location, working with, task differentiation and engagement were logged as close as possible to the middle of each block (i.e. minute 1, minute 3, minute 5 and so on). Codes for these categories were mutually exclusive. The occurrence of characteristic autism repetitive and stereotyped behaviours was logged for the whole two minute period and each type of behaviour was only coded once during this period.

2.6.4. Teacher questionnaire on strategies and curriculum differentiation

At Time 1 and Time 2, class teachers (primary school pupils) or English teachers (secondary school pupils) completed a questionnaire (see Appendices 4 and 5). This questionnaire requested information about the support children received in schools from LSAs, SENCOs, SLTs and other professionals. In addition we asked teachers to state whether they differentiated the curriculum for the named pupil. Teachers were then asked to rate their use of different strategies to support learning and engagement in the classroom context. This was done using a five point scale (from 'never used' to 'used all the time'), alongside which there was also an option of 'not appropriate'. The strategies were derived from what is known about effective practice and special needs pedagogy (Norwich & Lewis, 2005). We also asked teachers to identify any other approaches they used to support learning and engagement in the classroom.

2.6.4.1. Development of the questionnaire

The questions relating to support were factual questions about what the teacher believed was happening for the pupils. These questions have been used in other questionnaires and were not piloted. In contrast, the questions addressing differentiation strategies had not been used before. These questions were based on a set of critical features which have been shown to support learning and where a different emphasis on the particular features would be required for different children at different time points (Brown, 1988; Anderson, 1990). It is argued that these features can be applied to optimise learning but they need to be both conceptualised and operationalised in relation to the individual child's learning and developmental needs and to the setting in which the teaching and learning are to take place (Lewis & Norwich, 2005).

We set out to identify the ways in which teachers reported their approaches to teaching those who were learning more slowly, might need more time to learn and require more deliberate planning to ensure progress (Reason, 1998). We aimed to include strategies that focussed on processes of learning and engagement. The questionnaire was piloted on a group of teachers not involved in the present study at which point appropriate modification and clarifications were made.

2.6.4.2. Procedure for administration

Teachers were provided with the questionnaire, completed it in their own time, and forwarded it to the research team.

2.6.5. SENCO questionnaire on provision for pupils

SENCOs completed a questionnaire at Time 1 and Time 2, which was designed to elicit information about the support that each pupil was receiving and its cost. It was anticipated that the data would provide a basis for examining cost effectiveness.

2.6.5.1. Development

A questionnaire (see Appendices 6 and 7) was developed to ask SENCOs to provide information about support for the pupils with LI and ASD attending their schools. Specifically, we asked SENCOs to comment on the type of support, its frequency and its cost.

Factual questions were asked about the following domains: specialist provision made within the school for the specific child (e.g., from LSAs, SENCOs or a resource base); support from professionals external to the school (in particular SLTs and EPs); administrative and other support (e.g., time for writing reports, meeting parents); and special resources purchased outside normal school provision (e.g., specialist programmes).

2.6.5.2. Procedure for administration

The questionnaire was discussed with the SENCO who completed it in his/her own time and returned it to the research team.

2.6.6. Parent interview

We considered it important to access the views of parents of the children and young people in our sample. Parents' rights have increased greatly over the last few decades, not least in the SEN field where the Education Act 1981 made it a statutory requirement that accessing and taking account of parents' views be a part of the statutory assessment procedure. However, as the Lamb Inquiry[21] demonstrated, many parents lacked confidence in the SEN system despite many examples of good practice by professionals, local authorities and health trusts. A major finding of the Lamb Inquiry, and demonstrated clearly by the pilot projects set up to improve parental confidence, was the need to involve, listen to and empower parents[22].

[21] Lamb, B (2009). *Lamb Inquiry: Special Educational needs and parental confidence*. Nottingham: DCSF Publications

[22] See also Peacey & Lindsay (2010). *Increasing parents' confidence in the special educational needs system: Study commissioned to inform the Lamb inquiry. Interim report.* http://www.dcsf.gov.uk/lambinquiry

We know from our earlier work that parents' knowledge (e.g., of the child's early life) and their perspectives on their child's current experiences (e.g., progress at school) provide most useful information for triangulation of evidence from other sources (Lindsay & Dockrell, 2004). Furthermore, our view is that it would be inappropriate for a study of this type *not* to attempt to capture parents' information. Indeed, the BCRP included a separate research strand examining parents' preferred outcomes for their children[23].The results from this study have been combined with results from the parents preferred outcomes and other BCRP studies to form the basis of a separate thematic report[24].

2.6.6.1. Development

A semi-structured interview schedule was created to be administered by telephone to parents. The main areas addressed were: identification of the child's SEN; support in the early years; current schooling (including educational progress, social relationships, support to meet the child's needs); and parents' hopes and aspirations. The use of open ended questions, followed by more specific probes, was employed to allow both a conversation style and parent direction of the discussion, together with coverage of all main topics we wanted to address. We also used specific questions that required yes/no answers plus comments and ratings using five point scales, for example 'How would you describe XXX's (child's name) educational progress at school over the last year?' (Scale from 'very good' to 'not good at all', plus 'don't know').

2.6.6.2. Procedure for administration

Interviews were carried out by telephone over the period April 2010 to February 2011. The average length of an interview was 35-45 minutes. The interviewer (LP) was blind to the child's cohort (LI vs. ASD). Parents were initially contacted by letter. This provided them with information about the interview and assured them of complete confidentiality. This was followed up by a phone call in which LP arranged an appointment for the interview to be conducted. During the interview, parents were again provided with information about the interview's purpose, assured of confidentiality and non-identification of the parent, child or school and advised that they could stop the interview at any time.

[23] Roulstone, S., Coad, J., Ayre, A., Hambley, H., & Lindsay, G. (2012). *The preferred outcomes of children with speech, language and communication needs and their parents.* London: DfE.
[24] Roulstone, S & Lindsay, G. (2012). *The perspectives of children and young people who have speech, language and communication needs, and their parents.* London: DfE.

3. WHAT WE HAVE FOUND

3.1. Approach to data analysis

In the following sections we present data for the pupils' performance on standardised measures, ratings on parent and teacher questionnaires, data from classroom observations and details of interviews with parents. Each section reflects a different dimension of the data that have been collected.

Data for all standardised measures have been transformed to *Z* scores, which have a mean of 0 and a standard deviation of 1. These *Z* scores are derived from scores using the test normative samples and take into account the age of participants[25]. For example, in relation to the test's normative sample, a pupil with a *Z* score of 0 performed at the average level for their age and a pupil with a *Z* score of -1 showed performance one standard deviation below average for their age. *Z* scores and other standardised scores provide useful measures for considering progress over time. Since they take age into account, if progress is steady then they will remain relatively constant over time. A declining *Z* score indicates that a pupil is falling behind relative to their peers.

Figure 3.1 presents hypothetical data on two tasks (A and B) to provide an example of how mean and standard deviation *Z* scores will be presented in the remainder of the results section. Cohorts are denoted by different coloured bars. The size of each bar reflects the cohort's mean and the vertical error bar represents its standard deviation. A bar that extends above the x-axis indicates a mean that is above average (the test mean) and a bar that extends below the x-axis indicates a mean that is below average. The average range is typically taken to be scores that are within one standard deviation from the mean (*Z* of -1 to 1) as 68% of scores are expected to fall within this range in data that are normally distributed. Figure 3.1 shows that on 'Task A' the ASD-av-NV cohort obtained a mean score that was half a standard deviation above average whereas the LI-av-NV, LI-low-NV and ASD-low-NV cohort had means that were one standard deviation below average. On 'Task B', the two language impaired cohorts (LI-av-NV, LI-low-NV) obtained means that were one standard deviation above average, whereas the two ASD cohorts (ASD-av-NV, ASD-low-NV) obtained means that were just below average.

[25]Test manuals typically provide standard scores, scaled scores or T scores. An average or mean score corresponds to a standard score (SS) of 100, scaled score (ScS) of 10, T score of 50 and *Z*score of 0. Frequently used cut-offs for impairment are one standard deviation below the mean (SS = 85, ScS = 7, T = 40, *Z*= -1) and two standard deviations below the mean (SS = 70, ScS = 4, T = 30, *Z*= -2).

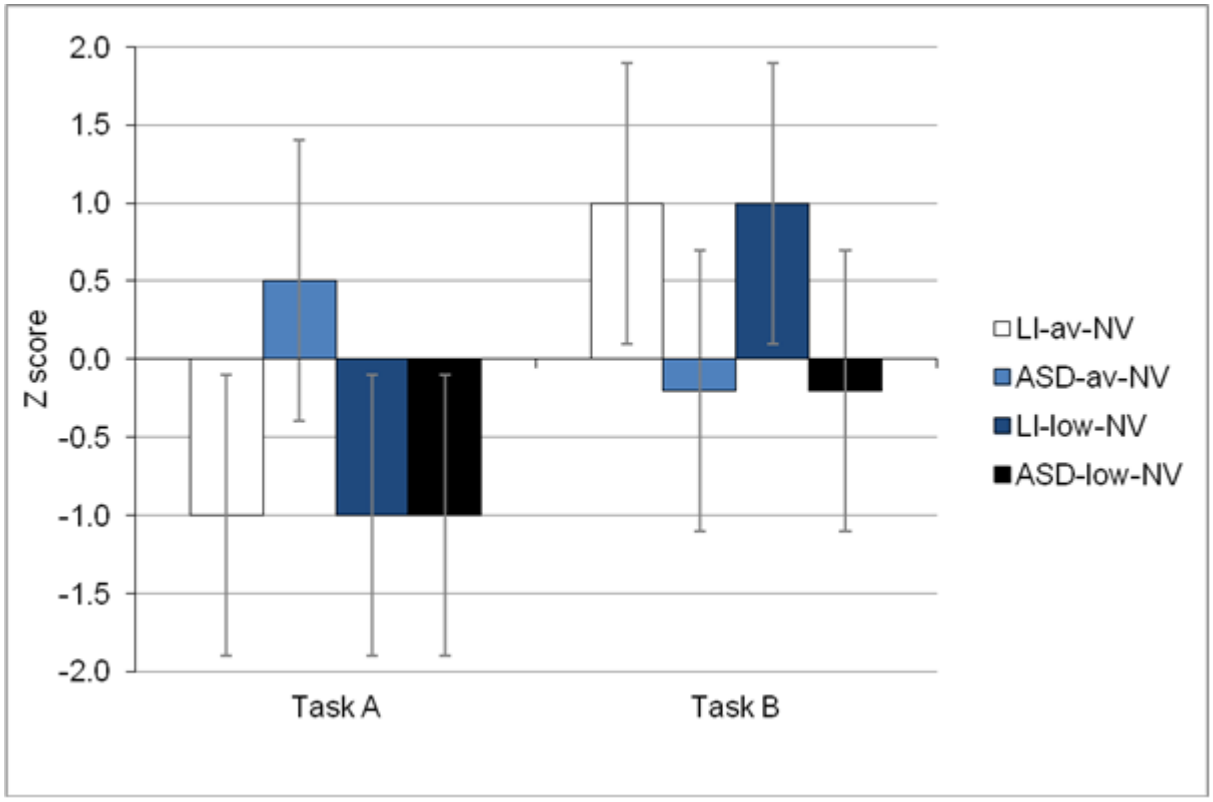

Figure 3.1. An example of a bar graph examining hypothetical performance on tasks A and B across cohorts

In what follows, we describe patterns of results across the dimensions sampled. Each section of the results provides a brief description of the measures used to capture the dimension under investigation. This is followed by graphs that highlight our most important findings (see Figure 3.1 for an example) with a brief description of relevant analyses. For reference, all means, standard deviations and statistical test results are presented in the appendices. Our typical approach is to begin by using analysis of variance (ANOVAs) with post-hoc analyses to identify significant cohort differences, followed by equivalent analyses to capture year group differences. Where data were available from two time points, these are then compared. Finally, in each section specific analyses are presented that aim to capture findings of practical and theoretical importance for each domain. All significance levels were set at .05 and Bonferroni corrections were used for post-hoc analyses and multiple correlations. We note where our approach to analysis deviates from this.

Each set of analyses aimed to maximise use of the data whilst also making sure that analyses were reliable. Wherever possible comparisons were conducted across four cohorts (LI-av-NV, ASD-av-NV, LI-low-NV and ASD-low-NV) capturing the effect of diagnostic group (LI vs. ASD) and level of nonverbal ability (average vs. low). However, in some cases data were not available for all pupils. This was particularly true for questionnaire data. Where an

analysis with four cohorts resulted in analysing a mean from fewer than 10 pupils, two cohorts were formed by collapsing over nonverbal ability; pupils with reported ASD (ASD cohort) and those with reported language difficulties (LI cohort). In these analyses we compare the two cohorts and control for nonverbal ability by including this variable (BAS-II matrices at screening) as a covariate in ANCOVAs.

For clarity and consistency across the whole results section, all graphs in these sections include means and standard deviations without including the covariate. In analyses investigating age effects (cross sectional differences between year groups), two approaches were taken. Depending on the number of pupils for whom data were available, pupils in the youngest year group (recruited while they were in Year 1) were either removed or two year groups were formed, a younger group (pupils recruited in Years 1 and 3) and an older group (pupils recruited in Years 5 and 7). These analyses allow us to compare profiles of pupils recruited to the sample at different ages with similar levels of need reported. These data have important implications for understanding profiles of need across development, and cross-sectional studies examining differences between LI, ASD and typical peers.

3.2. How did pupils perform on standardised measures of language?

Composite measures of expressive and receptive language from the Clinical Evaluation of Language Fundamentals (CELF-4 UK) were available at Time1 and from the Wechsler Individual Achievement Test (WIAT-II UK) at Time 2. Figure 3.2 provides mean *Z* scores and standard deviations for the four cohorts on these measures. As Figure 3.2 shows, all cohorts demonstrated depressed performance in oral language relative to the test norms. However, the ASD-av-NV cohort means were within the average range, albeit in the lower average range. Within cohorts there was significant variation in performance on all measures.

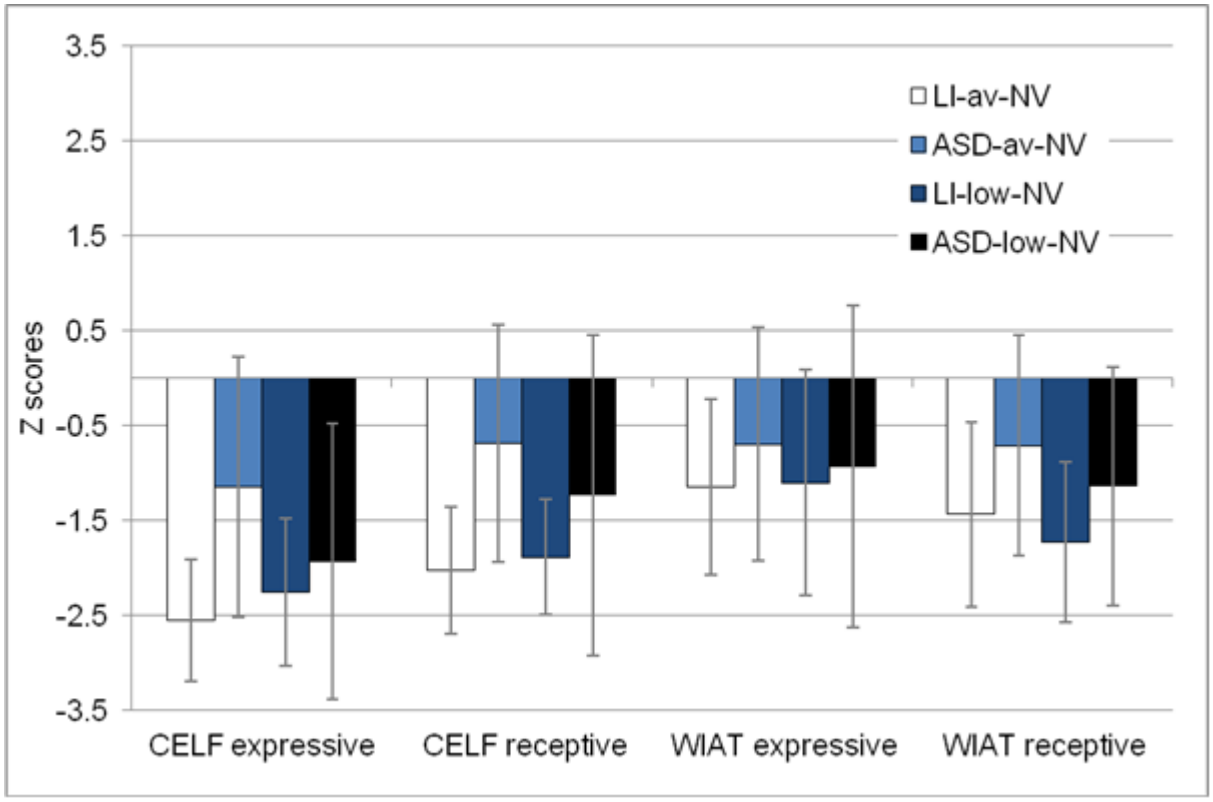

Figure 3.2. Performance (M±SD) on Receptive and Expressive language measures at Time 1 (CELF-4 UK) and Time 2 (WIAT-II UK)

There were significant language measure effects for CELF-4 UK expressive and receptive measures at Time 1 and an interaction with cohort. Performance on the CELF-4 UK receptive measure was significantly better than performance on the expressive measure. Separate analyses for CELF-4 UK expressive and receptive measures for the four cohorts confirmed this pattern for the receptive but not expressive measure. For the expressive measure the ASD-av-NV cohort performed significantly better than both LI cohorts who did not differ. Other cohort comparisons were not significant.

At Time 2 there was also a significant effect for type of test and an interaction with cohort. Performance on the WIAT-II UK listening comprehension was significantly poorer than performance on the WIAT-II UK oral expression measure. There was no statistically significant effect of cohort for the WIAT-II UK oral expression measure. For the WIAT-II UK receptive measure, there was a significant effect of cohort where the ASD-av-NV cohort performed significantly better than the two LI cohorts. Other cohort comparisons were not significant.

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To examine year group effects we considered pupils recruited in Years 3, 5 and 7. We examined the effect of primary need (LI vs. ASD) across the composite receptive and expressive measures, controlling for nonverbal ability. Means and standard deviations are presented in panels a and b of Figure 3.3. For the CELF-4 UK expressive measure there was a significant effect of year group and a significant interaction with cohort. For the LI cohort expressive performance was significantly better for the pupils recruited in Year 5 than Years 7 and 3. In contrast for the pupils with ASD, the Year 7 group performed significantly better than the Year 3 group.

There was also a significant interaction between year group and cohort for the receptive measure. For the LI cohort, performance in Year 7 was significantly worse than those in Year 3. In contrast, for the ASD cohort, there were no significant differences across the three year groups in receptive language. Overall pupils recruited with LI in secondary school were showing significantly more impaired profiles on measures of receptive language. In contrast, the measures taken at Time 2 showed no differences between year groups for either the receptive or expressive language measure.

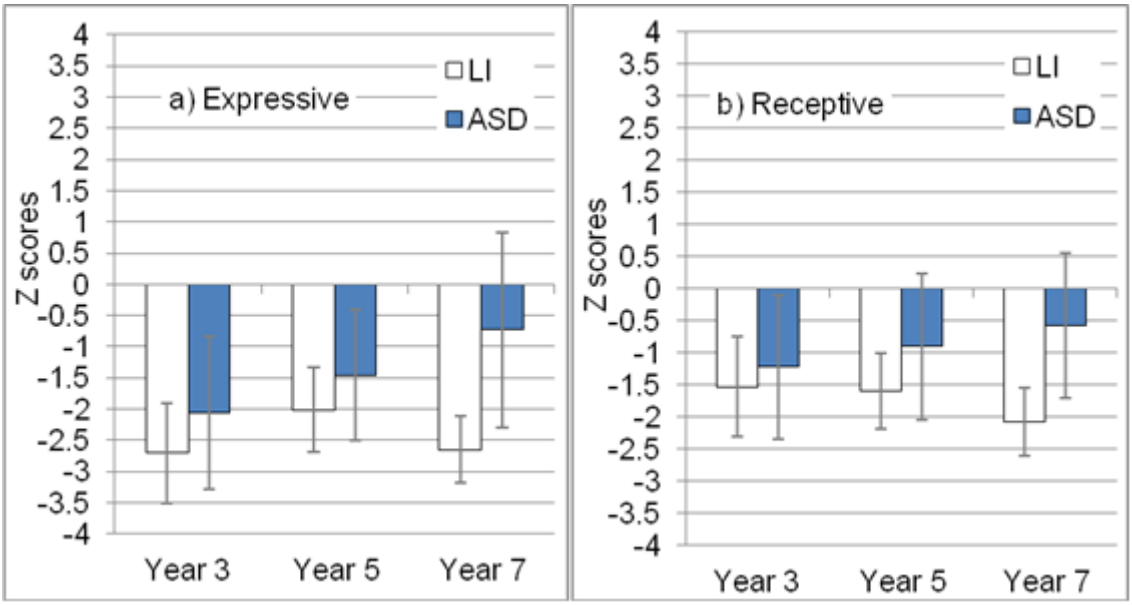

Figure 3.3. Scores (M±SD) on a) expressive and b) receptive language measures by year group at Time 1

3.2.1. Relationships between expressive and receptive language

As described above, at Time 1, performance on the expressive measure was poorer than on the receptive measures whereas the opposite pattern was observed at Time 2. Relationships

between expressive and receptive language were further explored by examining associations between measures within the LI and ASD cohorts.

We examined the relationships between the CELF-4 UK and WIAT-II UK language measures over time. This allowed us a) to establish the construct validity of the test measures across the two cohorts and b) to identify the most robust measures for including in subsequent statistical analyses. As Table 3.1 shows, the relationships between language measures varied according to cohort (LI vs. ASD). Pupils with ASD showed large and significant correlations between all language measures, both concurrently and over time. The correlations were smaller for pupils with language impairments; for these pupils the expressive language measure at Time 2 did not correlate either concurrently or over time with the other language measures. In subsequent analyses expressive and receptive measures from Time 1 (CELF-4 UK) are used.

Table 3.1. Correlations between receptive and expressive language measures for the LI cohort (below the diagonal) and the ASD cohort (above the diagonal)

	1	2	3	4
1.Expressive language (CELF-4 UK) T1		.80***	.62***	.58***
2.Receptive language (CELF-4 UK) T1	.37***		.80***	.70***
3.Expressive language (WIAT-II UK) T2	.10	.17		.58***
4.Receptive language (WIAT-II UK) T2	.48***	.38***	.14	

Notes: T1=Time 1; T2=Time 2; *** $p < .0001$

Figure 3.4 presents a scatterplot of the Time 1 receptive and expressive language measures for the ASD and LI cohorts. Figure 3.4 captures the differences between the two cohorts (LI and ASD) on the receptive and expressive language measures as well as the overlap between the cohorts. However, using a cutoff of -1.0 (*Z* score) to address scores within the average range and above (> -1.0) or below average (< -1.0). It can be seen that receptive vocabulary scores were within the average range for the majority of the ASD cohort (60%) but a small proportion of the LI cohort (22%). For a substantial proportion of the pupils with ASD (40%), expressive language was also within the average range (or even above average, > 1*SD*) but this occurred very infrequently for pupils in the LI cohort (4%). For both

receptive and expressive language, pupils with LI, who fall within the average range, have lower mean scores that those with ASD.

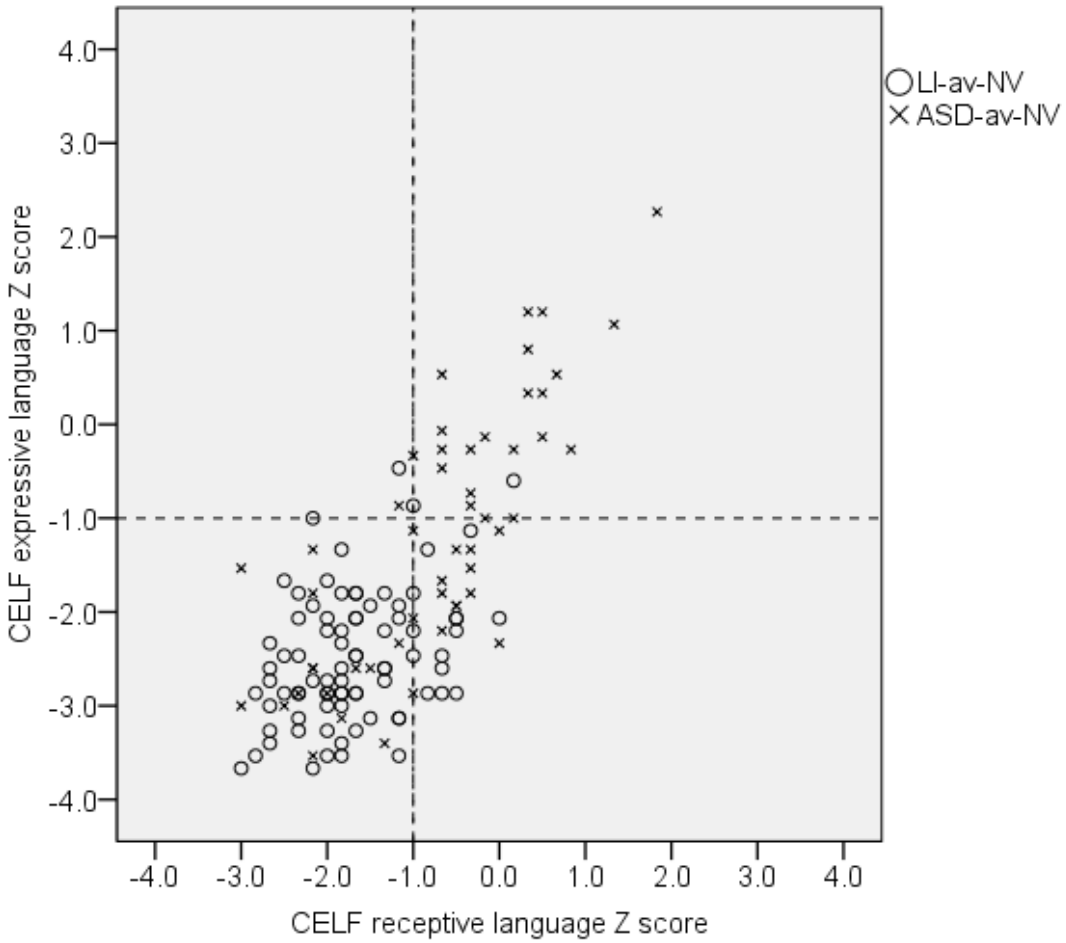

Figure 3.4. Relationship between CELF-4 UK receptive and expressive language scores

3.2.2. Subcomponents of the language system

Aspects of language were measured using the Phonological Assessment Battery (PHAB:phonology), Test of Reception for Grammar (TROG: receptive grammar) and British Picture Vocabulary Scale II (BPVSII: receptive vocabulary). Details of the tests and their psychometric properties can be found in Appendix 2, separate Technical Annex. Figure 3.5 provides means and standard deviations for the four cohorts on these subcomponent measures of the language system.

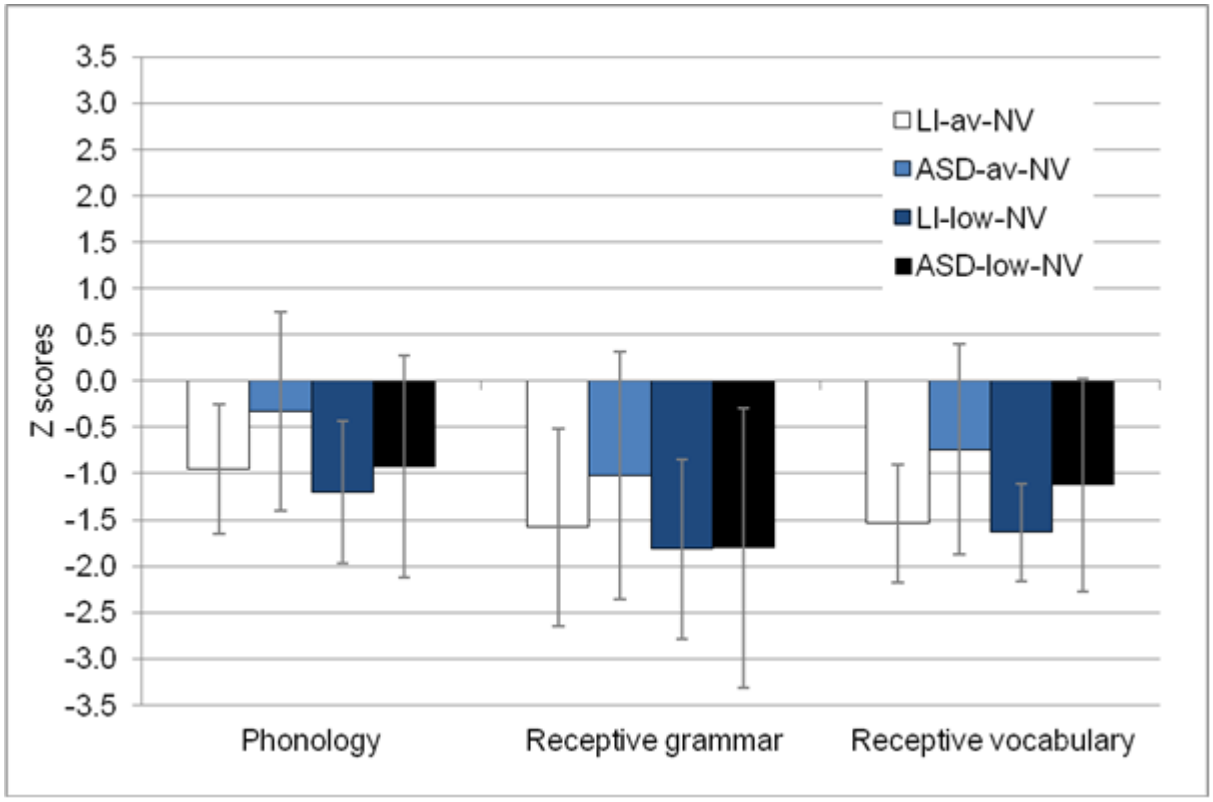

Figure 3.5. Scores (M±SD) on subcomponent measures of the language system.

As Figure 3.5 shows, cohort means were depressed relative to test norms but there was substantial variation within the cohorts on all measures, a pattern consistent with the receptive and expressive measures reported above. The ASD-av-NV cohort performed significantly better than both LI cohorts but did not differ from the ASD-low-NV cohort on any of these measures. The ASD-low-NV cohort did not differ significantly from the two language impaired cohorts on any measure. Although average scores for phonology were depressed, this dimension can be viewed as a relative strength across all cohorts and overall performance on this measure was significantly better than on the other two measures. There were no significant differences between year groups on any measure

. Receptive grammar and receptive vocabulary measures were repeated over time. There was no significant difference between performance at Time 1 and Time 2 on either of these measures, indicating stability on these measures for all cohorts.

3.2.3. Comparing structural and pragmatic language

Parent report on the Children's Communication Checklist – 2nd Edition (CCC-2) was available at Time 1 for 44 pupils with LI (45%) and 39 pupils with ASD (61%). This comprises 4 subscales that measure structural language abilities (Figure 3.6) and 6 subscales that measure pragmatic language abilities (Figure 3.7).

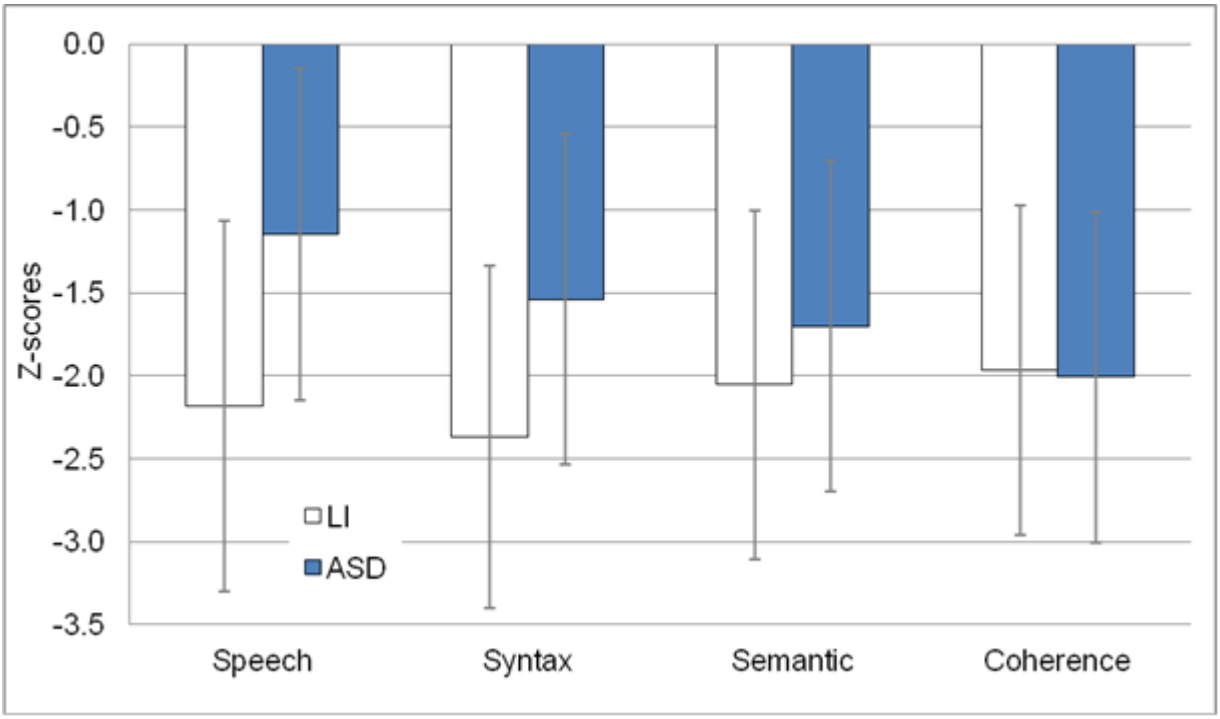

Figure 3.6. Performance (M±SD) scores on the structural language subscales of the CCC-2

As shown in Figure 3.6, and in line with the language measures reported above, both cohorts showed depressed scores on the structural language subscales compared to test norms and once again there was substantial variability in both cohorts. On the speech and syntax subscales the LI cohort scored significantly lower (showed more difficulties) than the ASD cohort but the cohorts did not differ on the semantic and coherence subscales.

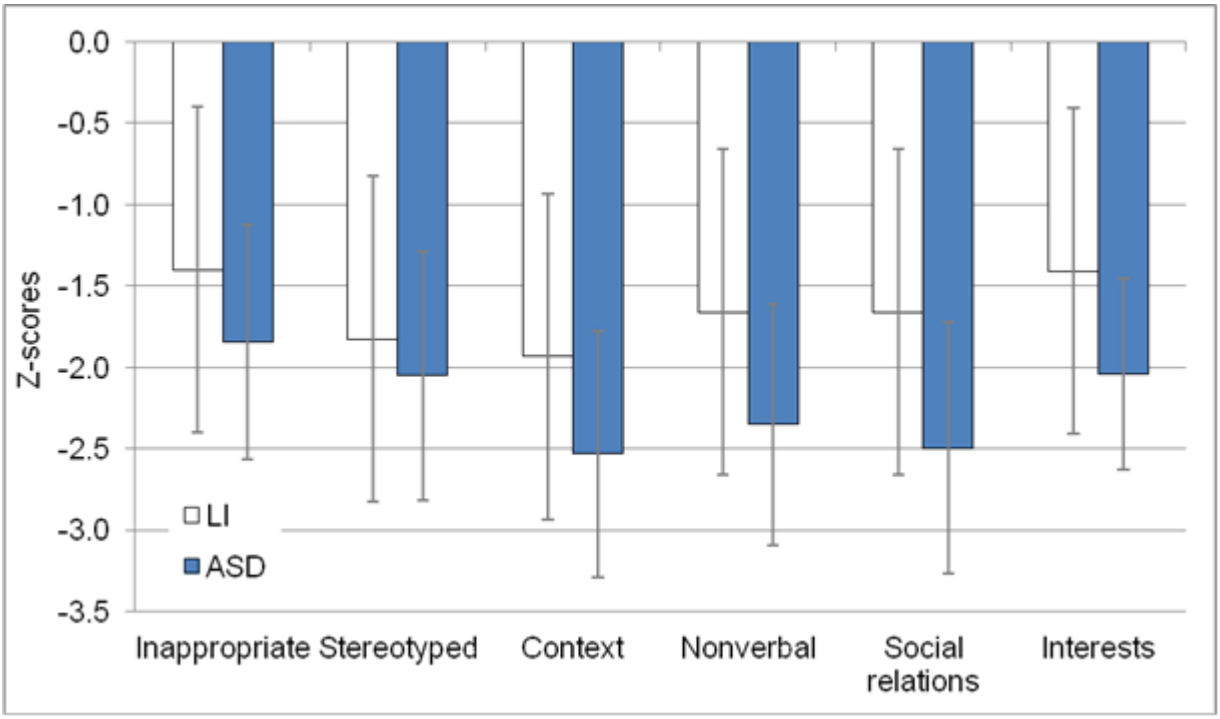

Figure 3.7. Performance (M±SD) scores on the pragmatic language subscales of the CCC-2

As shown in Figure 3.7, the pattern of results on the pragmatic language subscales differed from the structural language subscales. The ASD cohort had significantly lower scores (indicating more difficulties) than the LI cohort on five of the six subscales: inappropriate initiations, use of context, nonverbal communication, social relations and interests subscales. The two cohorts did not differ on the stereotyped language subscale.

The CCC-2 also produces two summary scores; the General Communication Composite score (GCC) (see Figure 3.8) and the social interaction deviance score (see Figure 3.9). The proportion of pupils within each cohort who fell into the bottom 10% and bottom 3% of the standardisation sample on the GCC are shown in Figure 3.8. This proportion did not differ between the LI and the ASD cohorts for the GCC with around two-thirds of both cohorts falling into the lowest 3% compared to the instrument norms. However, on the Social Interaction Deviance score (SID) a significantly higher proportion of the ASD cohort fell into the 'pragmatic language impairment' (PLI)/ASD range compared to the LI cohort (and none fell in the 'typical' SLI range), in keeping with their primary identified need (Figure 3.9).

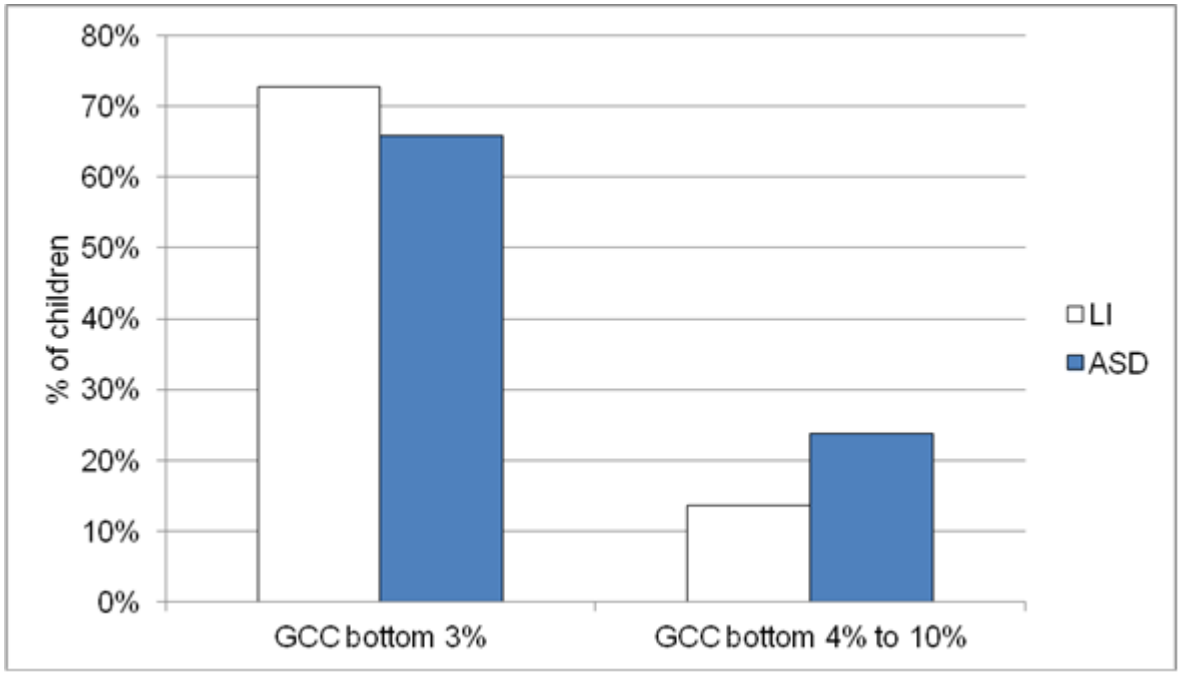

Figure 3.8. The proportion of each cohort according to the CCC-2 standardisation sample on the General Communication Composite

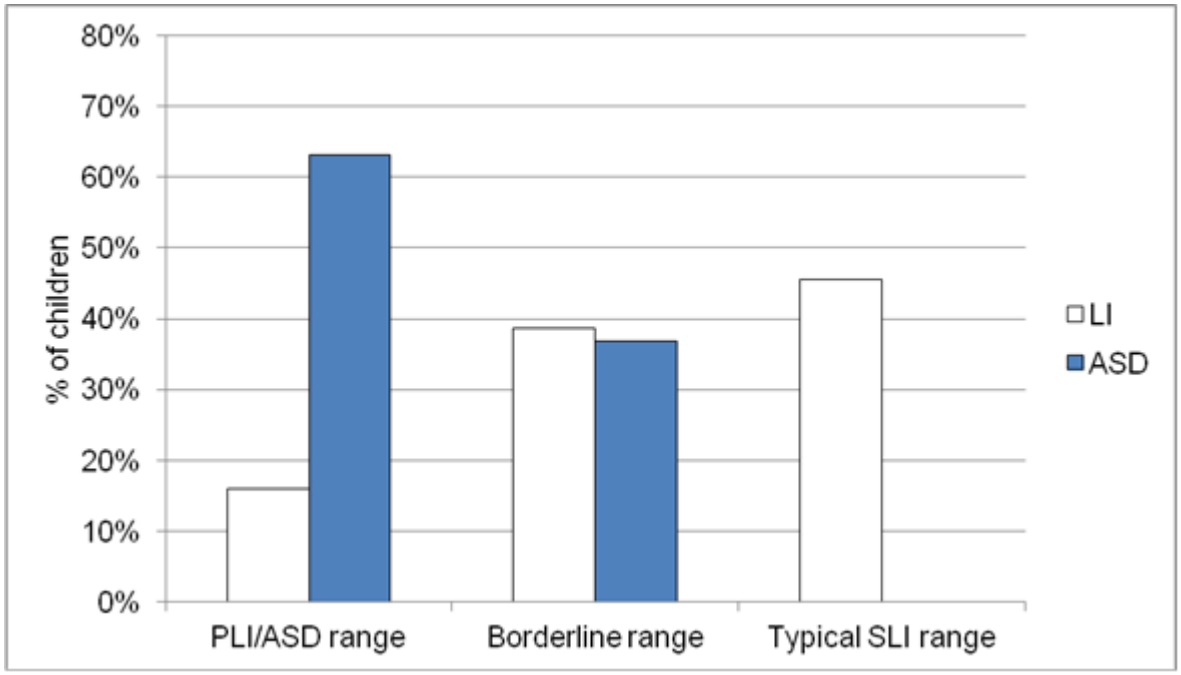

Figure 3.9. The proportion of each cohort falling in the typical SLI and pragmatic language impairment (PLI) /ASD range on the Social Interaction Deviance score

To explore age-related effects, data were analysed in the combined LI and combined ASD cohorts and also across two year groups (younger: combined Years 1 and 3 vs. older: combined Years 5 and 7). The year group scores on the structural language subscales of

the CCC-2 are shown in panels a and b of Figure 3.10. The pattern of LI vs. ASD cohort differences was largely as described above with the LI cohort showing more difficulty than the ASD cohort on the speech and the syntax subscales with no cohort differences on the semantic and coherence subscales. There was one significant effect for age with scores of both the LI and ASD cohorts being lower (indicating more difficulty) in the older compared to the younger year groups for the semantic subscale

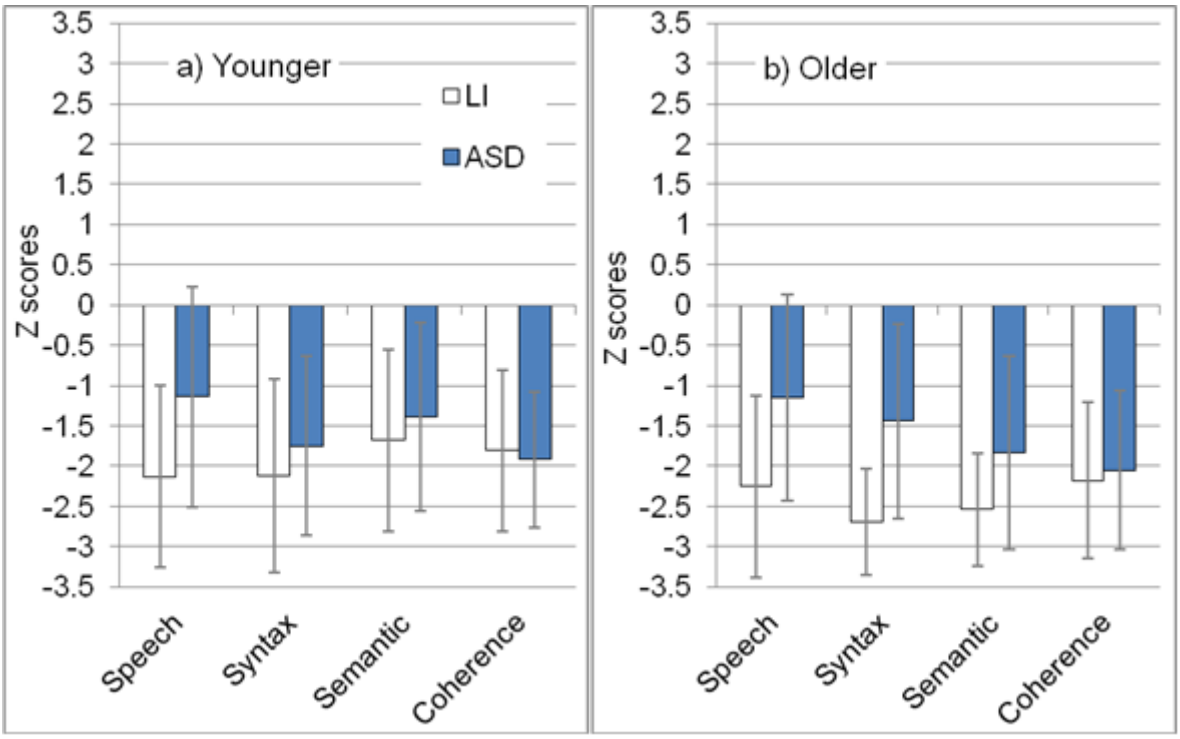

Figure 3.10. Performance (M±SD) year group profiles for a) younger and b) older pupils on the structural language subscales of the CCC-2 for the LI and ASD cohorts

In contrast, on the pragmatic language subscales of the CCC-2 (see panels a and b of Figure 3.11.) there were more widespread year group effects. As shown in Figure 3.11, scores were significantly lower (indicating more difficulties) for both cohorts on the inappropriate, stereotyped language, use of context, social relations and interests subscales in the older compared to the younger year groups, indicating that for both children with LI and children with ASD pragmatic language difficulties were more evident in the older pupils. Although these data are not longitudinal they are consistent with the notion that as children with LI and ASD progress through school their difficulties interacting with their peers and having fluid and reciprocal social interactions may increase. This should be further examined by longer-term follow-up of the present cohort.

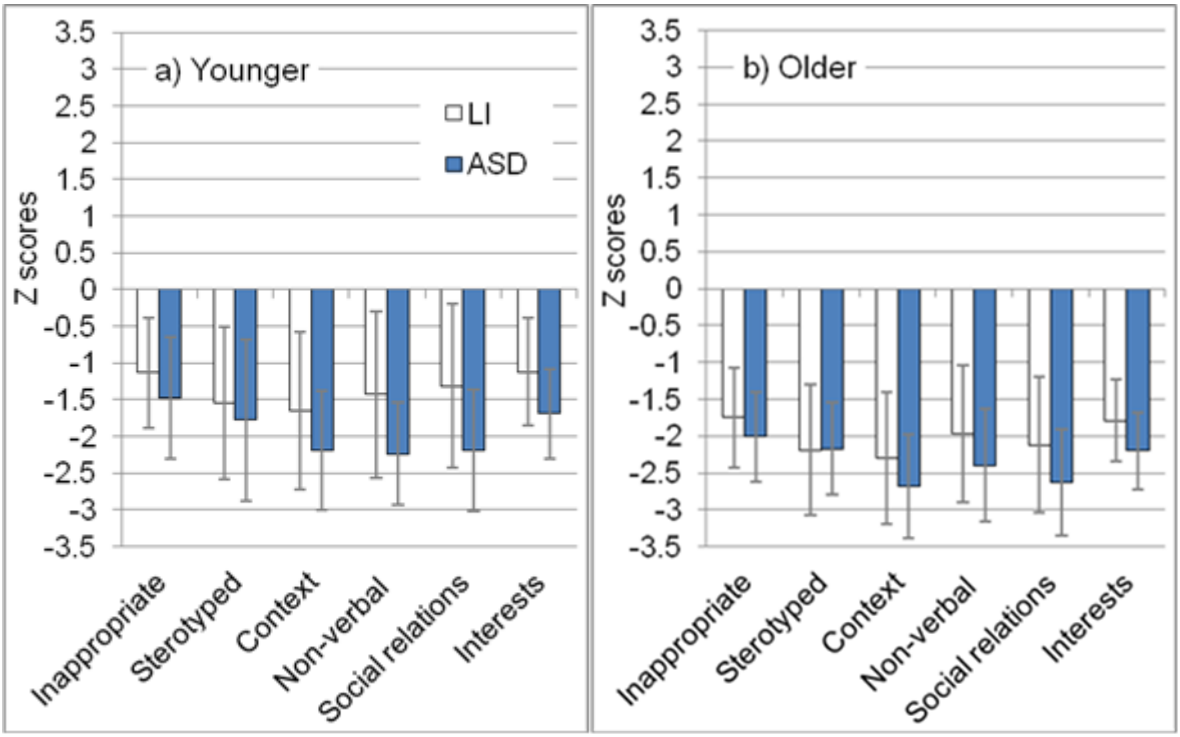

Figure 3.11. Performance (M±SD) year group profiles for a) younger pupils and b) older pupils on the pragmatic language subscales of the CCC-2 for the LI and ASD cohorts

Box 3.1. Summary of language learning needs

- Pupils were assessed on both composite language measures (CELF-4 UK- 4 UK and WIAT-II UK) and measures that tapped subcomponents of the language system (phonology, vocabulary and grammar).
- Both LI and ASD cohorts exhibited depressed language scores but pupils with ASD-av-NV performed consistently better on all measures apart from the WIAT-II UK expressive measure.
- The WIAT-II UK expressive measure was not sensitive to cohort differences and, unlike other measures, means were within the average range.
- Correlations between expressive and receptive language measures were larger for the ASD cohort and this may reflect the greater range in their scores.
- Repeated measures were available for the tests examining vocabulary and grammar; here we found stability over time.
- Across a number of measures, pupils recruited from older year groups had significantly poorer scores than pupils recruited from younger year groups.
- Measures of pragmatic language difficulties revealed different patterns than those of structural language. For pragmatic communication dimensions pupils with ASD showed greater difficulties: specifically, pupils with ASD showed greater difficulties with social interaction on the CCC.

3.3. How did pupils perform on cognitive and memory measures?

Pupils completed a number of measures designed to examine nonverbal cognitive ability, short-term memory and working memory at Time 1. In addition, we repeated the nonverbal measure used to identify pupils during the screening phase to examine patterns of change.

3.3.1. Nonverbal ability

We used the matrix reasoning and vocabulary subtests of the Wechsler Abbreviated Scale of Intelligence (WASI) to confirm the levels of nonverbal ability from the screening phase. We could also compare the nonverbal subscale with the verbal scale on measures standardised on the same population to confirm the profile of the pupils' needs. Figure 3.12 provides mean *Z* scores and standard deviations for the cohorts.

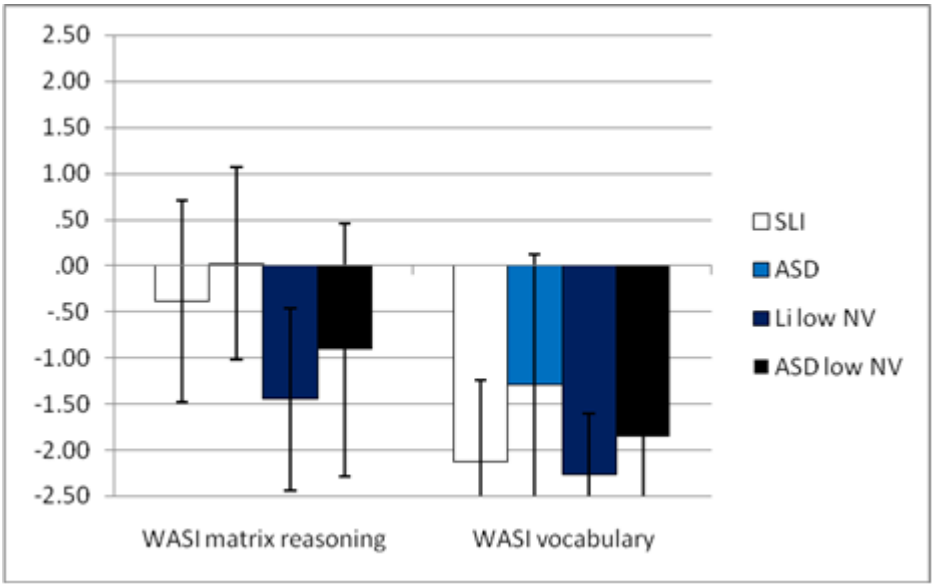

Figure 3.12. Performance (M±SD) on WASI matrix reasoning and WASI vocabulary

The cohorts differed significantly on both the matrix reasoning scale and the vocabulary scale. For matrix reasoning, the performance of the ASD-av-NV and LI-av-NV cohorts did not differ and cohort means were within the average range. Performance of these cohorts was significantly higher than the LI-low-NV cohort but not the ASD-low-NV cohort. For the vocabulary measure, the ASD-av-NV cohort significantly outperformed both LI cohorts. The ASD-low-NV cohort obtained an intermediate mean vocabulary score that did not differ significantly from the other three cohorts. There was no significant effect of year group. For all cohorts, performance was significantly worse on the vocabulary than matrix reasoning measure.

In sum, the WASI confirms the average nonverbal performance of the LI-av-NV and ASD-av-NV cohorts and the low nonverbal performance of the LI-low-NV and ASD-low-NV cohorts. In addition, the data confirm that verbal ability was a greater area of weakness for all cohorts than nonverbal ability.

Since both nonverbal and verbal scales from the WASI are standardised on the same population we considered the spread of the pupils' scores on these measures. The correlation between the two measures was significant (r = .47) and the pattern was similar across the four cohorts. As Figure 3.13 shows, there was also significant overlap between the cohorts' performance on all measures. There were four pupils from the whole sample who showed strengths, that is performance above a Z score of 1, on both measures and all of these pupils came from the ASD-av-NV cohort.

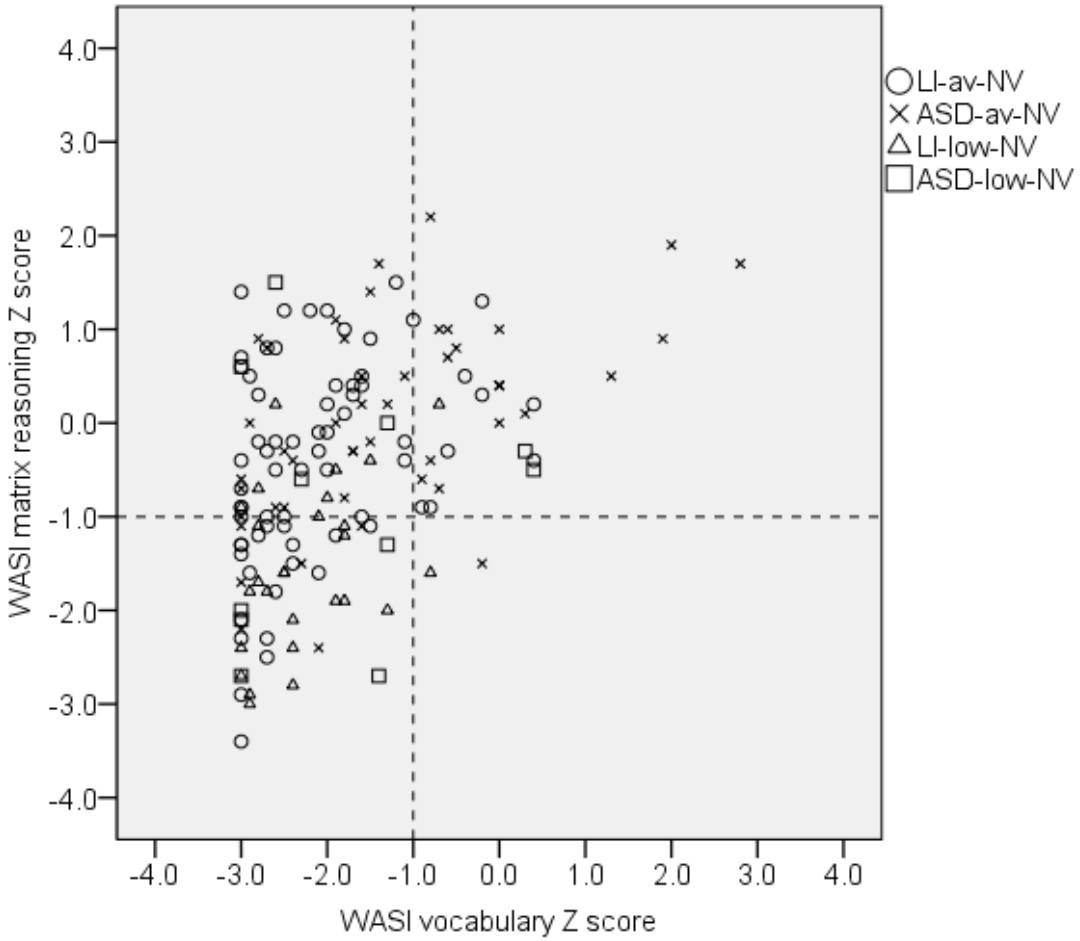

Figure 3.13. Relationship between WASI matrix reasoning and WASI vocabulary

The British Ability Scales (BAS-II) matrices subtest was completed in the screening phase (see Method Section X). Previous studies have indicated a decline in nonverbal ability over time in pupils with a history of language impairments (Botting, 2005). Repeating the BAS-II matrices subtest at Time 2 allowed us to examine changes over time (on average 19 months). The significant differences between the low nonverbal cohorts and the LI-av-NV and ASD-av-NV cohorts, which characterised the cohorts at screening, were evident on repeat testing. However, as Figure 3.14 shows, there was a significant change over time in nonverbal ability as measured by the BAS-II matrices and this change varied by cohort. While there was a significant relative improvement in the two low nonverbal ability cohorts both the ASD-av-NV and LI-av-NV cohort showed small decreases (significant for the ASD-av-NV only). These changes may be interpreted as indicating regression to the mean, that is measurements over time will tend to be closer to the average at the second assessment point; and point to the overall stability of performance on this measure over time.

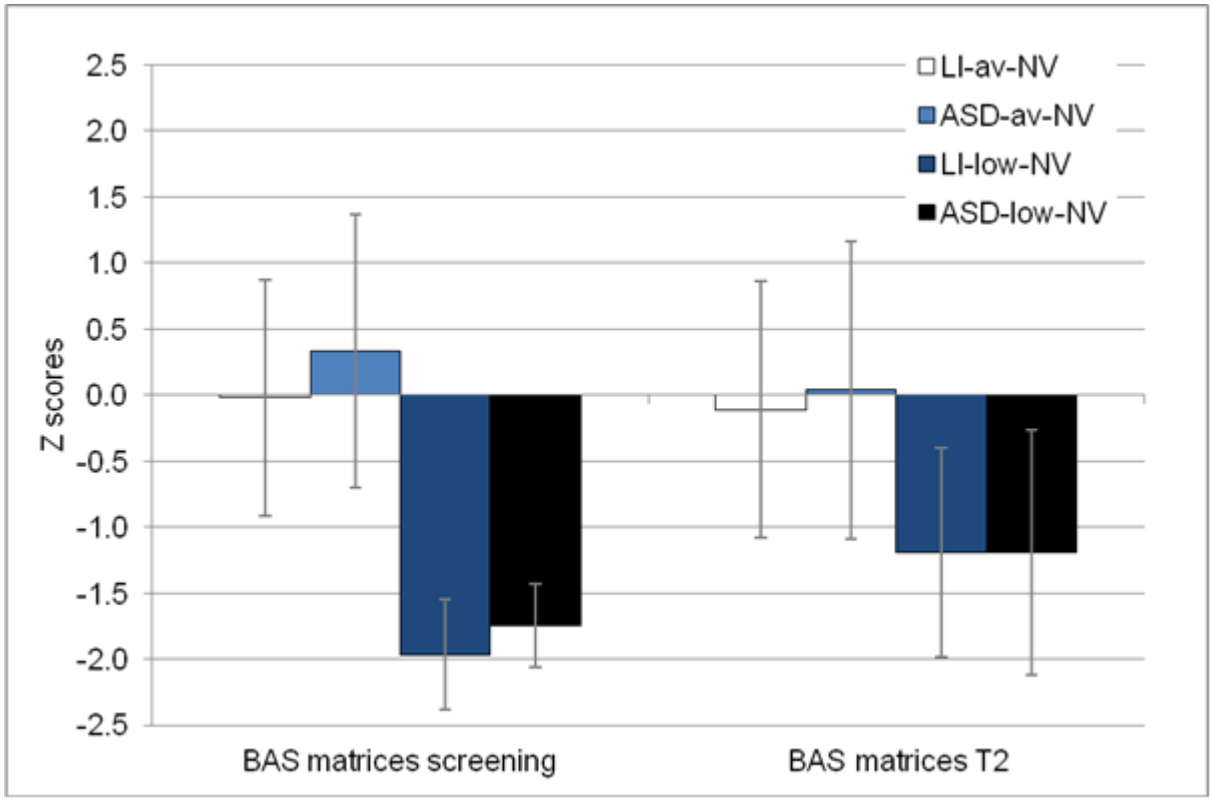

Figure 3.14. Performance on the BAS-II matrices scale at screening and T2

3.3.2. Memory

We assessed pupils' performance on five subscales from the Automated Working Memory Assessment (AWMA; Alloway, 2007). These subscales were administered at Time 1 to assess both short-term memory (storage) and working memory (storage and processing) in visuo-spatial and verbal domains. Dot matrix provides a measure of visuo-spatial short-term memory, spatial recall of visuo-spatial working memory, spatial recall processing of visuo-spatial working memory, digit recall of verbal short-term memory and backwards digit recall of verbal working memory. Figure 3.15 (panels a and b) provide mean *Z* scores and standard deviations for the four cohorts on subscales. As the figure shows, there was considerable variation within and between cohorts on all measures, but in most cases mean scores were within the (low) average range.

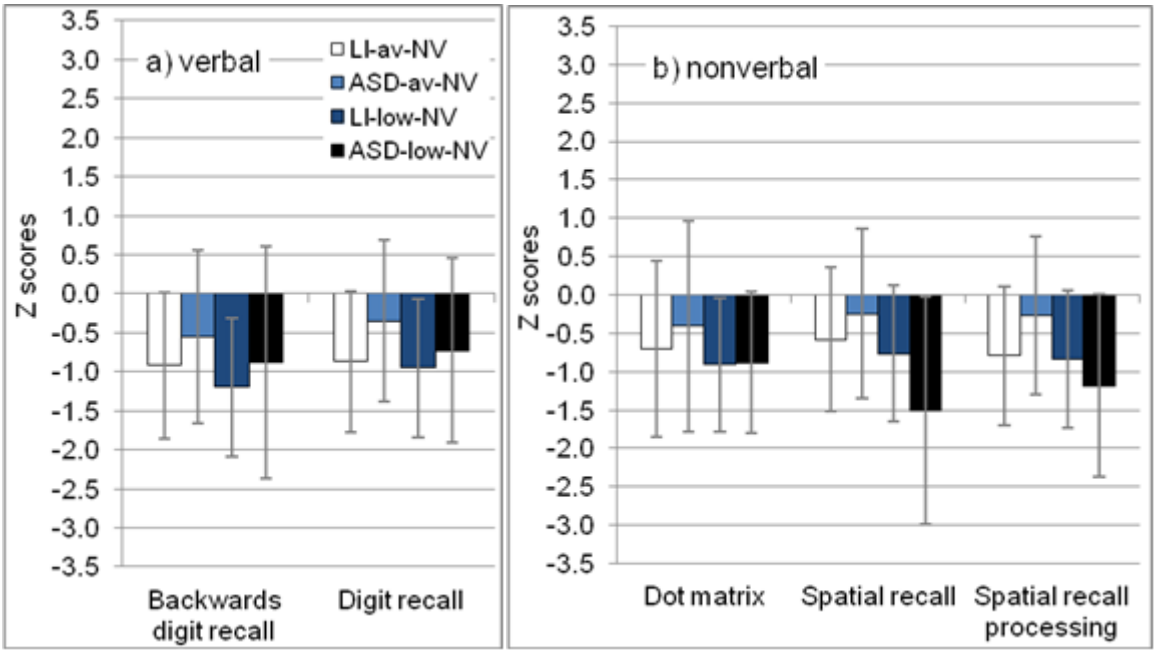

Figure 3.15. Performance on the working memory subscales a) verbal and b) nonverbal

The cohorts did not differ significantly on their dot matrix score. For all other measures, there were significant cohort effects. However, post-hoc testing revealed only two specific cohort differences: for digit recall, the ASD-av-NV cohort performed significantly better than the LI-av-NV cohort and there was a trend for a significant difference between the ASD-av-NV cohort and the ASD-low-NV cohort (p = .059). For spatial recall the ASD-av-NV cohort performed significantly better than the ASD-low-NV cohort. There were no other significant differences between the cohorts. Across the measures there were no year group effects on test scores. Given the pupils' difficulties on the language measures we had predicted that pupils would have greater difficulty with tasks in the verbal domain; this prediction was not upheld. There were no significant differences across the five memory measures and no interaction with cohort.

Box 3.2. Summary for cognitive and memory measures

- A standardised assessment of nonverbal ability was used to classify pupils into the four cohorts. We confirmed nonverbal ability status (average vs. low) using a second measure.
- We also demonstrated that for our sample (both LI and ASD cohorts), there were significant differences between indices of verbal and nonverbal ability; pupils showed poorer scores on the verbal than nonverbal domain.
- There were small but nonsignificant changes over time on the repeated nonverbal ability measure where the performance of pupils with average nonverbal ability decreased and those with low nonverbal ability improved. These changes are likely to reflect regression to the mean.
- Performance was depressed on verbal and nonverbal measures of memory and performance was equivalent across these domains.
- The ASD-av-NV cohort performed significantly better than the LI-av-NV cohort on the digit recall task (verbal short-term memory), and better than the ASD-low-NV cohort on the spatial recall task (nonverbal short-term memory). Otherwise there were no significant differences between the cohorts.
- Given that we found year group differences on some language measures, we anticipated that there may be differences between year groups on verbal memory measures. However, this hypothesis was not borne out.

3.4. How did pupils perform on literacy assessments?

3.4.1. Reading

Pupils completed the Single Word Reading Test (SWRT), Test of Word Reading Efficiency (TOWRE) and York Assessment of Reading for Comprehension (YARC) as measures of reading at Time 1. The SWRT and YARC were repeated at Time 2. These tasks provide measures of word reading accuracy (SWRT), word and nonword reading efficiency (TOWRE) and reading comprehension (YARC). Figure 3.16 provides mean *Z* scores and standard deviations for the four cohorts on the measures collected at Time 1.

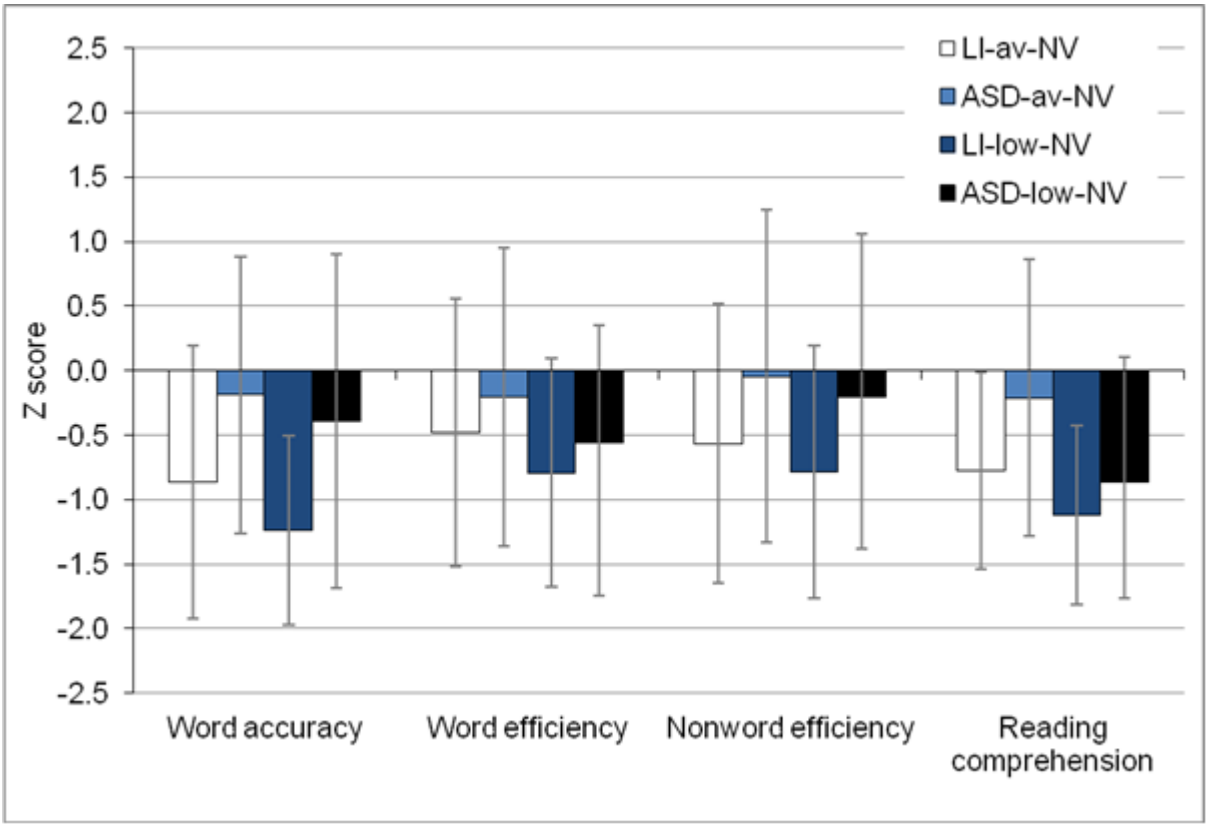

Figure 3.16. Performance (M±SD) on reading measures at Time 1

As Figure 3.16 shows, cohort means were either in the low average range or below the average range. There was also great variation between and within cohorts. Cohort differences were significant for word reading accuracy, nonword reading efficiency and reading comprehension measures. For nonword reading efficiency, the cohort difference reflected a trend (p = .06) for the ASD-av-NV cohort to outperform the LI-low-NV cohort (all other cohort differences were not significant). For the word reading accuracy and reading comprehension tasks, the ASD-av-NV cohort showed a significantly higher mean score than the two language impaired cohort s (LI-av-NV and LI-low-NV) while the ASD-low-NV cohort obtained an intermediate mean score that did not differ significantly from the other three cohorts. There was no effect of cohort on word reading efficiency.

The SWRT and YARC measures of word reading accuracy and reading comprehension were administered at two time points allowing us to explore changes over time. Analyses were conducted on two cohorts (ASD vs. LI) and controlled for nonverbal ability (ANCOVA). Word reading accuracy *Z* scores at Time 1 and Time 2 were equivalent. However, for reading comprehension there was a significant effect of time on *Z* scores such that pupils were relatively more impaired at Time 2 than at Time 1. This effect was consistent across

ASD and LI cohorts. Performance on the reading comprehension measure at Time 1 and Time 2 are presented in Figure 3.17.

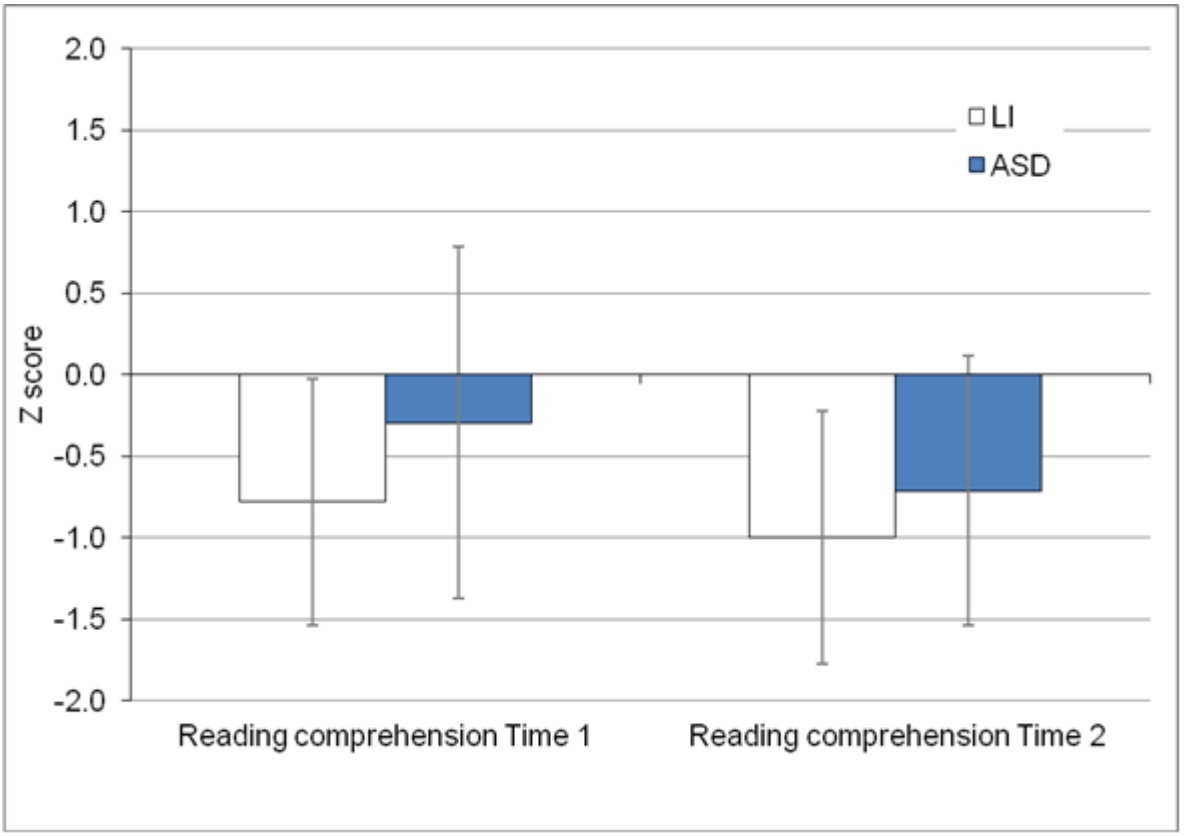

Figure 3.17. Performance (M±SD) on the reading comprehension task at Time 1 and Time 2

To examine age-related effects we analysed data from pupils recruited in Years 3, 5 and 7. Pupils recruited in Year 1 were removed as the number of pupils with ASD in this year group was small. We examined the effect of primary need (LI vs. ASD) across reading measures, controlling for nonverbal ability. Performance did not vary significantly by year group on word reading accuracy (Time 1 and 2), word reading efficiency or nonword reading efficiency tasks. For reading comprehension, there was an effect of year group at Time 1 but not at Time 2. At Time 1, younger pupils were significantly more impaired than older pupils. This effect was consistent across pupils with LI and ASD. Figure 3.18 shows performance (mean *Z* scores and standard deviations) at Time 1 on the reading comprehension scores across the three year groups.

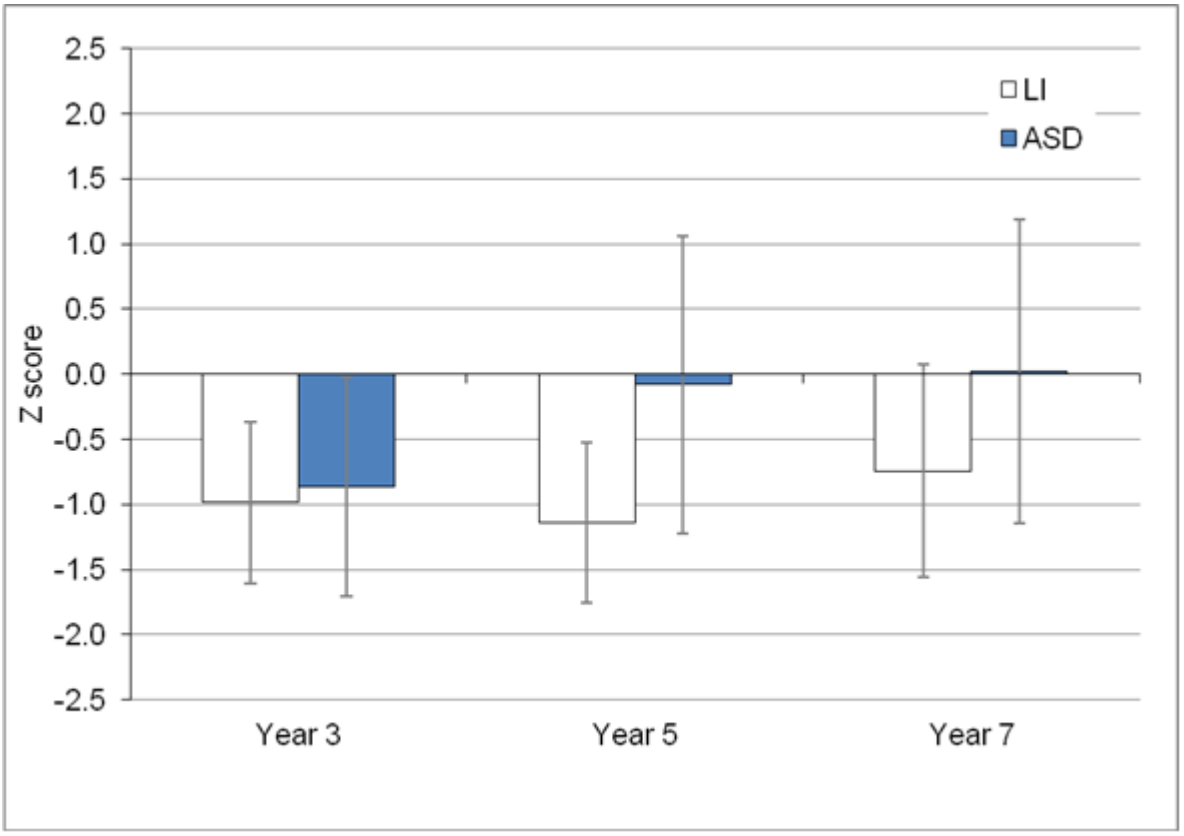

Figure 3.18. Performance (M±SD) on the reading comprehension task at Time 1 across year groups

In studies of reading in ASD, a discrepancy between word reading and reading comprehension is often reported such that reading comprehension scores are lower than word reading scores (e.g., Jones et al., 2009; Nation, Clarke, Wright, & Williams, 2006). To explore whether this discrepancy could be observed in our data, two ANOVAs were conducted with measure (word recognition vs. reading comprehension) and cohort (LI-av-NV vs. ASD-av-NV vs. LI-low-NV vs. ASD-low-NV) as independent samples factors, one for Time 1 data and one for Time 2 data. At both time points, there were main effects of measure, with reading comprehension being relatively more impaired than word recognition. At Time 1, this pattern of results was consistent across cohorts. At Time 2 however, the effect of measure varied by cohort such that a significant discrepancy between word recognition and reading comprehension was observed for the ASD cohorts but not for the LI cohorts.

Figure 3.19 presents a scatterplot that further probes the relationship between word recognition and reading comprehension in the four cohorts, indicating that despite the discrepancy described above, performance on the two measures is highly correlated (Time 1 $r = .56$, $p < .001$; Time 2 $r = .60$, $p < .001$). Time 1 data are presented in Figure 3.19, but

Time 2 data showed an equivalent pattern. Figure 3.19 also shows that on both word reading and reading comprehension, there is much variation within cohorts and there is a large degree of overlap between the cohorts. This demonstrates how cohort means such as those depicted in Figure 3.19 can mask a large degree of overlap between the two cohorts.

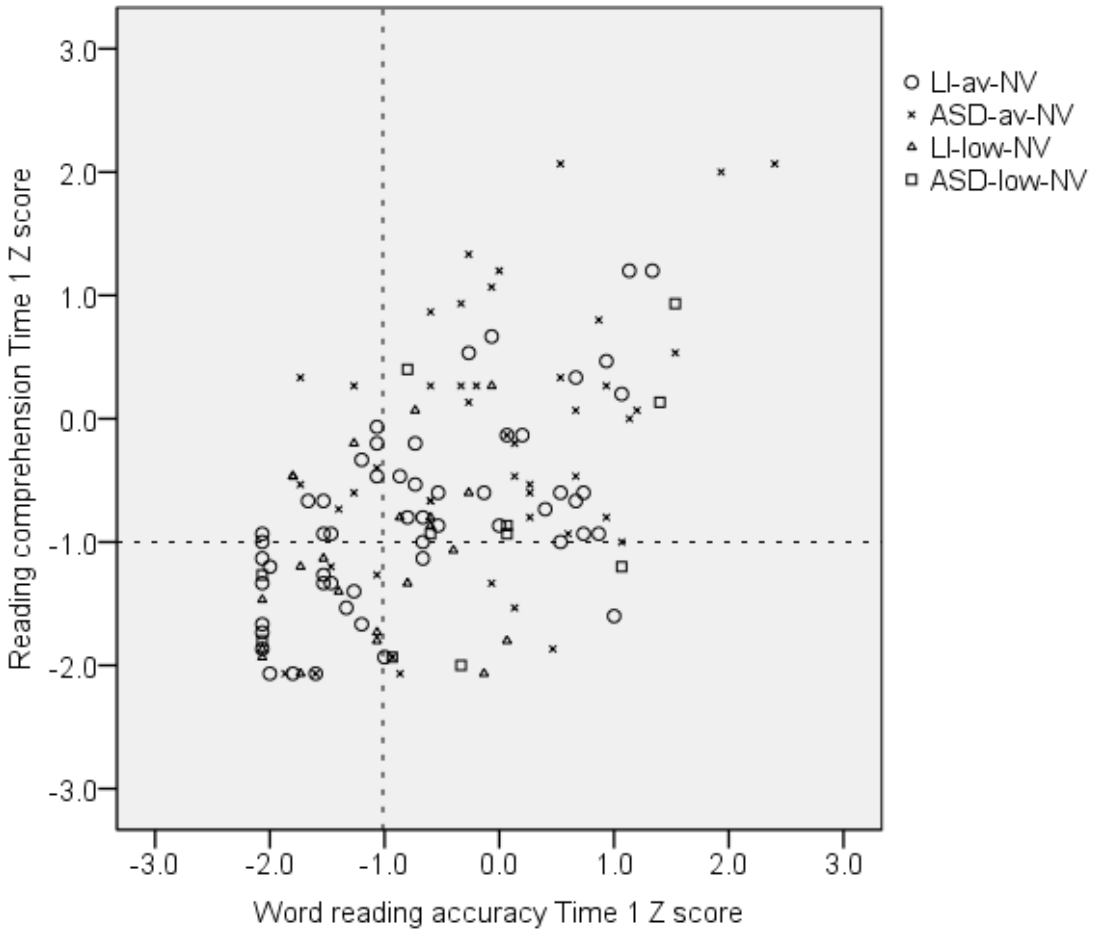

Figure 3.19. Scatterplot of the relationship between word reading accuracy and reading comprehension by cohort

3.4.2. Writing

Three aspects of writing were explored; spelling, handwriting fluency and composition. Spelling and handwriting fluency were assessed using standardised tests; the single word spelling subtest from the British Ability Scales II was administered at Time 1 and the alphabet writing subtest from the Detailed Assessment of Speed of Handwriting (DASH) was administered at Time 2. Composition was assessed at Time 1 and Time 2 using a five minute narrative writing task. Figures 3.20 and 3.21 provide means and standard deviations for the four cohorts on spelling, writing fluency and composition measures.

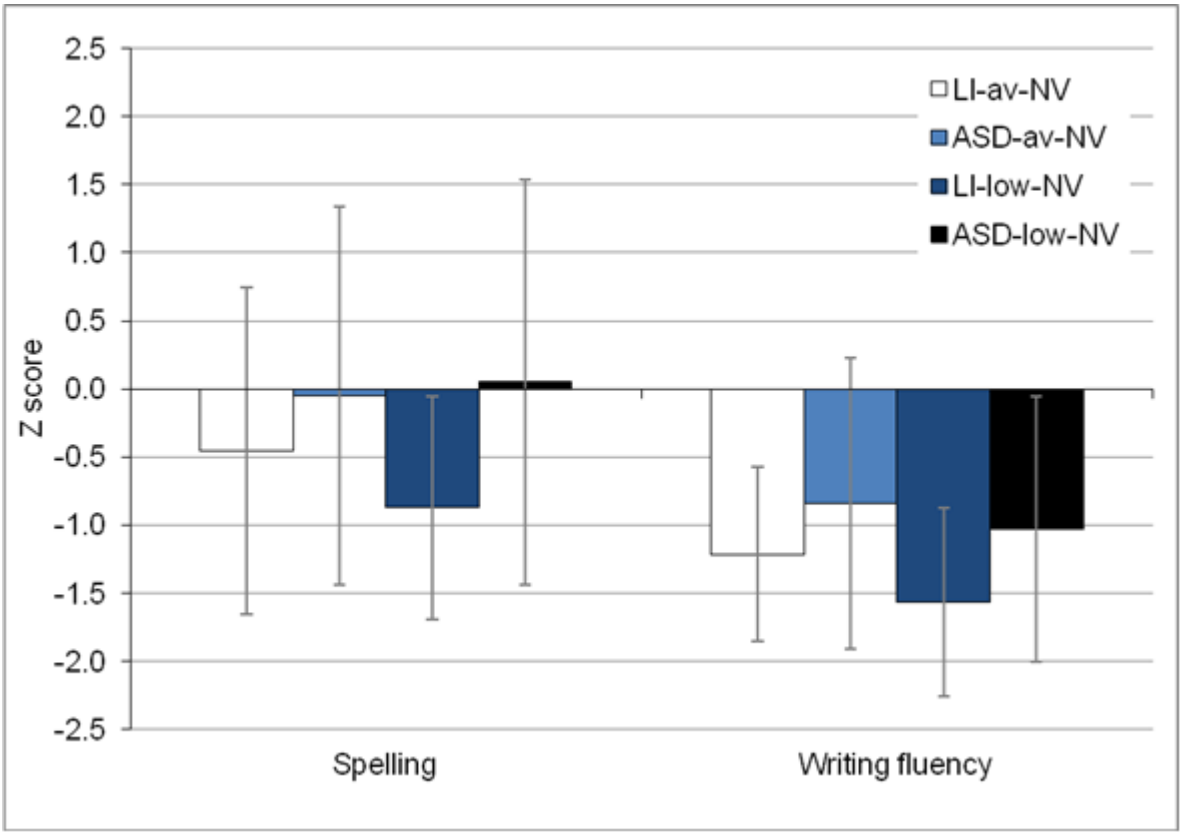

Figure 3.20. Performance (M±SD) on spelling and writing fluency tasks

Figure 3.20 shows mean *Z* scores and standard deviations on spelling and writing fluency tasks. There was much variation between and within cohorts on these measures. Mean spelling scores for the LI cohorts were depressed relative to the test mean whereas the two ASD cohorts obtained means that were approximately average. The only significant cohort difference in spelling performance was between the ASD-av-NV cohort and the LI-low-NV cohort, with the ASD-av-NV cohort outperforming the LI-low-NV cohort. For writing fluency, all cohorts showed depressed performance, with cohort means substantially below average. Again, the only significant cohort difference reflected performance in the ASD-av-NV cohort that was significantly higher than performance in the LI-low-NV cohort. There was no effect of year group on spelling or writing fluency *Z* scores.

Written texts were produced at Time 1 and Time 2 and were scored for number of words written, number of words spelled correctly and number of correct word sequences. Means for these measures are depicted in Figure 3.21. Normative data are not available for this task therefore means reflect raw scores. A substantial portion of the sample failed to produce a written text (25% at Time 1, 23% at Time 2); in most cases this was due either to unwillingness to complete the task or lack of understanding of task demands. Pupils who did not produce written texts were younger. Controlling for age pupils who did not produce

written texts had lower receptive and expressive language scores and higher SRS scores than those who did produce written text. Cohorts were collapsed to form LI and ASD cohorts and analyses controlled for nonverbal ability.

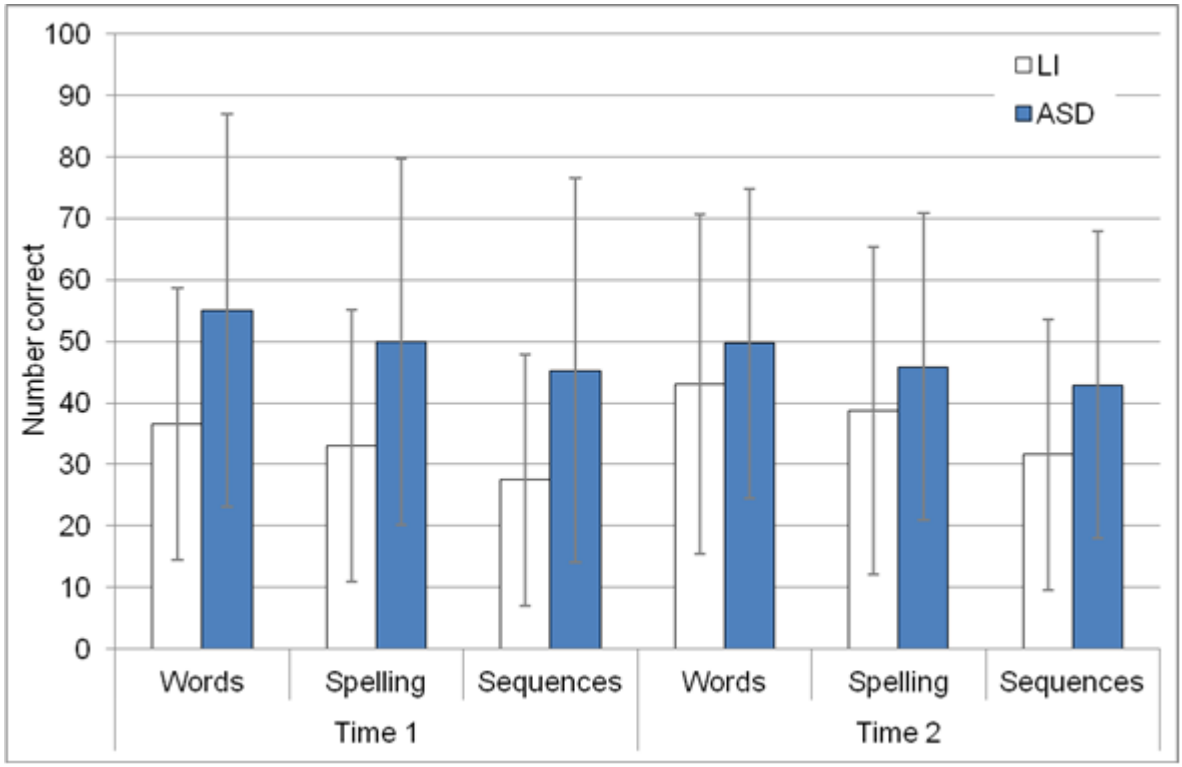

Figure 3.21. Performance (M±SD) on the composition task at Time 1 and Time 2

As Figure 3.21 shows, writing performance within and across cohorts was very variable. Pupils produced a greater number of words than words spelled correctly, which in turn was greater than the number of correct word sequences. The difference between words and spelling scores indexes spelling impairments (see Figure 3.14 above) and the difference between words/spelling and sequences scores reflects difficulties in producing coherent written text.

A number of interesting cohort differences were also apparent. At Time 1, the ASD cohort obtained significantly higher scores than the LI cohort across words, spelling and word sequences measures, indicating that pupils with ASD produce longer and more accurate written texts. At Time 2, the pattern was different. The ASD cohort continued to produce a significantly higher number of correct word sequences. However, cohorts no longer differed in terms of the number of words produced or the number of words spelled correctly. This reflected a slight increase in scores for the LI cohort accompanied by a slight decrease in scores for the ASD cohort.

To examine age-related effects we limited analyses to pupils recruited in Years 3, 5 and 7. We examined the effect of primary need (LI vs. ASD) across writing measures, controlling for nonverbal ability. Note that in contrast to the majority of analyses presented in this report, raw scores were analysed for the composition task. Therefore, we would expect to see age-related differences. For all composition measures there were significant age-related differences such that older pupils produced longer and more correct texts (see Appendix 9, separate Technical Annex for more details).

3.4.3. Novel word learning

To probe learning, pupils completed an experiment in which they were taught meanings for novel words. Due to time constraints, the word learning experiment was presented to a subgroup of pupils, those in the LI-av-NV and ASD-av-NV cohorts and those recruited from Years 3, 5 and 7. Seven of these pupils did not complete the task due to unwillingness, school absence or computer error. For the resulting sample (44 pupils with LI-av-NV and 39 with ASD-av-NV), there was a significant difference between cohorts on nonverbal ability but not for year group. Nonverbal ability was included as a covariate in analyses. In the word learning task pupils were taught the meaning of 12 new words over three learning trials. Mean proportion accuracy and standard deviation in each learning trial are presented in Figure 3.22.

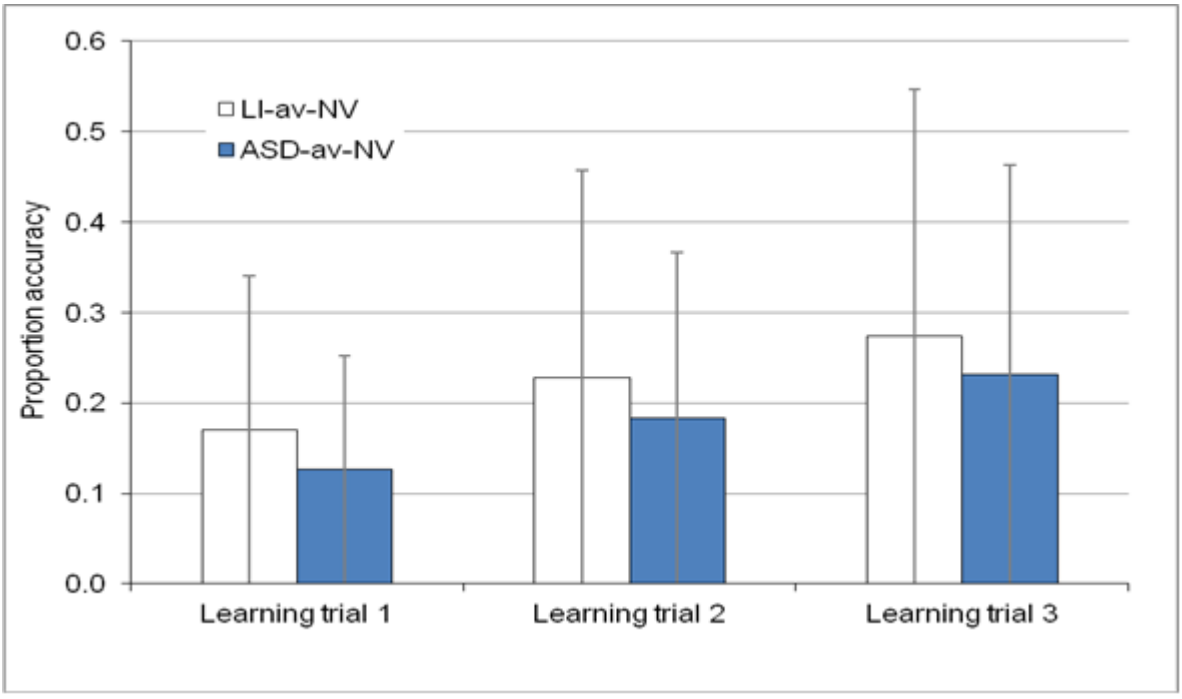

Figure 3.22. Performance (M±SD) on the word learning experiment

Figure 3.22 indicates that a substantial amount of learning occurred, such that performance improved steadily across trials. However, both cohorts found this learning task difficult, demonstrating knowledge of approximately one quarter of the new words by the end of training (learning trial 3). An ANOVA indicated that cohorts did not differ significantly. Performance did improve significantly at each trial and this effect was consistent across cohorts.

Box 3.3. Literacy summary

- Performance across literacy measures indicated that in most cases pupils with LI had a greater degree of difficulty than pupils with ASD. However, the scatterplot of word recognition against reading comprehension indicates that differences in cohort means can mask overlap in LI and ASD distributions.
- In longitudinal analyses, word recognition scores were stable but reading comprehension *Z* scores were lower at Time 2 than at Time 1. This effect was consistent across ASD and LI cohorts and indicates that reading comprehension difficulties were worsening over time in these pupils with language, social and communication difficulties and that they were falling further behind their peers.
- In line with previous research (Jones et al., 2009; Nation et al., 2006) a discrepancy between reading skills such that reading comprehension was relatively more impaired than word recognition was evident in the ASD cohort at Time 1 and Time 2. This discrepancy was also evidence in the LI cohort at Time 1 but not Time 2.
- Writing fluency scores were particularly depressed relative to test norms and a substantial minority of pupils refused to produce a written text.
- Spelling scores were depressed for the LI but not ASD cohorts relative to the test mean.

3.5. What was the profile of autism behavioural characteristics of the pupils?

A number of standard parent and teacher questionnaires exist that measure the degree of autism characteristics (or 'symptoms') that a child may demonstrate. We used two of the most widely-used scales the Social Communication Questionnaire (SCQ; Rutter, Bailey, & Lord, 2003) and the Social Responsiveness Scale (SRS; Constantino & Gruber, 2005).

Parent report on the Social Communication Questionnaire was available at Time 1 for 38 pupils with LI (39%) and 37 pupils with ASD (58%). This comprises 3 subscales measuring

the three behavioural domains that characterise autism spectrum disorders, namely Reciprocal Social Interaction, Communication and Restricted, Repetitive and Stereotyped Patterns of Behaviour, as well as a Total score. All the scores presented for the SCQ are raw scores since no population norms exist. As shown in Figure 3.23, and in line with the primary identified need, the ASD cohort scored significantly higher on this autism symptom measure than the LI cohort on each of the 3 subscales and on the total score.

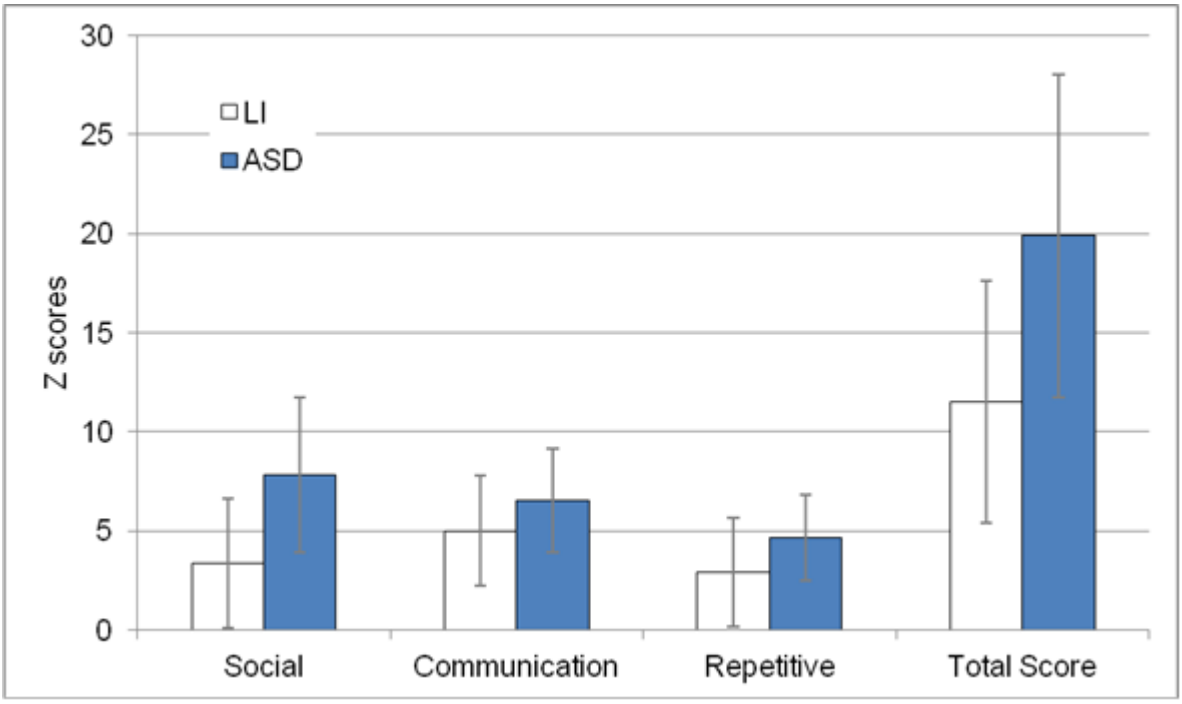

Figure 3.23. Performance (M±SD) on the Social Communication Questionnaire (SCQ)

Note: Social = Reciprocal social interaction, Repetitive = Restricted, repetitive and stereotyped patterns of behaviour.

To probe the effect of year group, data were analysed in the combined LI and combined ASD cohorts and also across two year groups (younger: combined Years 1 and 3 vs. older: combined Years 5 and 7). In line with the above analysis, the ASD cohort scored more highly than the LI cohort on all three subscales (reciprocal social interaction, communication and on restricted, repetitive and stereotyped behaviours) and on the SCQ Total score of this autism symptom severity measure (data not shown).

Teachers completed the Social Responsiveness Scale (SRS) at Time 2 for 59 pupils with LI (60%) and 41 pupils with ASD (64%). As shown in Figure 3.34, whilst both cohorts had elevated scores on the SRS compared to the normative sample, in line with the School Census primary identified need the ASD cohort scored significantly higher on this autism symptom measure than the LI cohort on 4 of the 5 subscales (the difference on Social

cognition just failed to reach significance) and on the SRS total score. However, it is noteworthy that the mean scores for the LI cohort were also elevated compared to the normative sample (albeit with considerable variability) indicating that some of the pupils with LI showed considerable levels of autism behavioural symptomatology.

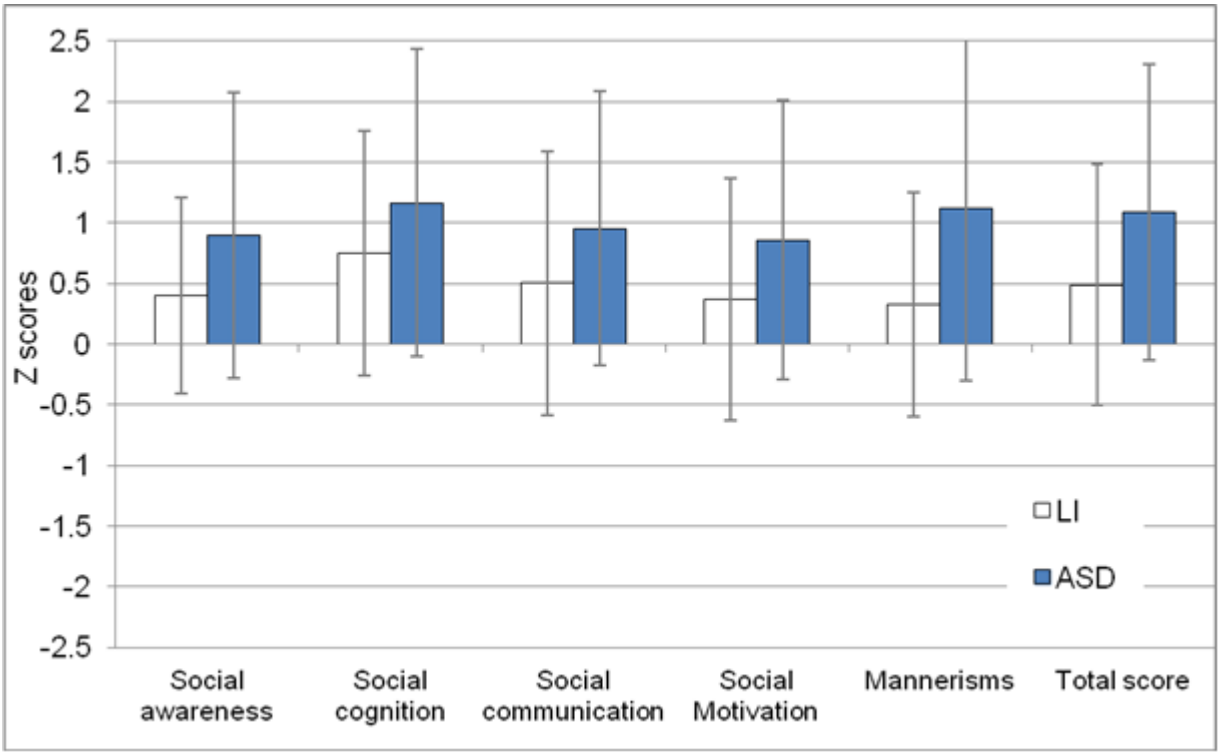

Figure 3.24. Performance (M±SD) teacher rated scores on the Social Responsiveness Scale (SRS) at Time 2

Since teacher completed SRS results were also available from the screening phase, a repeated measures ANCOVA was conducted with time (Screening vs. Time 2) as the within-participants factor, cohort (LI vs. ASD) as the between-participants factor and Time 1 nonverbal ability as the covariate. Only pupils on whom teachers had completed the SRS at both Screening and Time 2 (53 LI pupils, 38 ASD pupils) were included in this analysis. This analysis confirmed the main between-cohort factor on all SRS subscales and total score, with the ASD cohort scoring higher than the LI cohort indicating higher levels of autism-related symptoms (difficulties). A significant effect was also found for Time on all SRS subscales and the SRS Total score. This was accounted for by lower scores across both cohorts at Time 2 compared to Screening, indicating a reduction in autism characteristics (or symptoms) as the pupils in both cohorts mature.

At Time 2 parents also completed the SRS for 42 pupils with LI (43%) and 40 pupils with ASD (63%) and the scores of the LI and ASD cohorts are shown in Figure 3.25. Parent ratings of autism symptoms were very highly elevated compared to the normative sample in

both the LI and ASD cohorts but the scores were significantly higher, indicating greater presence of autism-related behaviours, in the ASD cohort compared to the LI cohort and this reached significance on 4 of the 5 subscales (reaching only a nonsignificant trend on the social cognition subscale) and on the total score.

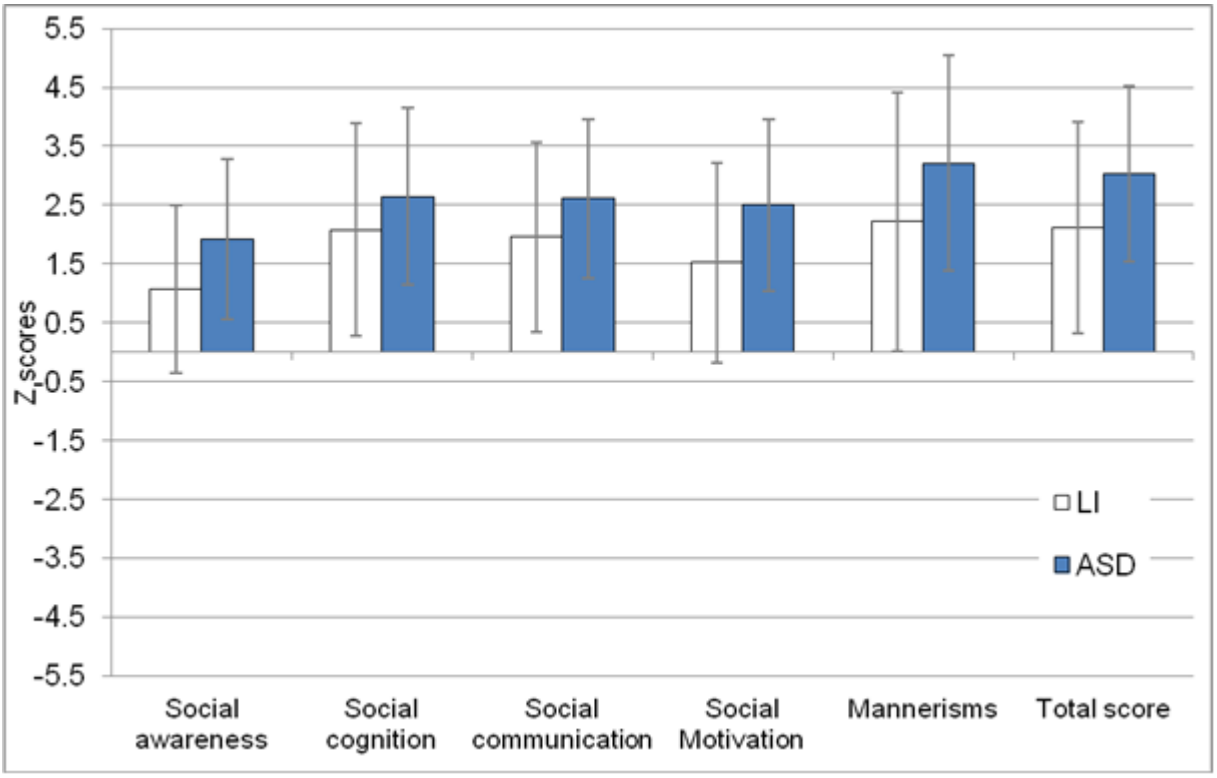

Figure 3.25. Performance (M±SD) parent rated scores on the Social Responsiveness Scale (SRS) at Time 2

Comparing the teacher and parent scores on the SRS at Time 2 we found that parents reported higher levels of autism characteristics than teachers. Parent and teacher responses were received for 53 participants from both LI and ASD cohorts (31% of our sample). Paired t-tests indicated that there was a significant difference between parent and teacher report on all subscales and the SRS total score (all $p < .001$). Correlations between teacher and parent scores were modest but all significant (all $p < .05$) reaching .40 for the SRS total score and ranging from .32 to .39 for the subscales. Constantino et al. (2007) also found that parents reported higher levels of autism characteristics than teachers, presumably reflecting the broader samples of their child's behaviours to which they are exposed. Notably though, Constantino et al. (2007) reported a higher level of parent-teacher agreement than we found in our study (.72 for the total scores, ranging from .57 to .69 across the 5 subscales).

Box 3.4. Summary of autism behavioural characteristics

- In line with pupils' identified SEN, both teachers and parents reported higher levels of autism characteristics (or 'symptoms') in the ASD cohort compared to the LI cohort.
- Importantly though, scores of the LI cohort were considerably elevated compared to the population norms, indicating that they also have significant difficulties in some aspects of reciprocal social interaction communication, and with rigid and repetitive behaviours. This is consistent with the notion that there is some overlap in the behavioural phenotype of children and young people with ASD and LI/SLI (e.g., Bishop, 2003).
- On the teacher report measure, repeated at both Time 1 and Time 2, there was some reduction in the levels of autism characteristics across time, consistent with the notion that as pupils mature they continue to develop social and communication skills, despite their elevated levels of difficulty in these domains of behaviour (see also Constantino et al, 2009).
- Finally, we found that there were only modest correlations between the ratings of parents and teachers but that parents reported higher levels of autism characteristics than teachers as has been found previously (Constantino et al, 2007), presumably reflecting the broader sample of their child's behaviour to which they are exposed compared to behaviour that teachers observe within school.

3.6. What do teachers report about pupils' behaviour?

Teachers completed the Strengths and Difficulties Questionnaire (SDQ) at Time 1 for 64 pupils with LI (65%) and 42 pupils with ASD (66%). The SDQ measures emotional and behavioural difficulties and has five subscales: emotional symptoms, conduct problems, hyperactivity, peer problems and prosocial behaviour, in addition to a total difficulties score and an impact score. With the exception of the prosocial behaviour subscale, which measures positive social abilities, the other 4 subscales and the total problems score are measures of behavioural problems with higher scores indicating greater difficulties.

As shown in Figure 3.26, at Time 1 both the LI and the ASD cohorts showed elevated scores on the emotional/behavioural difficulties subscales and depressed scores on the prosocial behaviour subscale compared to the normative sample. Within both cohorts there was considerable variability in scores as shown by the wide standard deviation error bars. The LI and ASD cohorts did not differ from one another on the emotional symptoms, conduct

problems, and hyperactivity subscales. The ASD cohort showed significantly more difficulties on the peer problems and the prosocial behaviour subscales. The LI and ASD cohorts did not differ from one another on the total difficulties score or the impact score.

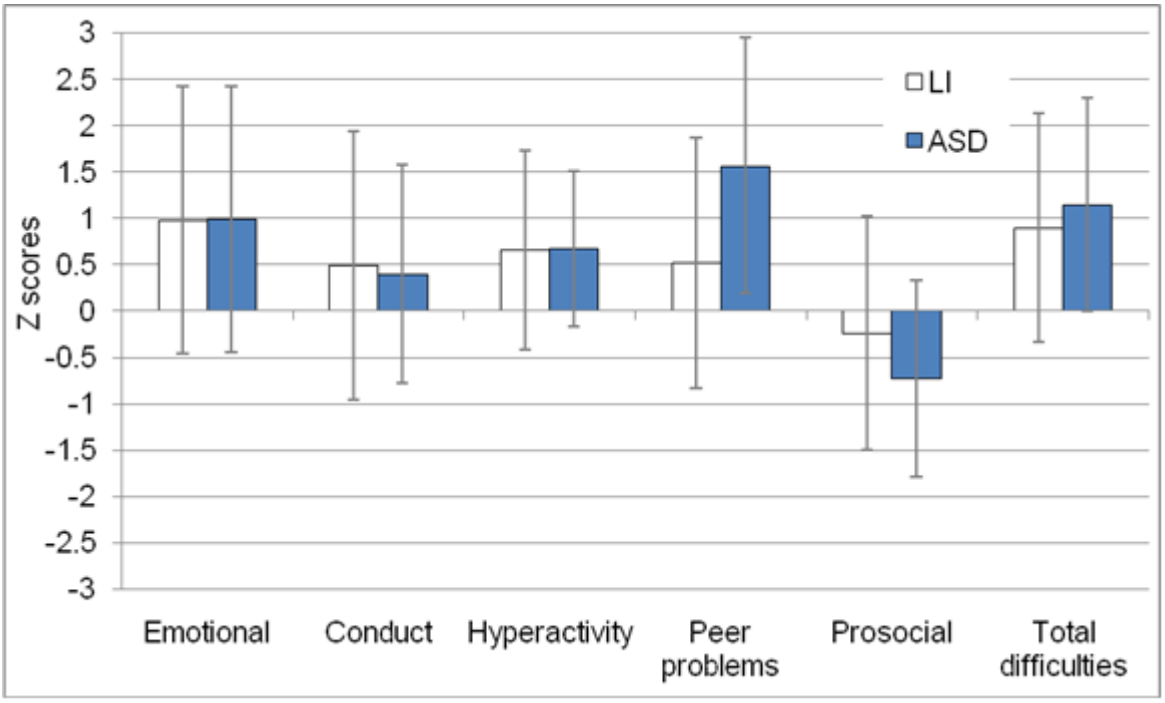

Figure 3.26. Performance (M±SD) scores on the Strengths and Difficulties Questionnaire (SDQ) at Time 1

Teachers completed the SDQ at Time 2 for 61 pupils with LI (62%) and 42 pupils with ASD (66%) (see Figure 3.27). At Time 2 the pattern of scores on the SDQ was very similar to that at Time 1; both the LI and the ASD cohorts showed elevated scores on the emotional/behavioural difficulties subscales and depressed scores on the prosocial behaviour subscale compared to the normative population sample. Again, within both cohorts there was considerable variability in scores as shown by the wide standard deviation error bars. As at the earlier time point, the LI and ASD cohorts did not differ from one another on the emotional symptoms, conduct problems, and hyperactivity subscales as at Time 1. The ASD cohort showed significantly more difficulties on the peer problems and the prosocial behaviour subscales. The LI and ASD cohorts did not differ from one another on the total difficulties score.

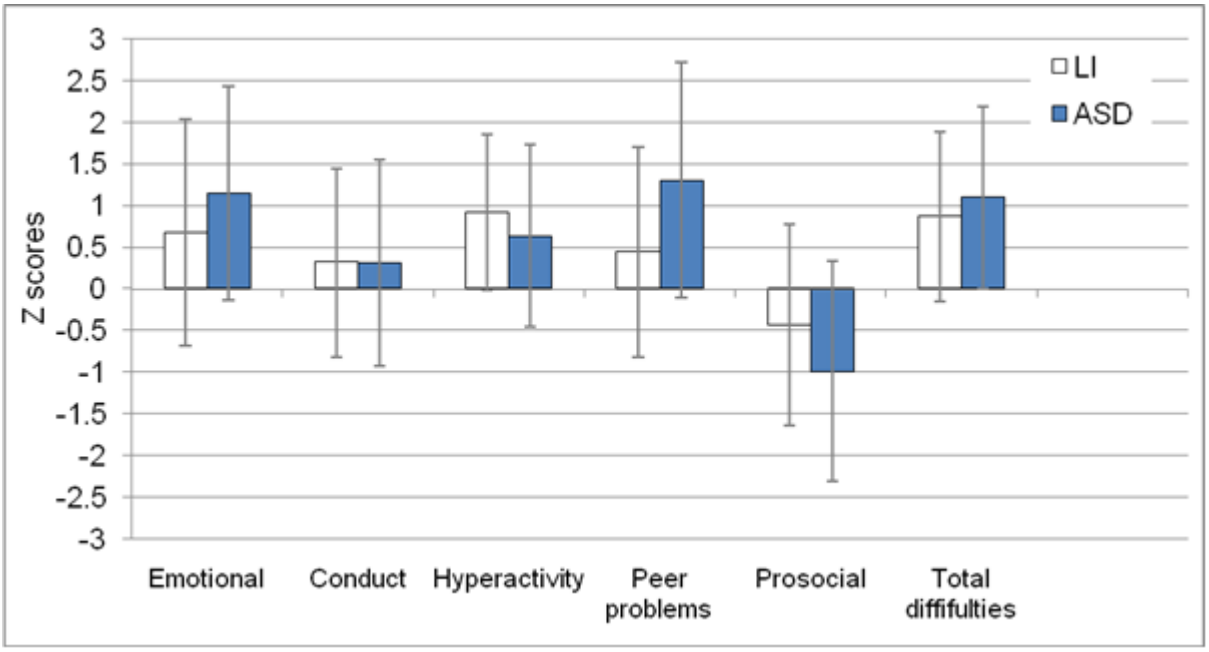

Figure 3.27. Performance (M±SD) scores on the Strengths and Difficulties Questionnaire (SDQ) at Time 2

For the pupils for whom teachers had completed the SDQ at both time points (44 LI, 30 ASD) a repeated measures analysis was conducted. This broadly confirmed the pattern seen at both Time 1 and Time 2 with the ASD showing more difficulties than the LI cohort on the peer problems and prosocial subscales but the LI and ASD cohorts showing similar levels of elevated scores (indicating behavioural difficulties) on the other 3 subscales and the total difficulties score.

To examine year group effects data were analysed in the combined LI and combined ASD cohorts and also across Years 1 and 3 and Years 5 and 7. The year group scores on the teacher-completed SDQ at Time 1 are shown in panels a and b of Figure 3.28. This confirmed the overall effect of cohort with the ASD scoring higher (indicating greater difficulties) than the LI cohort on the peer problems subscale and scoring lower (again indicating greater difficulties) on the prosocial subscale. However, two significant cohort (ASD vs. LI) by year group (1 and 3 vs. 5 and 7) interactions were found on the peer problems and prosocial subscales, reflecting the fact that at Time 1 the Years 5 and 7 LI children showed greater difficulty than the Years 1 and 3 LI children but that the Years 5 and 7 ASD children showed a somewhat lower level of difficulties in these areas of behaviour than the Year 1and 3 children. So in our sample the pupils with LI in Years 5 and 7 demonstrated greater difficulties with social interaction with their age peers than the younger children with LI in Years 1 and 3.

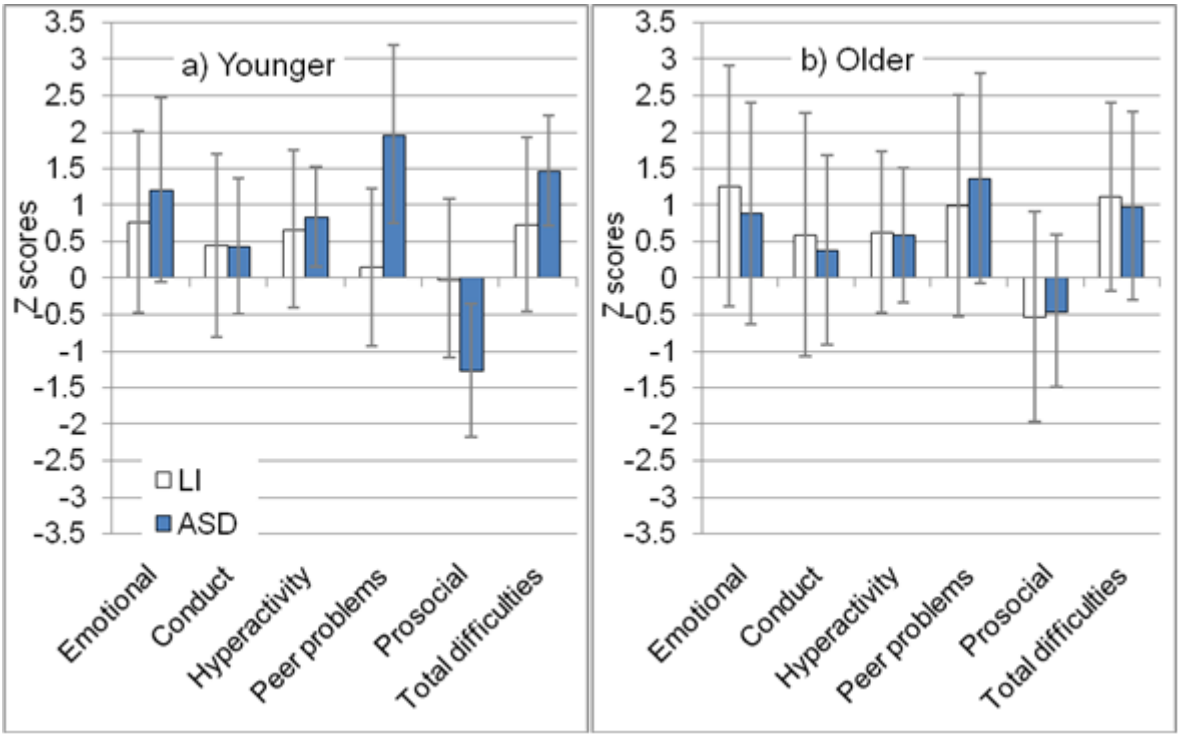

Figure 3.28. Performance (M±SD) SDQ scores for younger and older pupils at Time 1

At Time 2 there were no year group effects or interaction with year group (shown in panels a and b of Figure 3.29).

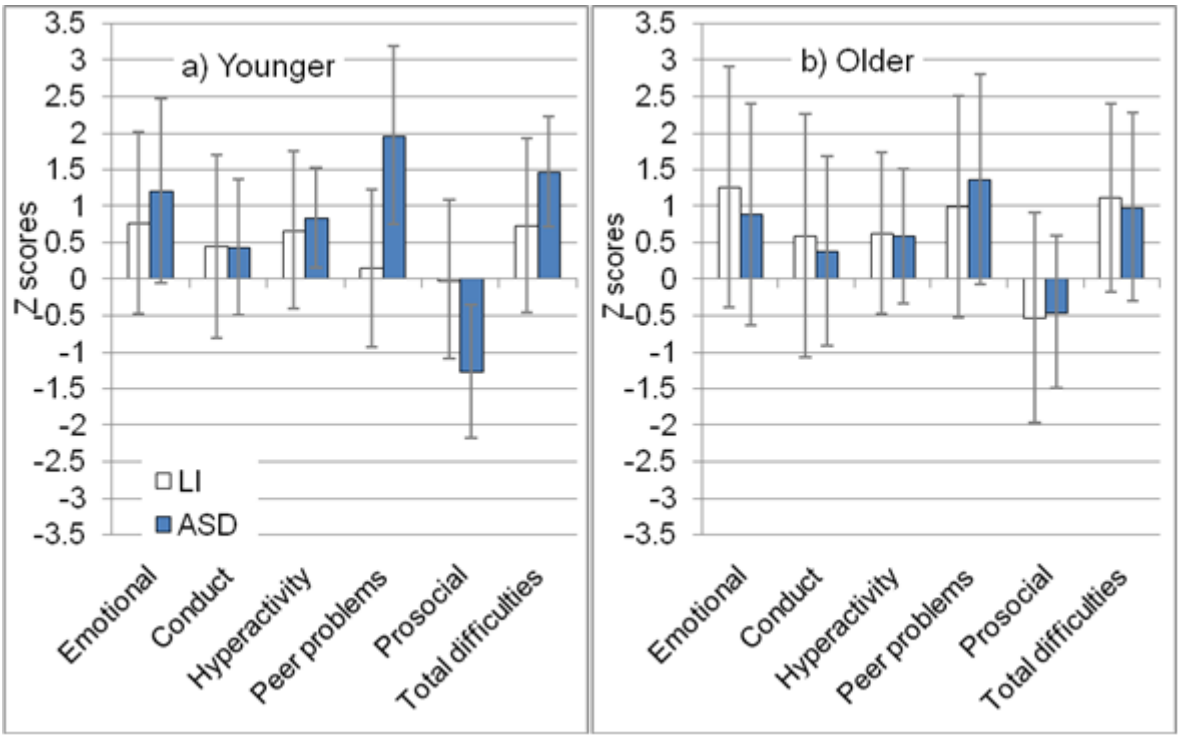

Figure 3.29. Performance (M±SD) SDQ scores for younger and older pupils at Time 2

Box 3.5. Summary of teacher reports about pupils' behaviour

- Teachers reported on a range of emotional and behavioural difficulties in the LI and ASD cohorts and described rates that were significantly elevated compared to test norms.
- LI and ASD profiles were similar on subscales measuring emotional problems, conduct/behavioural problems and hyperactivity, and Total difficulties indicating that both groups generally showed significant behavioural difficulties at school; however the levels of conduct problems were similar to test norms.
- Impoverished peer interactions and prosocial behaviours were more closely associated with the ASD than LI cohorts, reflecting particular difficulties with social communication in the pupils with ASD.
- Notably, for the children with LI, the levels of difficulty with social interaction with their age peers was greater for the older pupils (Years 5 and 7) than the younger pupils (Years 1 and 3).
- This may indicate that social interaction becomes a greater area of need for LI pupils as they get older. However, our data are cross-sectional. To confirm this possible trajectory, longitudinal data would be needed following the current cohort

.

3.7. What do pupils report about their emotional and social well-being?

The KIDSCREEN is a child and young person self-report quality of life measure, normed across a number of European Union (EU) countries (Ravens-Sieberer et al., 2005). The 52-item version we used has the following subscales: physical well-being, psychological well-being, moods and emotions, self-perception, autonomy, parent relations and home life, social support and peers, school environment, social acceptance and bullying, and financial resources. Pupils recruited from Years 3, 5 and 7 completed the KIDSCREEN at Time 1: 65 LI, 66%; 51 ASD,(80%) and again at Time 2: 66 LI, 67%; 51, 80%). Data were analysed in the combined LI and combined ASD cohorts, with Time 1 NVIQ covaried in the analysis. Mean *Z* scores and standard deviations are shown in Figure 3.30. As the KIDSCREEN yields scores on a large number of subscales, for clarity we have divided them up into two groups, those pertaining to self-related quality of life (panel a in Figure 3.30) and environment-related quality of life (panel b of Figure 3.30).

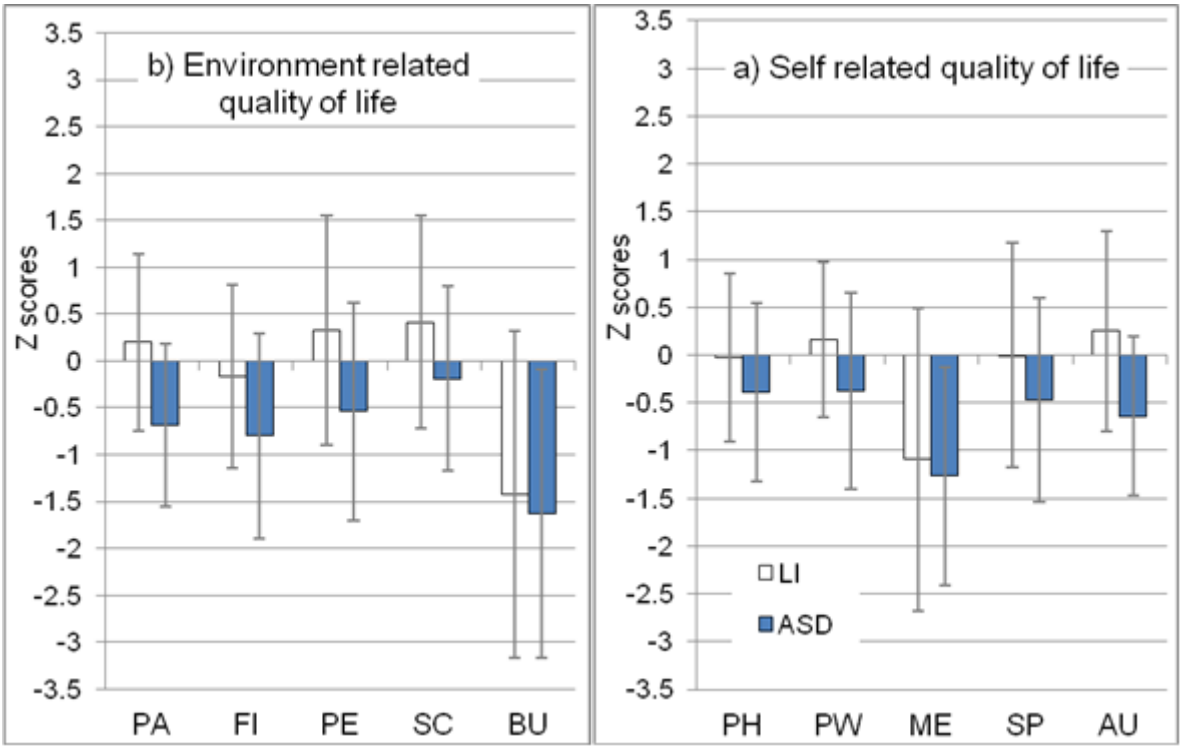

Figure 3.30. Performance (M±SD) scores on the KIDSCREEN at Time 1 a) self related quality of life b) environment related quality of life

Note. Panel a) PH= physical well-being, PW= psychological well-being, ME= moods and emotions, SP= self-perception, AU = autonomy. Panel b) PA = parent relations and home life, FI = financial resources, PE = social support and peers, SC= school environment, BU = social acceptance (bullying).

As indicated by Figure 3.30, the cohorts showed a mixed pattern across the KIDSCREEN subscales with the pupils with LI showing scores within the range of the normative sample on many of the subscales but the ASD cohort scoring below the range of the normative sample on all subscales, indicating a reduced self-reported quality of life. When cohort differences were examined the ASD cohort had lower scores than the LI cohort, indicating impoverished quality of life, on the psychological well-being, autonomy, parent relations and home life, social support and peers, school environment, and financial resources subscales. The cohorts not differ from each other on physical well-being and self-perception. Neither did the LI and ASD cohort differ from each other on the moods and emotions and the social acceptance /bullying subscales but notably on these subscales both cohorts scored much lower than the normative sample, indicating more impoverished quality of life.

Scores on the KIDSCREEN at Time 2 are shown in Figure 3.31 (panels a and b). A similar pattern of differences emerged with the ASD scoring lower than the LI cohort, indicating

more impoverished quality of life on the psychological well-being, parent relations and home life, social support and peers and school environment scales. The cohorts did not differ from one another on the other subscales and notably both scored well below the normative average range on the social acceptance and bullying subscale.

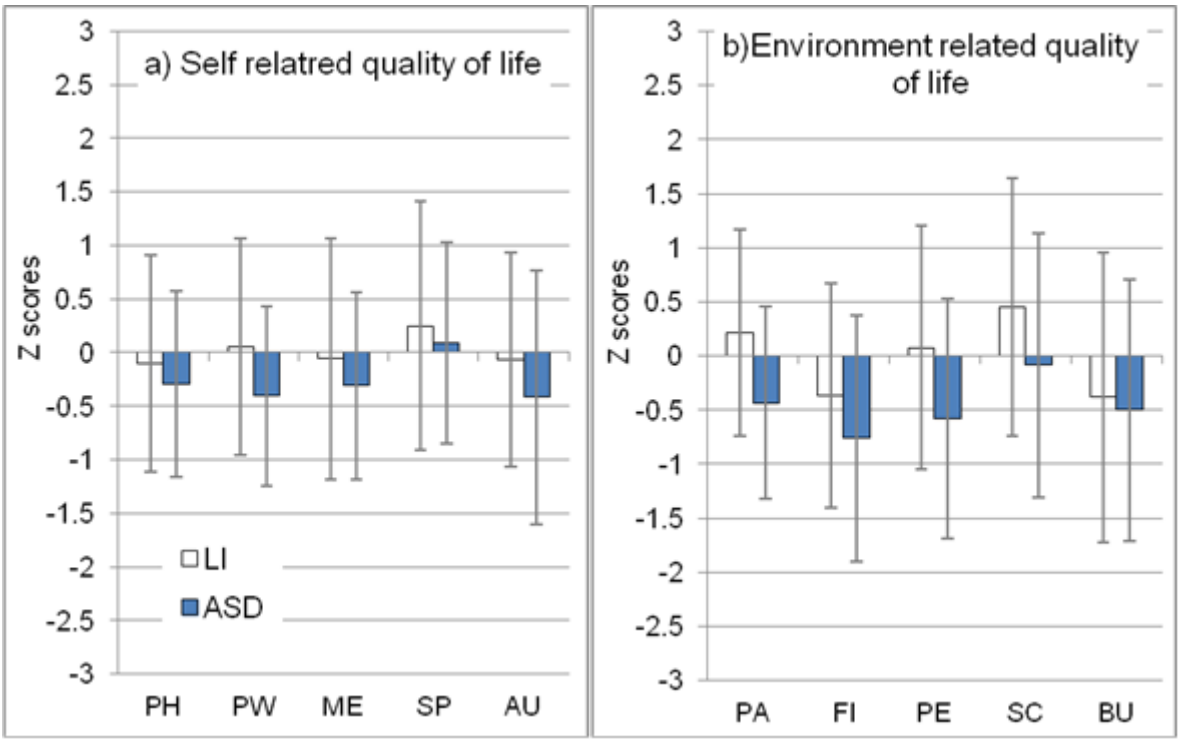

Figure 3.31. Performance (M±SD) scores on the KIDSCREEN at Time 2 a) self related quality of life b) environment related quality of life

Note. Panel a) PH= physical well-being, PW= psychological well-being, ME= moods and emotions, SP= self-perception, AU = autonomy. Panel b) PA = parent relations and home life, FI = financial resources, PE = social support and peers, SC= school environment, BU = social acceptance (bullying).

In order to examine change in KIDSCREEN scores between Time 1 and Time 2 a repeated-measures ANCOVA was conducted as described above. There were main effects of time on the moods and emotions, self-perception, and social acceptance and bullying subscales, indicating that in each case both cohorts had improved quality of life scores on these subscales between Time 1 and Time 2.

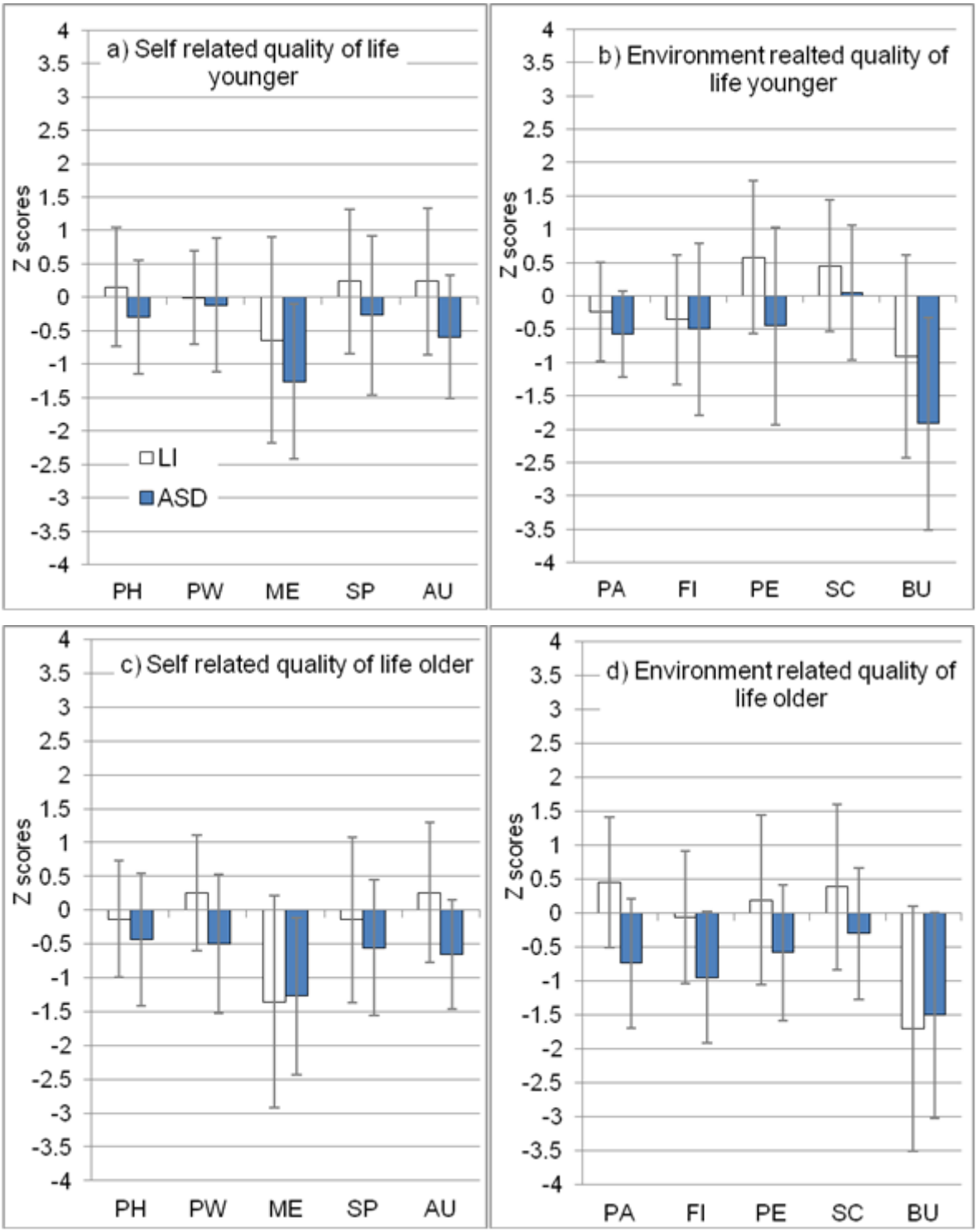

Figure 3.32. Performance (M±SD) KIDSCREEN for pupils at Time 1 a) self related quality of life for younger pupils, b) environment related quality of life for younger pupils, c) self related quality of life for older pupils, d) environment related quality of life for older pupils

Note. See Figure 3.31 for key.

Data were analysed in the combined LI and combined ASD cohorts and also across Years 1 and 3 and Years 5 and 7. The year group scores on the self-completed KIDSCREEN at Time 1 are shown in panels a, b, c and d of Figure 3.32. Aside from the cohort differences reported previously, this analysis found two significant interactions for the parent relations and home subscale and the social acceptance and bullying subscale. Follow-up post-hoc tests revealed that within the LI cohort the combined Year 5 and 7 group had a higher parent relations and home subscale score than the Years 1 and 3 group, indicating enhanced quality of life whilst the two ASD year groups did not differ from each other. However, on the social acceptance and bullying subscale the differences between the Year 1 and 3 and Year 5 and 7 pupils did not reach significance.

Box 3.6. Summary of emotional and social well-being

- Pupils reported on their own quality of life using the widely used and EU normed KIDSCREEN measure.
- The ASD cohort reported lower levels of quality of life compared to the normative samples on all subscales.
- The LI cohort showed a different pattern with scores within the normative or average range on many subscales, with the exception of the mood and emotions subscale and the social acceptance and bullying subscale where they showed low levels of quality of life comparable to those reported by the ASD cohort.
- The pupils completed this questionnaire at both Time 1 and Time 2 and showed some improvements in the self-reported quality of life across time, including on the mood and emotion and on the social acceptance and bullying domains, on which both groups showed particularly elevated scores at Time 1.

3.8. How do pupils with LI and ASD perform on national curriculum tests at Key Stages 1 and 2?

The Department for Education (DfE) provided us with information about attainment at Key Stage 1 and Key Stage 2 in the form of points scores on national curriculum tests.

3.8.1. Key Stage 1 attainment

Performance on Key Stage 1 tests were obtained for 107 pupils recruited in Years 1, 3 and 5 (96% of pupils from these year groups). For each child, we considered performance on reading, writing, English (average of reading and writing scores), maths, science, and an

average score, which was the mean of performance across all test tests. Analyses explored differences in mean point scores across two cohorts (LI, ASD). Figure 3.33 summarises attainment for Key Stage 1. For comparison, Figure 3.33 also shows national averages for all pupils in England where available[26]. Both LI and ASD groups performed at a level that was substantially below national averages.

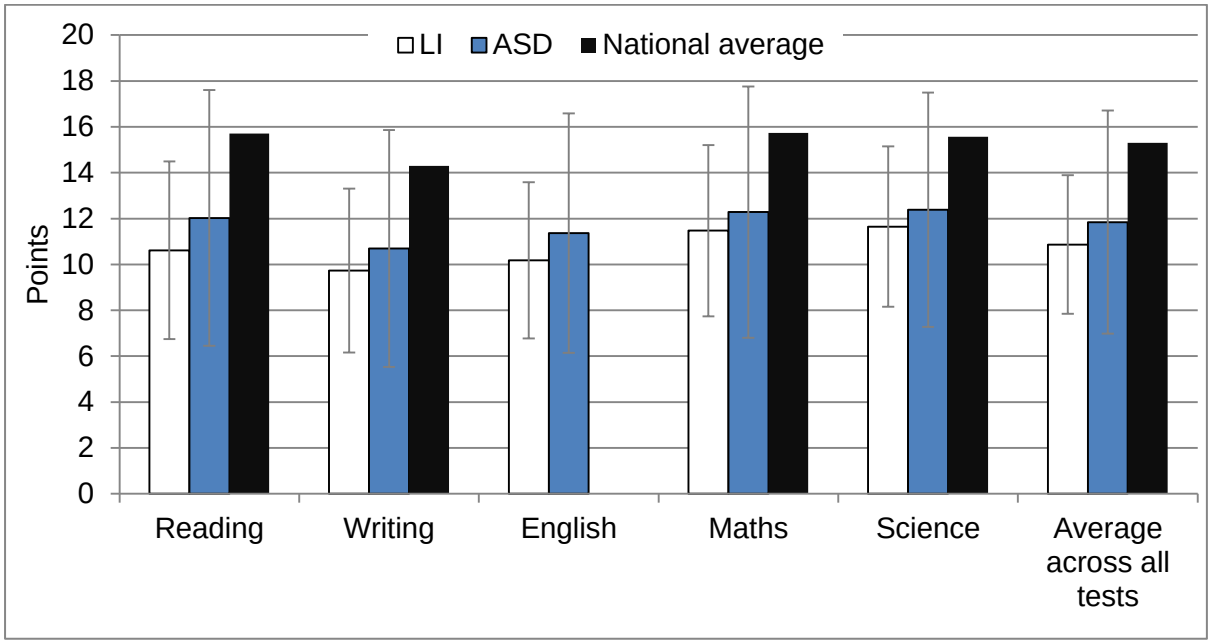

Figure 3.33. Performance (*M*±*SD*) on Key Stage 1 national curriculum tests

As Figure 3.33 presents scores that are not corrected for age, cohort effects were examined using analyses that controlled for age as well as nonverbal ability. As indicated by Figure 3.33, performance was equivalent across cohorts. However, scores were more varied for ASD pupils. When year group effects were examined (Years 3 and 5 only), analyses controlled for nonverbal ability. Year groups did not differ significantly for reading, writing, English, maths, and the average score and the year group by cohort interaction were not significant for any Key Stage 1 measure. However, there was a main effect of year group on the science test such that Year 3 pupils performed significantly worse than those recruited in Year 5. Performance for pupils in Year 3 and 5 on the science test is presented in Figure 3.34.

[26] Our pupils recruited in Years 1, 3 and 5 took Key Stage 1 assessments in the summers of 2011, 2009 and 2007 respectively. National averages from each year varied very little. Nonetheless, the black bars in Figure 3.33 reflect the mean of the average point score for all children in England taking the tests in 2011, 2009 and 2007.

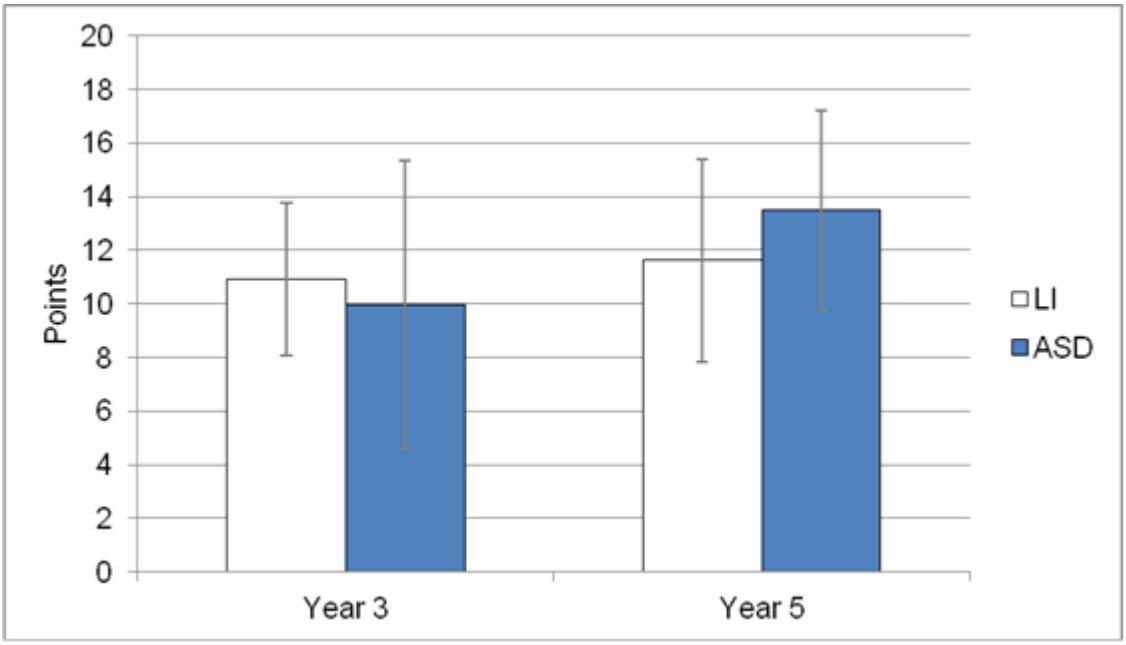

Figure 3.34. Performance (M±SD) on Key Stage 1 science test by year group

3.8.2. Key Stage 2 attainment

Key Stage 2 test results were obtained for 79 pupils, 98% of those recruited in Years 5 and 7. Of these, 79 pupils completed the maths test, 78 completed the English test and 51 completed the science test. Separate scores for reading and writing were not available. Since the number of pupils completing the science test was low, we computed an average score for each child based on English and maths tests only. This meant that across children the average score (*n* = 78) was based on the same aspects of the curriculum. Figure 3.35 summarises performance on Key Stage 2 English, maths and science tests and presents the average point score across English and maths. For comparison, Figure 3.35 also shows national averages for all pupils in England where available[27]. Both LI and ASD groups performed at a level that was substantially below national averages.

[27] Our pupils recruited in Years 5 and 7 completed Key Stage 2 assessments in the summers of 2011 and 2009 respectively. National averages from each year varied very little. Nonetheless, the black bars in Figure 3.35 reflect the mean of the average point score for all children in England taking the tests in 2011 and 2009.

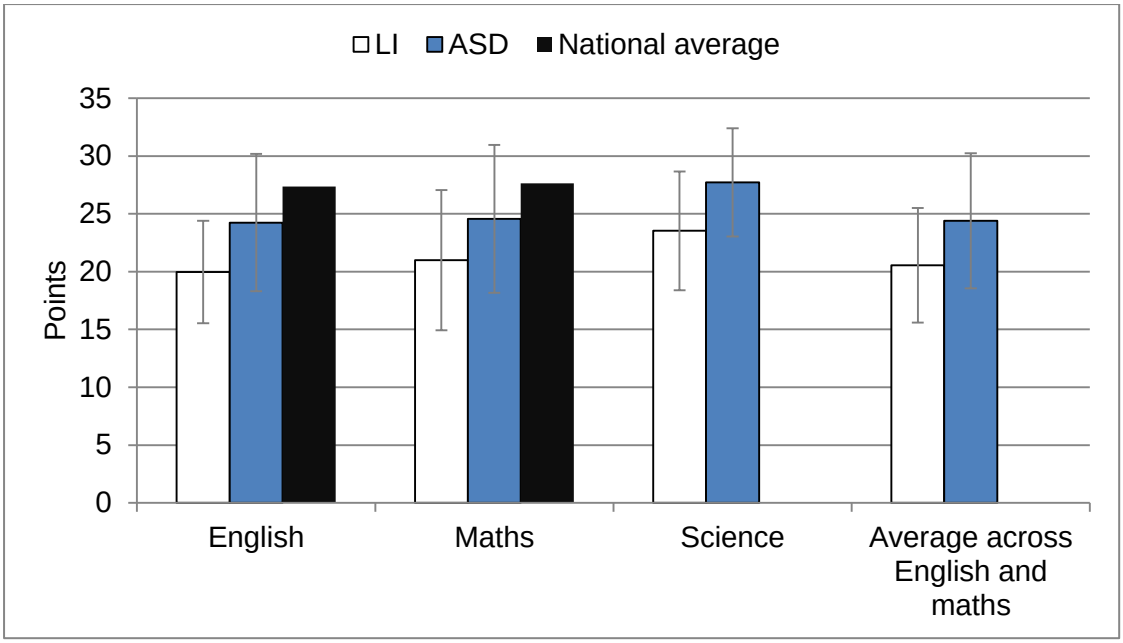

Figure 3.35. Performance (*M*±*SD*) on Key Stage 2 national curriculum tests

As above, cohort effects were examined using analyses that controlled for age as well as nonverbal ability. As indicated by Figure 3.35, ASD pupils obtained higher scores than LI pupils and this cohort difference was significant for English and science but not for maths and the average score. When year group effects were analysed (controlling for nonverbal ability only), there were no year group effects and no interactions between year group and cohort.

3.8.3. Progress

To investigate progress on national curriculum tests we calculated three scores to reflect the difference between the number of points obtained in Key Stage 1 and Key Stage 2. For English and maths we generated progress scores by subtracting between Key Stage 1 and 2 scores. For the average progress score we derived an average score for Key Stage 1 that was based on English and maths (and not science) for consistency with the average Key Stage 2 score. The Key Stage 1 average was then subtracted from the Key Stage 2 average. It was possible to compute these scores for 28 pupils, 93% of those recruited in Year 5. Figure 3.36 depicts English, maths and average progress from Key Stage 1 to Key Stage 2 across cohorts. As shown in Figure 3.36, performance across cohorts was equivalent on all measures.

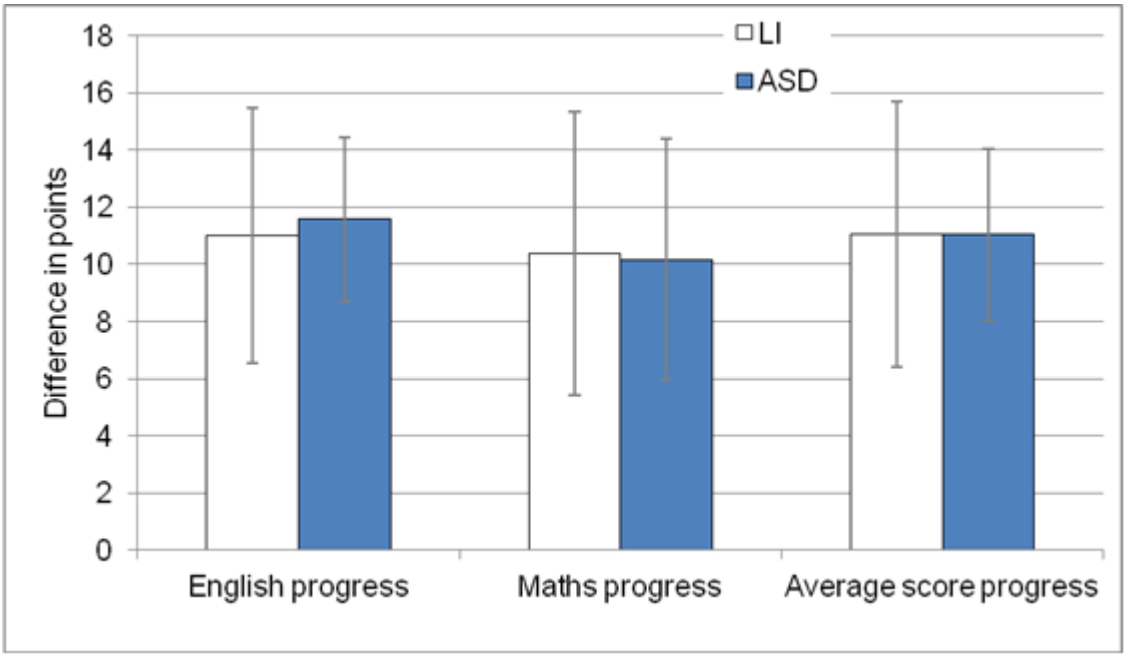

Figure 3.36. Progress (M±SD) from Key Stage 1 to Key Stage 2 on national curriculum tests

Box 3.7. Summary of national curriculum tests at Key Stages 1 and 2

- Performance on national curriculum tests highlighted few differences between cohorts, indicating that national curriculum tests are not very sensitive to the diverse needs associated with pupils with LI and ASD.
- At Key Stage 1, cohorts showed equivalent performance and LI and ASD pupils made the same amount of progress between Key Stages 1 and 2.
- At Key Stage 2, cohorts did not differ on maths or average scores. However, ASD pupils scored significantly higher than LI pupils on Key Stage 2 English and science tests.
- This indicates that differences between the cohorts on these aspects of the curriculum emerge over time and is consistent with our findings from standardised tests of literacy.

3.9. How did teachers report that the pupils' needs were being met in school?

Teachers completed a questionnaire at Time 1 and Time 2 detailing any additional support provided to the pupils and reporting the strategies that they used in the classrooms to differentiate the curriculum and support learning. Table 3.2 provides details of the numbers of questionnaires completed across the four cohorts at the two time points. Given the small numbers cohort comparisons are made between LI and ASD cohorts as appropriate.

Table 3.2. Numbers of pupils for whom completed questionnaires were received

	LI-av-NV	ASD-av-NV	LI-low-NV	ASD-low-NV	*n* (%) total sample
Time 1	44	34	19	8	105 (65)
Time 2	34	29	14	10	87 (54)

3.9.1. Additional support provided

Full details of teachers' responses to the questions about support are provided in Appendices 6 and 7. Teachers were asked to identify whether pupils were provided with additional support and who provided the support (LSAs, SENCO, SLTs, or other professionals). They also indicated the way support was provided - in class, by group or individual withdrawal or by consultancy.

Consultancy by SLTs and consultancy by other professionals were reported infrequently. At Time 1 there were four reported counts of SLTs providing support through consultancy (2 for LI and 2 for ASD) and for other professionals there were 2 reports (1 for LI and 1 for ASD). Similarly, involvement by other professionals was low, working with the pupils either in the classroom (*n* = 14), by group withdrawal (*n* = 9) or individual withdrawal (*n* = 14).

Figure 3.37 provides details of the reported involvement of the professionals who were involved with significant numbers of pupils. As Figures 3.37 shows, support varied in terms of the professional involved and the way the support was organised.

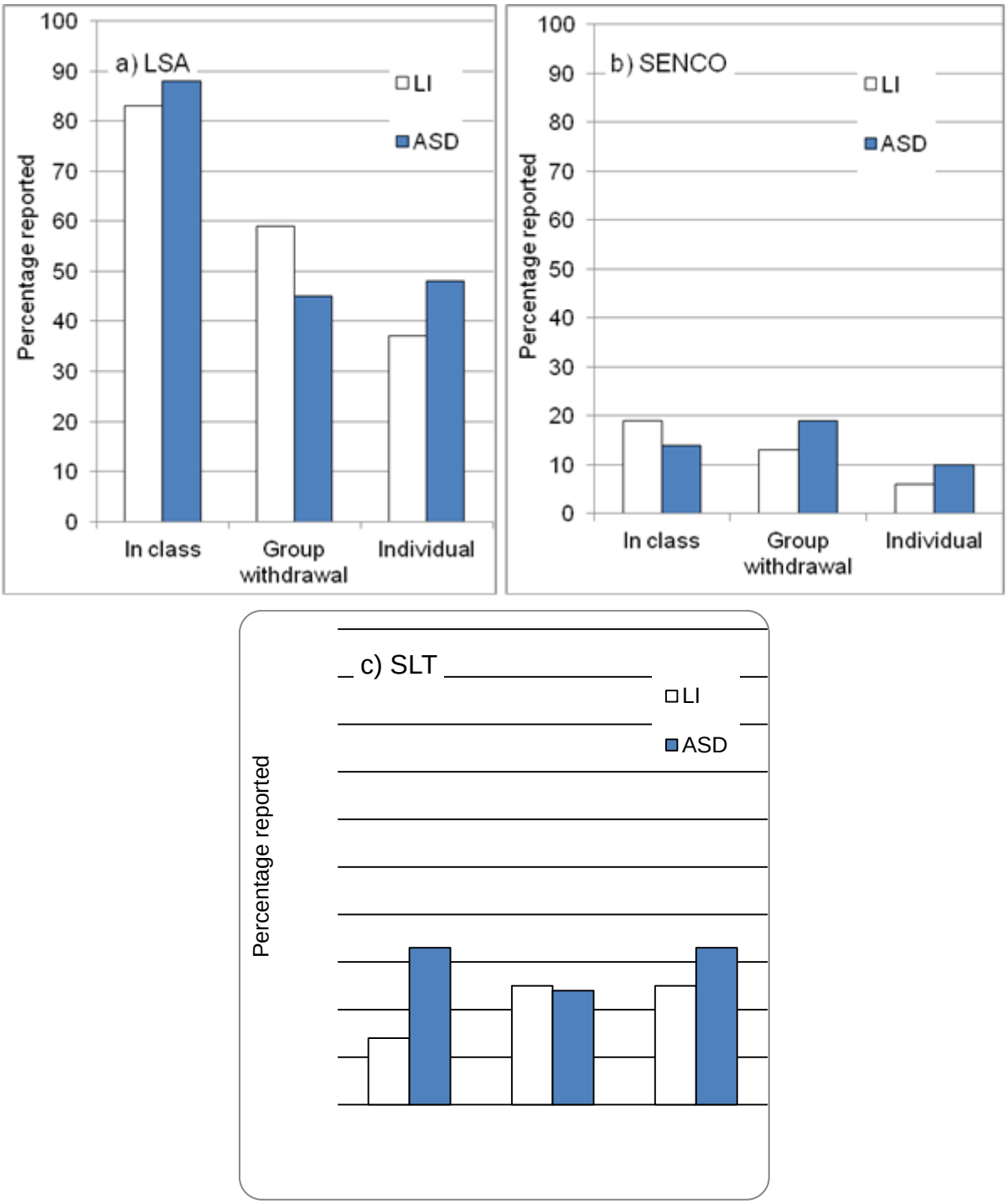

Figure 3.37. Percentage of pupils for whom a) LSA, b) SENCO and c) SLT support was reported in class, within groups and individually at Time 1

We examined whether the way support was reported to be provided differed by cohort – LI or ASD. Statistical analyses (Chi Square) showed no significant difference in the distributions of who provided the support (LSAs, SENCOs and SLTs) or how the support was provided across cohorts. As Figure 3.37 shows, the percentage of pupils reported to be

receiving in class support by the LSA was high, as was support by the LSA in either group or individual withdrawal.

A significant minority of pupils were also receiving SLT support in class, or withdrawal either group or individually (pupils could be receiving one or more types of support). Direct support by SENCOs was less evident. This pattern of reported support was repeated at Time 2. Direct comparisons are not possible as data were not available in sufficient numbers to compare individual pupils at both time points. Nonetheless it was evident that it continued to be the case that a high proportion of the pupils were reported to be supported in class by LSAs at Time 2; there continues to be involvement by SLTs with a substantial minority of the pupils but less direct involvement by SENCOs.

Given concerns about unmet language needs in secondary schools (Law, 2000, Lindsay et al., 2002) and the reported decrease in SLT provision at secondary level, (Dockrell et al., 2006; Lindsay et al., 2005a,b) we were interested to compare the distribution of SLT provision for the pupils across primary and secondary schools. For this analysis we compared pupil support from the questionnaires received at Time 2 where we have more pupils in secondary school. The data are presented in Table 3.3 for the 87 pupils where questionnaires were completed. Overall SLT support was reported less frequently in the secondary than the primary phase and this difference is most evident in terms of the likelihood of receiving therapy in groups or individually.

Table 3.3. Numbers of pupils receiving SLT support at Time 2 by primary and secondary education

Reporting SLT support	Location	Primary (*n* = 44)	Secondary (*n* = 43)	Chi Square
Overall SLT support		37 (84%)	13 (30%)	P < .001
	In class	9 (20%)	6 (14%)	[a]ns
	Group withdrawal	14 (32%)	4 (9%)	[a]*p* = .015
	Individual withdrawal	14 (32%)	3 (7%)	[a]*p* = .005

Note: [a]Fisher's exact probability test

3.9.2. Curriculum differentiation and teacher strategies

Teachers were asked whether differentiation occurred for the target pupil for the whole curriculum and for literacy specifically, and whether special programmes were in use. They then rated the extent to which they modified the curriculum using 12 different strategies. An open ended question allowed teachers to provide additional information or new strategies.

Across both Time 1 and Time 2, teachers reported high levels of curriculum differentiation. At Time 1 the whole curriculum was reported to be differentiated for 84% of the pupils (LI: 91%; ASD: 75%) and Time 2 for 68% of the pupils (LI: 79%; ASD: 54%). Literacy was reported to be differentiated for virtually all pupils at Time 1 and Time 2 in both cohorts; for only 4% of the pupils at Time 2 did teachers state that the curriculum was not differentiated in literacy (LI: $n = 1$; ASD: $n = 2$). Special programmes were not in common use in the classrooms (reported as used always or sometimes at Time 1: 9% and Time 2: 9%).

Next, we examined teachers' responses to the curriculum differentiation strategies (see Table 3.4). Teachers did not always answer all questions (Time 1 12% of respondents; Time 2 18% of respondents). However in each case respondents omitted fewer than 4 of the 12 items. We therefore analysed the data in terms of the proportion of responses received to each item. Given the skewed nature of the data, non-parametric analyses were used. We examined differences between the two cohorts using Mann-Whitney U tests and differences between the four year groups using the Kruskal-Wallis test. Where significant differences are found they are noted in the table. As Table 3.4 shows, strategies differed in their reported use. Providing task related feedback was reported to occur often across both time points, while using checklists or providing students with a computer or tape recorder was reported less frequently.

As shown in Table 3.4, there were only three differences by cohort and two by year group and therefore the data in the table are grouped for ease of reading. Statistical differences are noted with an asterisk. At Time 1, teachers' reports indicated that pupils with LI were more likely to be set easier levels of work and there was greater monitoring in preparedness for the next steps in learning. In contrast at Time 2, greater use of technology was reported for pupils with ASD. Year group differences were evident at Time 1 for reported 'use of extended examples' only. This strategy was used more commonly in Year 3 than Year 1. At Time 2, year group differences were only reported for 'greater opportunities to transfer learning'. This occurred more often in Years 5 and 7 than Year 9. There were no other significant year group differences.

Table 3.4. Percentage of reported strategy use for the pupils at Times 1 and 2

Strategy	Time	Never/rare	sometimes	often/ always
Allow extra practice with tasks	1	11	33	56
	2	11	36	53
Use extended examples	1**	10	21	69
	2	3	36	61
Monitor preparedness for next steps	1*	14	20	66
	2	6	20	74
Provide task related feedback	1	8	22	70
	2	1	19	80
Provide opportunities for transfer	1	17	26	57
	2**	18	39	43
Use checklist of steps	1	29	28	43
	2	24	37	39
Space short work periods	1	32	20	48
	2	16	34	50
Set an easier level of work	1*	17	22	61
	2	10	26	64
Provide different reminders	1	21	23	56
	2	20	21	59
Provide written and verbal instructions	1	13	23	64
	2	8	34	58
Allow use of computer or tape recorder	1	31	36	33
	2*	42	28	30
Limit the number of concepts presented at a time	1	11	19	70
	2	8	25	67

Notes: *significant cohort effect; **significant year group effect

Table 3.5. Factor structure for teachers' reported modifications of teaching and learning

	Time 1		Time 2	
	Factor 1 *Structure*	Factor 2 *Content*	Factor 1 *Structure*	Factor 2 *Content*
Variance %	48%	10%	45%	10%
allow extra practice with tasks	.55		.58	
monitor preparedness for next step	.55			.82
use checklist of steps phase 2	.70			
space short work periods with breaks	.78		.66	
inform students with different reminders	.66		.78	
Regular use of computer, tape recorder	.78		.67	
limit the number of concepts presented at one time	.59		.53	
use extended or additional examples		.80		.57
provide task related feedback		.75		.82
provide opportunities for transfer phase 2		.56		.72
setting an easier level of work		.75	.61	
provide written and verbal instructions		.56	.60	

We created two factors from the 12 curriculum differentiation strategies to reduce the number of variables to be analysed (see Appendix 9, separate Technical Annex for details). Table 3.5 presents the two factors with their component strategies. These factors, especially Factor 1 were generally stable over time.

We next examined whether these factors differed across the two cohorts at Time 1 and then again at Time 2 after controlling for nonverbal ability. There was a significant effect of *content* at Time 1 (greater differentiation for the LI cohort, p =.006), and a trend for a significant effect of *structure* at Time 1 (greater differentiation for the ASD cohort, p =.058). There were no significant differences between the cohorts at Time 2 for either factor but the power to detect differences was low.

We predicted that differentiation (as indexed by the factors) would be related to levels of autism characteristics (SRS), nonverbal ability, language skills and literacy. Correlations between the factors and the *Z* scores on these background measures are shown in Table 3.6. There are four points of note in the table. Firstly, although different respondents completed the questionnaires, the Time 2 *structure* factor is highly correlated with the Time 1 *structure* factor. The same relationship does not hold for the *content* factor. Secondly, there was a significant relationship between the SRS and the *structure* factor. This demonstrates that at both time points pupils who had higher scores on the SRS, that is demonstrated higher level of autism characteristics/behaviours, were receiving higher levels of *structural* differentiation. The SRS was not significantly related to any other measure. Thirdly, there were no significant relationships between nonverbal ability and the factors identified at either time point. Finally negative correlations were recorded for the standardised measures with the factor scores, although this varies between factors and time points. The greater the pupils level of language needs (as measured by the standardised assessments) the more likely teachers were to report making alterations to the content and the structure of their teaching (see Table 3.6).

Table 3.6. Correlations between derived factors (*content* and *structure)* and language and literacy *Z* scores

	1	2	3	4	5	6	7	8	9	10
1. Time 1 structure										
2. Time 1 content	-									
3. Time 2 structure	.42**	.36**								
4. Time 2 content	-.07	.06	-							
5.SRS	.37***	.06	.40***	.12						
6.Matrices	-.09	-.19	-.25	-.09	-.03					
7.CELF-4 UK RL	-.20*	-.31**	-.38**	-.29**	-.05	.52***				
8.CELF-4 UK EL	-.11	-.44***	-.23	-.35**	-.03	.31***	.73***			
9.Word reading	-.15	-.44***	-.34**	-.15	.01	.41***	.56***	.59***		
10.Reading comprehension	-.17	-.29**	-.16	-.22	-.13	.40***	.51***	.53***	.60***	
11. Spelling	-.15	-.36***	-.28**	.01	-.04	.34***	.31***	.30***	.81***	.40***

Notes: *$p < .05$, **$p < .01$, *** $p < .001$; RL = receptive language; EL = expressive language

Box 3.8. Summary from teacher questionnaires

- Teachers reported that pupils were receiving high levels of support from LSAs. In addition, for a significant minority of pupils, there was evidence of involvement by SLTs.
- Importantly, SLT involvement was significantly reduced for pupils in secondary schools. SLTs were also more involved with pupils with ASD than LI.
- Compared to LSAs and SLTs there was less direct pupil involvement by SENCOs and very little contact with EP services.
- Teachers reported on their use of 12 different strategies to support pupils' learning. There were few differences between the cohorts (LI and ASD) in use of these strategies, although pupils with ASD were more likely to receive additional IT support and pupils with LI were more likely to have their preparedness for the next step monitored.
- Factor analysis revealed two different factors – *content and structure*. These factors effectively refer to what is taught and how it is taught.
- Greater differentiation of *content* was reported for pupils with LI and there was a trend for greater levels of *structural* differentiation for pupils with ASD.
- These different patterns were more evident when we considered the relationship between factors and performance on standardised measures. Higher scores on the social responsiveness scale (greater level of difficulty typically associated with ASD pupils) were associated with higher levels of *structural modifications* whereas lower scores on the language and literacy measures (poorer performance more closely associated with LI pupils) were associated with more modifications in the *content* of what was being taught.

3.10. What did we observe during English language and literacy lessons?

Observations were carried out to examine the ways in which pupils were supported in class. We observed 158 pupils during their literacy/English lessons for a period of 20 minutes, recording occurred at each two minute creating 1580 observation points. Literacy/English lessons were chosen as the target lessons given the pupils' difficulties with language, communication, reading, and writing. The coding started ten minutes into the lesson to allow students to settle and teachers to outline the activities for the lesson. Table 3.7 provides details of the four categories used at each two minute time point. Codes were mutually exclusive.

As Table 3.7 shows, observations focused on four main dimensions: where the target pupil was located (five possible locations), with whom the target pupil was working(six possible groupings), whether the task was differentiated (not differentiated versus five categories of differentiation), and the extent to which the pupil was engaged with the classroom activity (engaged versus six types off task behaviour). Observations were taken every two minutes, thus for each pupil over the lesson there were 10 instances for each code for each dimension unless otherwise stated. The current analyses focus on the proportion of observations of the specific code for target pupils for each category. For example if a pupil was observed to be working with a LSA for all ten observation points a proportion score of 1 would be recorded. In contrast if a pupil was observed to be working with a LSA for three observation points a proportion score of .3 would be recorded. These were then averaged and means (*SDs*) reflect the distributions for cohorts or year groups.

Table 3.7. Behaviours coded during the observation period

Location	Who the pupil was working with	Task differentiation	Engagement
1. With class group	1. Whole class	1. Same task as class (not differentiated)	1. On task - passive
2. Working with an adult in the corner of a room	2. Large group (>5)	2. Differentiated - for individual	2. On task – active
3. Separated by a barrier in class	3. Small group (<6)	3. Differentiated – for group	3. Off task - passive
4. In class with LSA	4. Pair	4. Differentiated - different literacy task	4. Off task – chatting with other pupils
5. Withdrawal from class	5. Alone	5. Differentiated - other task to class	5. Off task - Looking away, at others
	6. With other staff	6. Special intervention - language or literacy	6. Off task - disruptive
			7. Off task - playing
			8. Off task – doing another task

We also coded the presence of particular autism features characteristic of children and young people with autism, the presence of repetitive and stereotyped behaviours (e.g., motor mannerisms), as well as examples of signs of stress or negative emotions such as

being upset or acting concerned. During the observation period the numbers of pupils in the class were counted and the position of the target pupil recorded. We also noted whether instructions were written on the board as well as delivered verbally, whether key vocabulary was on the board and whether visual resources e.g., mind maps were used to support what was being said.

3.10.1. The learning context of the classroom

The modal number of pupils in the class was 29 but this represented a wide range (1 – 42). For most pupils (87%) class size ranged from 20 to 30 pupils. There was no significant difference across the four cohorts (LI-av-NV, ASD-av-NV, LI-low-NV, ASD-low-NV) in their seating position in the classroom, in the classrooms observed 61 % were seated at the front of the class.

For 75% of the lessons observed teachers specified the lesson objective for the pupils. Activities were supported by writing key instructions on the board for 57% of lessons, writing key vocabulary on the board for 62% of lessons and by the use of visual aids (e.g., diagrams, pictures) for 46%. Typically if teachers wrote instructions on the board they also wrote key vocabulary on the board: in 53% of the lessons pupils had both key vocabulary and instructions on the board.

3.10.2. Pupils' location in the classroom

The coding system provided five alternatives for the pupil's location: in the main class, withdrawal in class working with an adult (other than an LSA), withdrawal separated by a barrier, working in class with the LSA, and withdrawal to another location. Over the 53 hours of observation for the 158 pupils we recorded no instances of a pupil being separated within the classroom by a barrier. Therefore, subsequent analyses consider the four alternate categories.

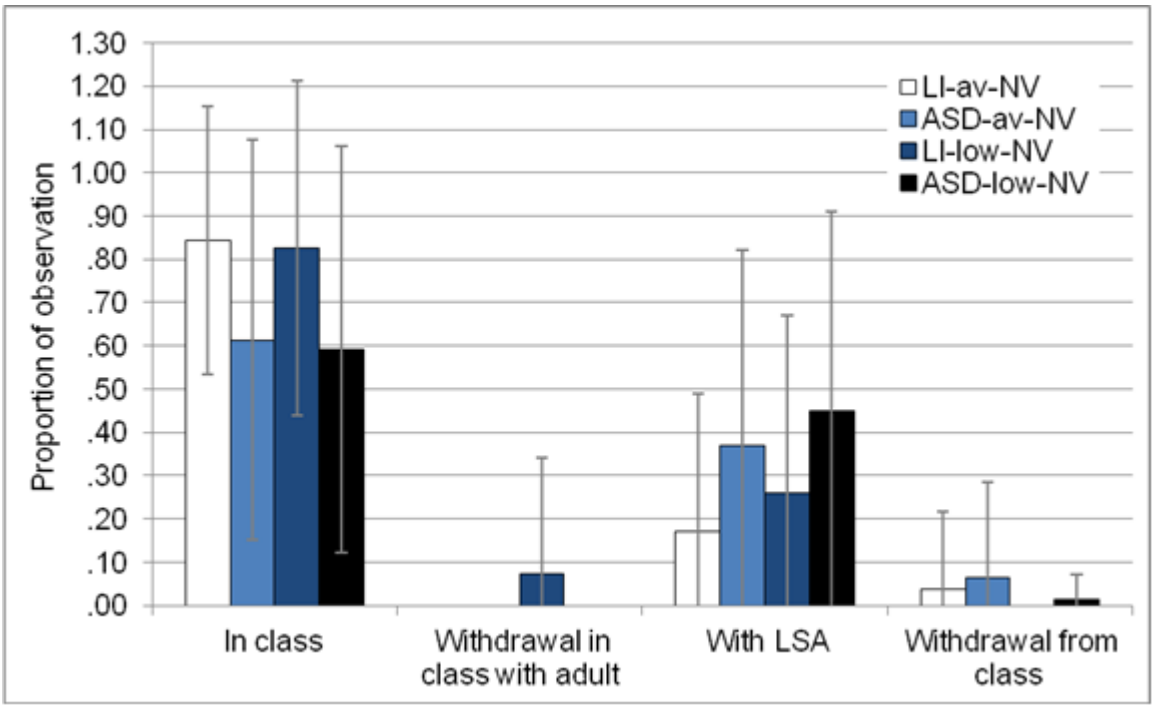

Figure 3.38. Mean (±SD) proportion of target pupil's location across the observation period

As Figure 3.38 shows, for the majority of the observations, pupils were in the mainstream classroom participating in activities with no additional support recorded. For this category the overall ANOVA between cohorts was significant. Post hoc tests indicated that the LI-av-NV cohort was significantly more likely to be working with the class than both the ASD-av-NV and ASD-low-NV cohorts while the LI-low-NV cohort was similar to the LI-av-NV cohort but differed significantly from the ASD-low-NV. The difference in their classroom location is captured by the parallel observations of the cohorts in terms of whether they were being supported by a LSA. Post hoc tests indicated that pupils with ASD-av-NV and ASD-low-NV were significantly more likely to be supported by a LSA than pupils with LI-av-NV. The LI-low-NV cohort did not differ from any other cohorts. Observations of withdrawal in class with an adult and withdrawal from the class were low and as Figure 3.38 suggests there were no differential patterns across the cohorts in these two categories.

We plotted the location of pupils with ASD and LI over the time frame of the observation period. These data are presented in Figure 3.39. As the figure shows pupils with LI are far more likely to be located in the mainstream group and not be working with a LSA. Whereas pupils with ASD across observation points are often working with a LSA. For the first nine time points pupils with ASD were significantly less likely to be located in the class than those with LI and significantly more likely to be working with a LSA than those with a LI (all Chi squares significant). At the final observation point pupils with ASD were also less likely to be

working in class but there was no significant difference in working with a LSA. There were no significant differences for other locations.

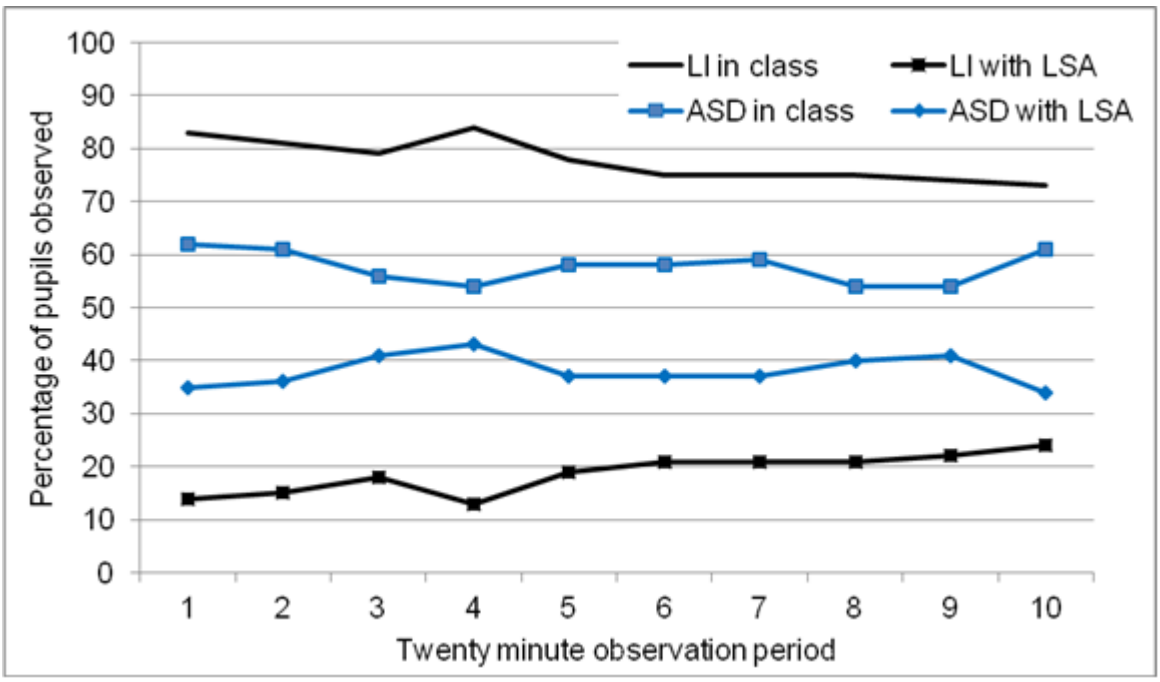

Figure 3.39. Changes in location (main class or LSA) for the pupils with LI and ASD over the observation period

We examined whether there were year group differences in pupils' placement in the main class or with working with a LSA as these two categories provided sufficient numbers of data points for statistical analyses. There were no year group differences, thus in no single year group were pupils in the current observations more likely to working in the main class or be supported by LSAs than in any other year group.

3.10.3. Who did pupils work with in the class?

We recorded five different working arrangements in the classroom when pupils were not working with an adult: whole class, large group, small group, in pairs, or working alone. At each time point pupils were coded as working in one context although over time, as would be expected, these working situations could change. As Figure 3.40 shows, over the observation points pupils were working in a variety of different contexts, the most common for all cohorts being whole class. The only significant cohort difference was for working in pairs. Pupils with LI-low-NV were significantly more likely to be working alone than pupils with ASD, there were no other significant differences between the cohorts for this working arrangement.

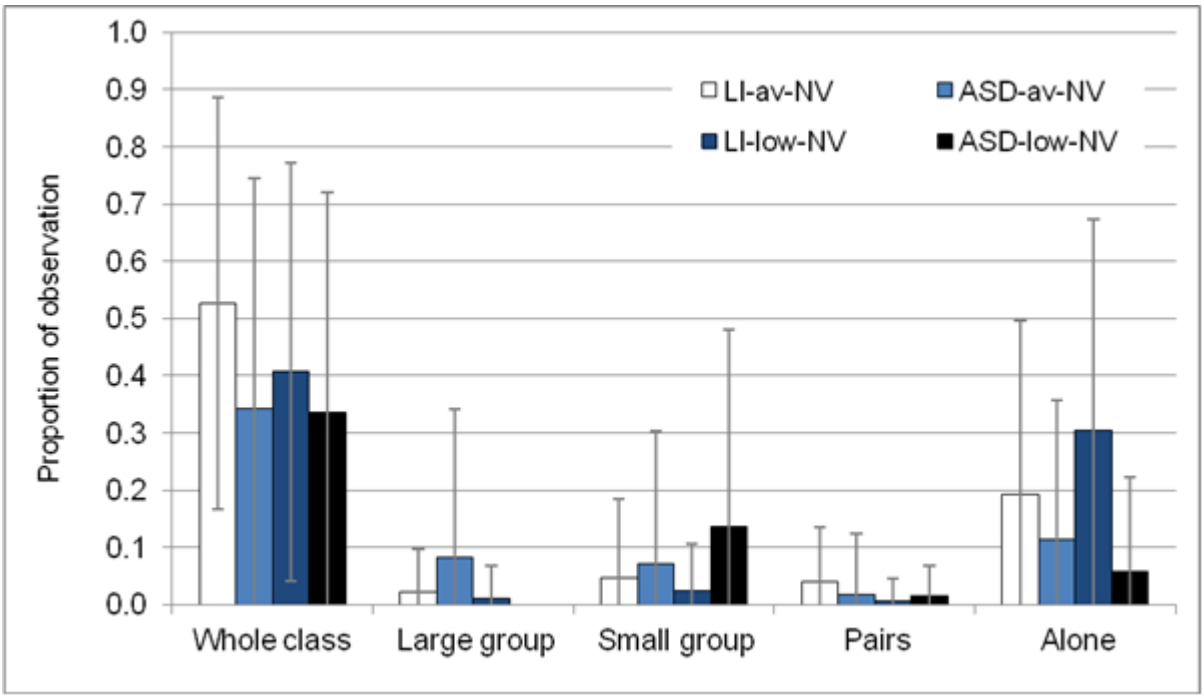

Figure 3.40. Mean (±SD) proportion of target pupil's working arrangements across the observation period

We examined whether there were year group differences for the most frequently reported working arrangements – whole class and working alone, where we had sufficient numbers. There were no significant differences between the year groups. We plotted pupils' working arrangements over the time frame of the observation period including where pupils were working with an LSA as a separate code and merging data for large and small groups. As Figure 3.41 shows, over the time period there was a trend for reduced whole class activities with a corresponding increase in working alone and a small increase in group work. The percentage of pupils working with LSAs remained fairly stable.

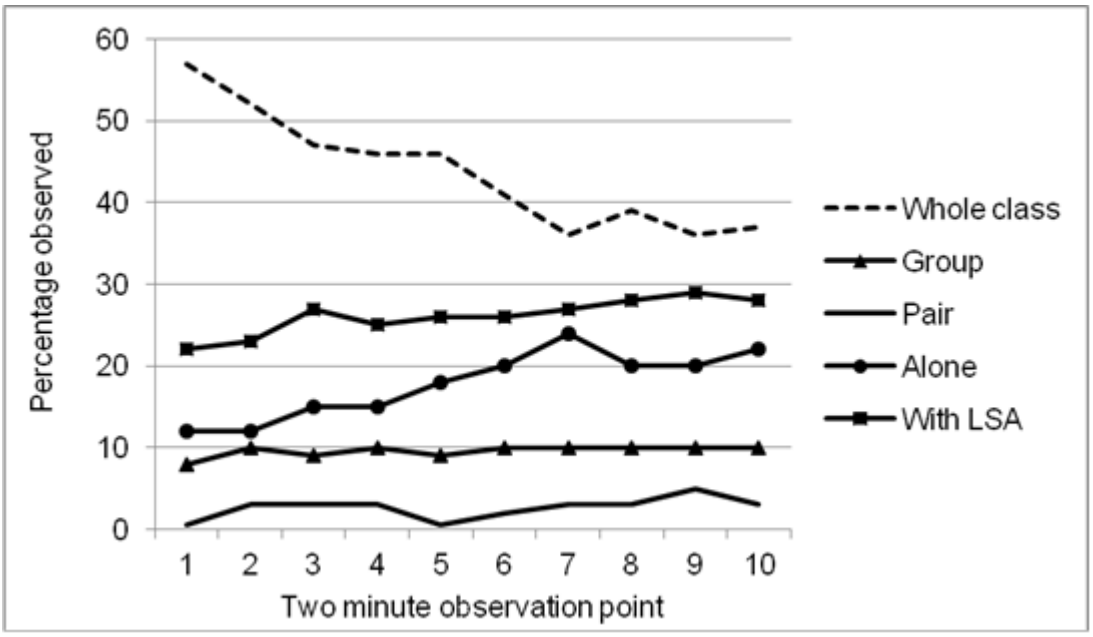

Figure 3.41. Changes in working arrangements over the 20 minute observation period

We considered whether the stability in the proportion of observations of pupils working with LSAs reflected the fact that LSAs were working with the same pupils over the time period. This was not the case. LSA's were observed working with 57 pupils (36% of all pupils observed). The LSA was working with 20 pupils for the ten observation points, eight pupils once and for the remaining pupils for between three and nine observation points.

3.10.4. Task differentiation

Teachers had previously reported a range of strategies used to differentiate activities for the target pupils (see Section 3.9.2). The observation sessions provided the opportunity to examine this in practice.

We first examined whether task differentiation occurred and whether this differed between the cohorts. Figure 3.42 provides details of the proportion of task differentiation across the observation points. There was a significant difference across the cohorts. Pupils with ASD-low-NV were statistically significantly more likely to have tasks differentiated than those with LI-av-NV and similar trends of increased differentiation for the ASD-low-NV in comparison to ASD-av-NV (p = .06) and LI-low-NV (p = .06) were also evident.

We hypothesised that there would be greater differentiation if the pupils were working with LSAs. However there was no statistically significant relationship between task differentiation and working with LSAs. We also hypothesized that pupils with poorer performance on measures of nonverbal ability, receptive or expressive language, single word reading or

reading comprehension would experience greater task differentiation. No correlations were significant (nonverbal ability *r* = .19, receptive or expressive language *r* = .05 and *r* =.03 respectively, single word reading *r* = -.01, reading comprehension *r* = -.03).

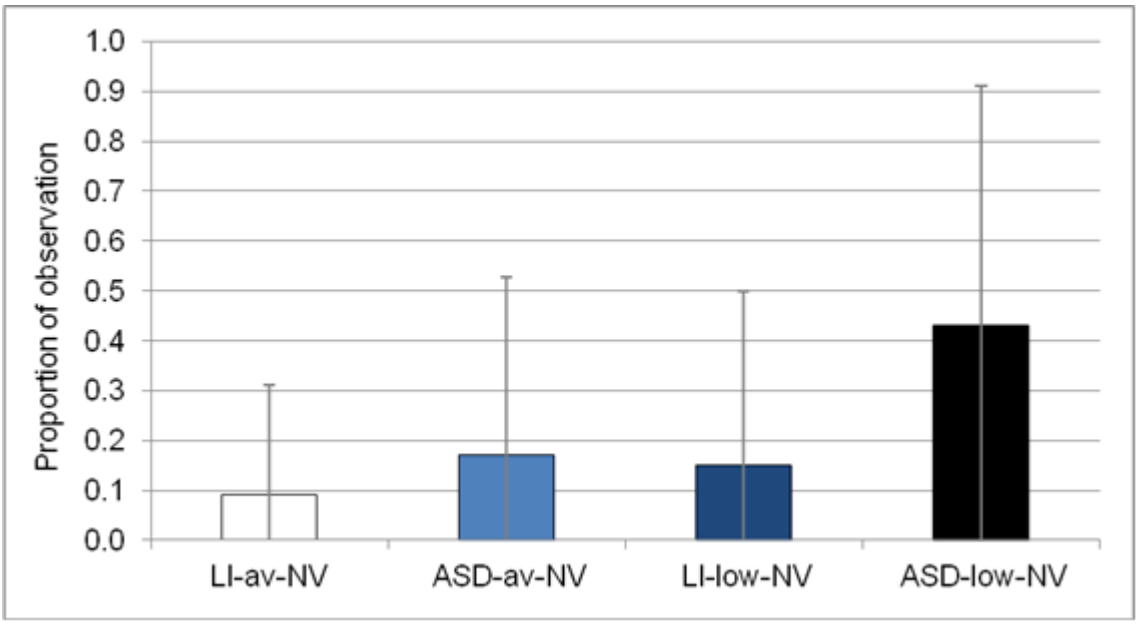

Figure 3.42. Mean (±SD) proportion of task differentiation across the 20 minute observation period

Where differentiation was observed we were able to consider the ways in which work was differentiated. Consistent with teachers' reports in Section 3.9.2 we observed no use of specialized language or literacy programmes. Nor did we observe any pupil who was working on tasks other than those set for the lesson. We considered whether differentiation was observed at a pupil level, that is individualized, at a group level or for literacy specifically given the curriculum subject observed (Literacy/English). We recorded four instances of literacy being differentiated throughout the observations, these observations reflected one pupil from each cohort. In contrast individual and group differentiation was recorded for more pupils. Figure 3.43 presents the percentage of pupils for whom individualized or group differentiation was observed. Numbers are too small for statistical analyses but as Figure 3.43 shows pupils with ASD-low-NV were more likely to have individual variation. In contrast group differentiation is recorded for 10% of all the cohorts.

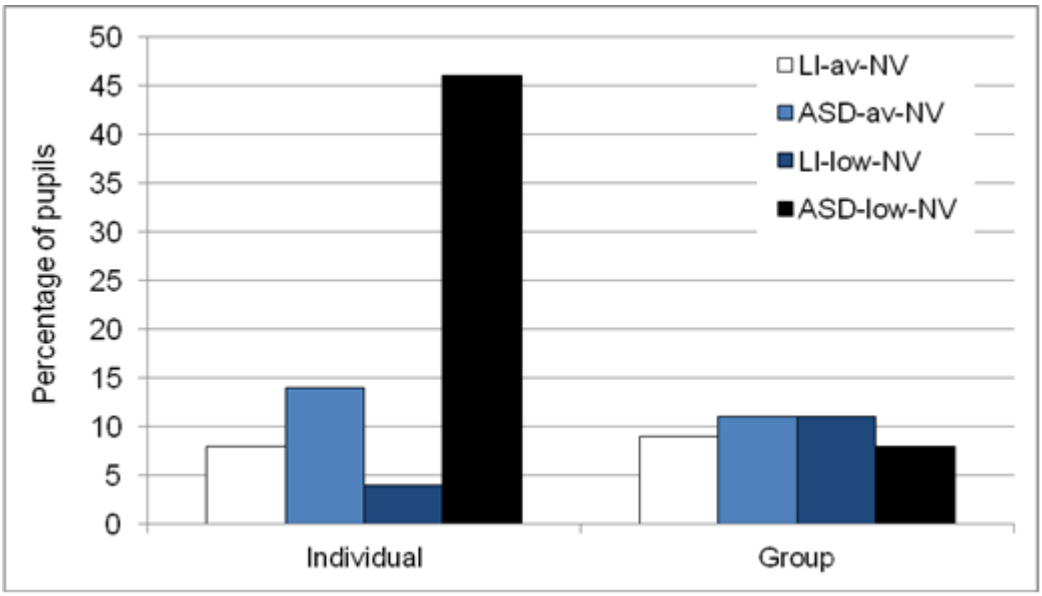

Figure 3.43. Percentage of pupils by cohort for whom individual or group differentiation was observed

3.10.5. Pupil engagement

Pupils' on task and off task behaviour was recorded at each observation point. Engagement was defined as on-task behaviour. Figure 3.44 presents proportion of engagement with the classroom tasks. Pupils were generally engaged with the task (around 70% of time) and there were no significant cohort differences. However, there were year group differences. Independent of cohort pupils in Year 7 were significantly less likely to be engaged than pupils in Years 5 and 3.

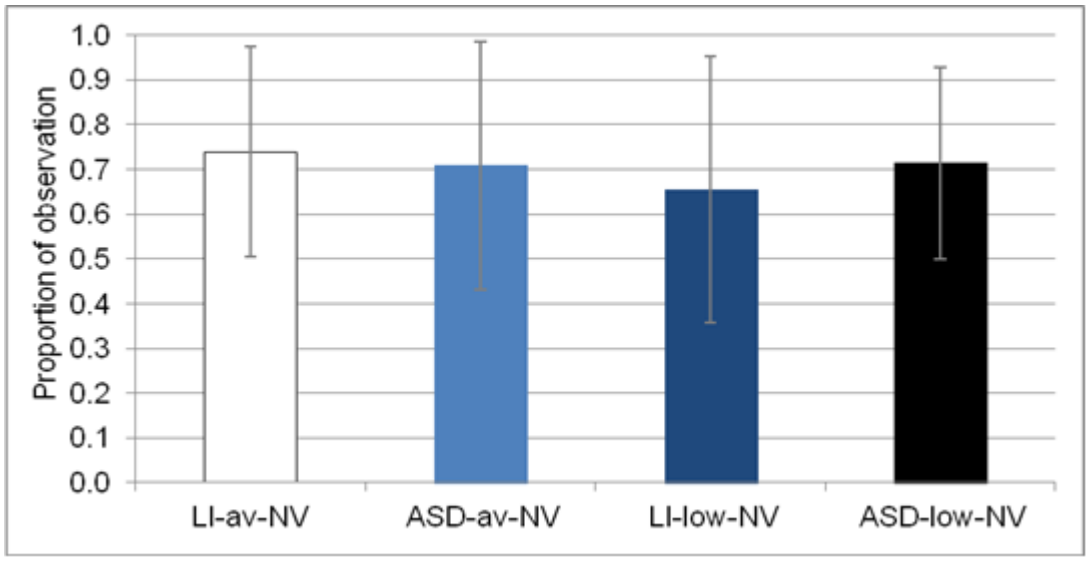

Figure 3.44. Proportion of observation points for which pupils were engaged with the task

We considered what pupils were doing when they were not engaged, that is off task behaviour. The proportion of off task observations is shown in Figure 3.45. As Figure 3.45 shows, the majority of off-task behaviour was being passive or looking away/around the room, very little disruptive behaviour was noted. There were no statistically significant cohort differences. We examined year group differences. There was a significant effect of year group for 'chatting'. Pupils in year 7 were observed to be chatting with peers more often than pupils in years 3 and 5. No other yeargroup differences were significant. However, the actual observations of chatting were low. We hypothesized that pupils' off task behaviour might be associated with poorer performance on measures of nonverbal ability, receptive or expressive language, single word reading or reading comprehension. No correlations were significant.

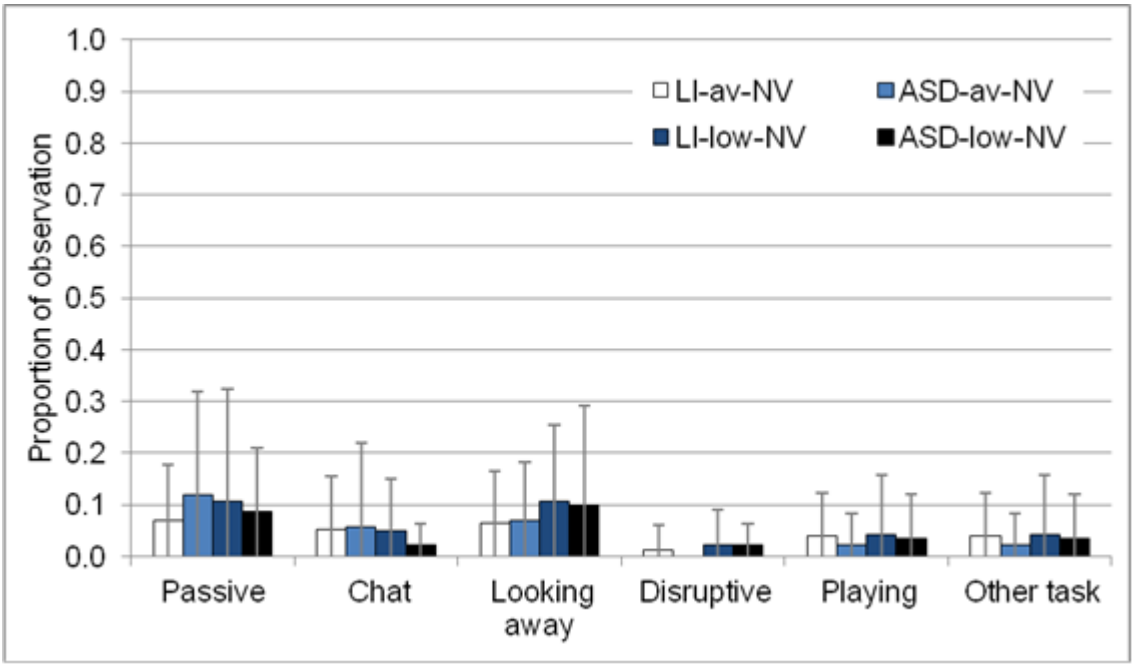

Figure 3.45. Proportion of off task behaviours across cohorts

3.10.6. Observation of autistic features

Occurrences of both repetitive/stereotypical behaviour and stress/negative emotions were infrequent. Nonparametric statistics (Mann-Whitney U) were used to examine differences in occurrence of these behaviours between LI and ASD cohorts. Both sets of behaviours were more evident in pupils with ASD (repetitive/stereotypical, p =. 001; stress/negative emotions, p =.02). As the box plots in Figure 3.46 show, for pupils with ASD at least one instance of repetitive behaviour occurred for a substantial number of pupils whereas for the LI cohort these occurrences occurred for a minority of pupils (ASD = 40%; LI = 9%).

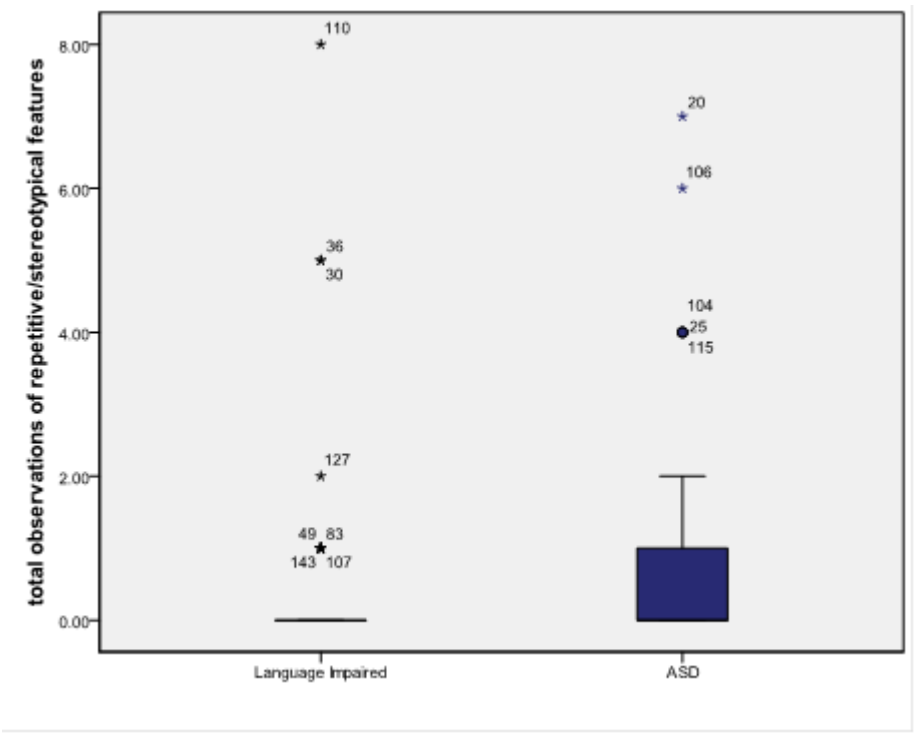

Figure 3.46. distribution of repetitive behaviours by cohort

We expected that autistic features would be associated with teachers' ratings on the SRS and examined whether there was an association between presentation of these autistic features and scores on the SRS. We also examined the relationship with composite measures of receptive and expressive language as pupils with poor language skills may find the classroom setting more challenging; these are presented in Table 3.8. Signs of distress and repetitive behaviours were not associated. However, as the table shows, there was a significant relationship between occurrences of repetitive/stereotypical behaviours and SRS scores, indicating that the more impaired pupils' scores were on the SRS the greater likelihood of presenting with repetitive behaviours in class. The relationship between signs of distress and receptive language were not as anticipated: here there was a positive association between receptive language and signs of distress, indicating that pupils with higher levels of receptive language were observed to be more distressed at the points observed in the lessons.

Table 3.8. Non parametric correlations between observations of autism features, language and autism symptomatology

	1	2	3	4
1. Observations: distress and negative emotions	-			
2. Observations: repetitive and stereotypical behaviour	-.17*			
3. Receptive language *Z* scores	.17*	-.01		
4.Expressive language *Z* scores	.09	-.16	.64***	
5. SRS *Z* score	.16	-.20	-.12	-.01

*$p < .05$, *** $p < .001$

Note. SRS = autism symptomatology as assessed using the Social Responsiveness Scale

Box 3.9. Summary of observations

- To our knowledge there are no observation data comparing the classroom learning context for pupils with LI and ASD in English language/literacy lessons. These lessons were targeted for observation because we had predicted that the content of the lessons would be particularly challenging for our participants. Also, these were lessons where we expected to see greatest levels of support and differentiation.
- Apart from reduced engagement and increased chatting in Year 7 pupils, we found no year group differences.
- We found significant differences between the LI and ASD cohorts on a number of measures although large standard deviations for the cohorts were common.
- For the majority of the observation period pupils were in the mainstream classroom. However, pupils with ASD were significantly more likely than the pupils with LI to be working with an LSA in the classroom or to be working outside the classroom.
- Over the observation period, pupils experienced a variety of working arrangements. Here we found that, as might be expected, there was a reduction in whole class activity over the observation period. When pupils were not engaged in whole class teaching they tended to work alone or with a LSA rather than in groups or in pairs.
- Observations of task differentiation and off task behaviour varied within and between cohorts. Pupils with ASD-low-NV were significantly more likely to have the curriculum differentiation at an individual level. Differences in the pupils' scores on standardised measures did not account for this variation. There were no significant correlations with the measures of language, literacy or cognition.
- Overall, the pupils were observed to be engaged with the lessons they were in and again we found no significant correlations between levels of engagement and the measures of language, literacy or cognition. There was little evidence of disruptive behaviour or pupils being engaged in tasks, which were not relevant to the lesson.
- Finally, we recorded instances of particular features of ASD. These were significantly more likely to be recorded for pupils with ASD but also occurred in the LI cohort. Repetitive and stereotypical behaviours observed were significantly associated with scores on our screening measure of autism symptomatology.

3.11. What do SENCOs report about how pupils are supported and what this costs?

SENCOs completed a questionnaire at Time 1 and Time 2 to describe the amount of time allocated to specialist provision within the school and by external professionals. Data were reported in hours per week for in school support and hours per term for external

professionals and administration time. SENCOs completed questionnaires at Time 1 (72% response rate; *n* = 118, LI = 74, ASD = 44) and at Time 2 (57% response rate; *n* = 93, LI = 50, ASD = 43).

3.11.1. The data

In the following tables, we report the numbers of hours for each type of support that SENCOs indicated was provided. Not all questions were answered, despite the request to do so. Unanswered questions may indicate that the support detailed was either not available or not provided but equally may reflect that in some cases this information was not known or readily accessible. For comparative purposes, we report the number of pupils for whom the item was completed in each table. In many cases, the data were skewed as some pupils received high numbers of hours and some no support. The tables report both mean (*SD*) and median hours to help capture this variation. Despite the questionnaire being filled in by different respondents, the patterns of results show similarities across both time points. Therefore, we present the hours provided by type of support for both time points together.

3.11.2. Weekly in-school support

As Table 3.9 shows, LSAs provide the highest numbers of hours of support per week both in groups and one to one. SENCOs were typically not reported to be involved in much direct support with pupils. This is consistent with teacher questionnaires and the observations results (see 3.9.1 and 3.10.3). Pupils with ASD were reported to receive more one to one support at both time points and this was statistically significant at Time 1 Mann-Whitney U = 1,044, p <.001). Again this was consistent with the classroom observations reported in Section 3.10.2. There were no other statistically significant group differences. There were no differences in the reported amount of time, an average of four hours per week, that the pupils were spending in resources bases.

Table 3.9. Reported hours of support in school at Time 1and Time 2

	LI			ASD		
	n reported	Mean (*SD*)	Median	*n* reported	Mean (*SD*)	Median
Time 1 (hours per week)						
LSA 1 to 1	43	4.48 (6.10)	2	34	14.47 (12.1)	14.75
LSA – group	58	6.79 (5.90)	5.5	26	5.63 (5.5)	5
In resource base	40	4.63 (8.83)	.20	22	7.27 (10.09)	.50
SENCO 1 to 1	37	.38 (.70)	0	19	.26 (.45)	0
SENCO - group	46	.59 (.86)	0	24	.50 (1.42)	0
n questionnaires received		74			44	
Time 2 (hours per week)						
LSA 1 to 1	35	4.72 (7.89)	1	32	9.78 (10.78)	3.75
LSA – group	38	4.99 (5.81)	3	30	6.98 (8.96)	3
In resources base	33	4.21 (7.79)	0	20	2.09 (3.66)	1
SENCO 1 to 1	34	.29 (.96)	0	22	.14 (.35)	0
SENCO - group	35	.31 (.54)	0	24	.23 (.78)	0
n questionnaires received		50			43	

Notes: LSA= Learning Support Assistant; SENCO= Special Education Needs Coordinator.

3.11.3. Termly support from professionals external to the school

Reported involvement by Educational Psychologists (EPs), community paediatricians, Education Welfare Officers (EWOs) or school nurses was rare. At Time 1 EP involvement was reported for 17 pupils of whom 13 were in the LI cohort and four in the ASD cohort with involvement typically being one hour to two hours per term. The community paediatrician was reported to be involved with two pupils, both ASD. The EWO was involved with one pupil and the school nurse with two pupils. At Time 2 there was no reported involvement for EPs, Community paediatricians, or EWOs. The school nurse was involved with one pupil at Time 2. Some respondents reported that these professionals would be involved when (if) required.

In contrast, as shown in Table 3.10 SLT involvement was reported for both cohorts, typically either 1-1 or in groups. Pupils with ASD received more one to one SLT support and more SLT group work at Time 1 and this difference was statistically significant for group work (Mann-Whitney U = 946, p =.01). There were no other statistically significant group differences. Given that teachers had reported much less SLT involvement (see section 3.9.1) in secondary schools we repeated these analyses examining year group effects. At both Time 1 and Time 2, pupils in secondary school were significantly less likely to receive one-one SLT support (Time 1 Mann-Whitney U = 398.5, p =.02; Time 2 Mann-Whitney U = 283.5, p =.03). There were no other significant differences.

Table 3.10. Reported hours of support by speech and language therapists at Time 1 and Time 2

	LI			ASD		
	n reported	Mean (*SD*)	Median	*n* reported	Mean (*SD*)	Median
Time 1 (hours per term)						
SLT 1 to 1	53	2.30 (3.62)	1	30	3.33 (5.78)	1.5
SLT - group	39	1.01 (2.56)	0	22	4.32 (6.04)	1.5
SLT clinic	39	.32 (1.15)	0	22	0	0
n questionnaires received		74			44	
Time 2 (hours per term)						
SLT 1 to 1	30	.23 (.50)	0	25	.28 (.52)	0
SLT - group	28	.09 (.24)	0	18	.17 (.38)	0
SLT clinic	25	0	0	23	0	0
n questionnaires received		50			43	

Notes: SLT= Speech and Language Therapist.

3.11.4. Administrative time per term spent by school staff

Table 3.11 provides information on the number of hours of administrative time spent by SENCOS, teachers and head teachers per term. The reported administrative time by head teachers shows little variation across the two time points. However, for both groups administrative time by SENCOs and teachers was higher at Time 1 than Time 2. The only statistically significant difference between the cohorts was for head teacher involvement at Time 1 where there was more reported administrative time for pupils with ASD (Mann-Whitney $U = 882.5$, $p = .01$).

We considered whether administrative time varied between primary and secondary school. In all cases more time was spent when pupils were in primary school but the difference was only significant at Time 2 for SENCO administrative time (Mann-Whitney U = 640.0, p =.009).

Table 3.11. Administrative time reported for target pupil by school staff at Time 1 and Time 2

	LI			ASD		
	N reported	Mean (*SD*)	Median	*N* reported	Mean (*SD*)	Median
Time 1 (hours per term)						
SENCO	59	3.41 (3.84)	2	34	2.78 (3.34)	2
Teacher	58	2.53 (3.16)	2	33	3.17 (2.84)	2
Head teachers	39	.49 (1.02)	0	19	1.11 (1.28)	1
n questionnaires received		74			44	
Time 2 (hours per term)						
SENCO	35	.95 (1.6)	.5	27	3.24 (3.83)	2
Teacher	33	.96 (1.49)	.5	25	1.37 (2.11)	1
Head teachers	26	.35 (.78)	0	16	.06 (.25)	0
n questionnaires received		50			43	

Notes: SENCO= Special Education Needs Coordinator

3.11.5. Use of specialist programmes

SENCOs were asked about expenditure on specialist programmes. Based on the teacher responses and the observational data, we had expected to see little evidence of this. Additionally, there was a strong tendency for SENCOs to neglect to answer these questions. Therefore, findings are difficult to interpret. Costing for specialist programmes was reported

for 11 pupils in the LI cohort and three in the ASD cohort at Time 1. Costs of programmes ranged from £30 to £3,000. All but two programmes were estimated at £500 or less. At Time 2 there were costs provided for three pupils (all LI) with a minimum cost of £20 and a maximum cost of £150. The specialist programmes reported included those relating to intervention for literary and numeracy ('Sound Phonics Programme'; Toe by Toe'; 'Lexia reading software'; 'Sam learning'; 'Handwriting without tears', 'Wave 3 programme') and the promotion of socio-emotional and life skills ('Friends for Life', 'ASDAN Transition Challenge').

Box 3.10. Summary of SENCO responses

- SENCOs provided data about the resources provided for the target pupils. Pupils with ASD were reported to receive more LSA time than pupils with LI (Mean LI Time 1 =5 hours, Mean ASD Time 1= 15 hours). There was also evidence of more involvement by SLTs for pupils with ASD. These trends confirm the teachers' reports and the classroom observations.
- We also found a significant difference between primary and secondary schools for SLT support, where there was more one to one involvement by SLTs in primary schools.
- Data on other professionals was sparse and suggested that there was limited direct involvement for our target pupils. It is possible that SENCOs were not aware of this involvement or that the professional involvement was of a different nature, for example at a strategic school level. Nonetheless it suggests that the primary supports for our participants are school based and through SLTs.
- The amount of administrative support provided for the pupils with LI differed across the two time points. It is unclear why these differences in reported hours occur. At Time 1 the average school administration time for LI pupils was six hours per term but at Time 2 this reduced to three hours per term. There was more stability in the time reported to be allocated to pupils with ASD per term (Time 1: 6 hours and Time 2: 4 hours).
- Consistent with our previous data there was little expenditure on special programmes.

3.12. What are parents' perspectives on their children's development?

In this section, we present the perspectives of the parents of our participants. The BCRP included a specific theme on parental perspectives with an emphasis on their preferred

outcomes for their children[28] [29]. Our findings complement those other BCRP studies, drawing specifically on our parents of pupils with LI or ASD.

A total of 139 interviews were conducted; the parents not interviewed did not respond to phone calls, voice mail messages or emails, had gone abroad, or had personal difficulties and so declined to be interviewed.

Interviews were conducted by phone with the 139 parents who agreed to take part in order to discuss their perspectives on their child and the support received. Most (93%) were mothers but 7% were fathers/partners. The interviews were pre-arranged and typically lasted about one hour. These parents represented a good coverage of the four cohorts: 58 (78% of the LI-av-NV cohort), 46 (90%) of the ASD-av-NV cohort, 24 (80%) of the LI-low-NV cohort and 11 (69%) of the ASD-low-NV cohort[30]. We also achieved good coverage by gender of child (parents of 83% of the girls and 73% of the boys) and type of schooling (83% of the 104 children in mainstream and 76% of the 33 children in specialist resources). There were no significant differences between the children whose parents were interviewed with respect to 9 out of 11 individual assessment measures except for two language scores (the CELF-4 UK expressive and receptive language) where the children whose parents were not interviewed had significantly lower scores.

This element of the Prospective Study was largely qualitative, allowing parents to explore with us their perspectives on the topics we discussed with them. Our semi-structured interview schedule also allowed us to derive quantitative data.

We generally report the results of the questions that allowed us to analyse results quantitatively (e.g. rating scales of satisfaction) by LI and ASD cohorts or type of provision the child attended, and report statistically significant differences where these occur (using Chi Square). We follow the same approach when reporting parents' comments. However, we report the cohort for the child (e.g. LI-av-NV) when this level of detail is particularly useful. Similarly, we also report the child's age group where this is relevant. Quotations are used to illustrate the issues discussed. These have been carefully selected as representative of

[28] Roulstone, S., Coad, J., Ayre, A., Hambley, H., & Lindsay, G. (2012) *The preferred outcomes of children with speech, language and communication needs and their parents.* London: DfE.

[29] Roulstone, S. & Lindsay, G. (2012) *The perspectives of children and young people who have speech, language and communication needs, and their parents* London: DfE..

[30] We present percentages of parents who responded to the questions being reported although, as shown, these were overwhelmingly mothers.

either a general parental perspective or as an outlier view that makes an important (even if infrequent) point clearly.

As this section has a large qualitative element, it is important to stress caution in seeking to quantify responses. In some cases (in response to direct questions or ratings), quantitative data are reported, with percentages rounded to whole numbers. However, data from the interpretation of comments are reported in a more general way to reflect this data source. In these instances we provide quantitative data in the form of fractions (e.g., 'a quarter', 'tenth'), proportions (e.g., four out of ten parents') or percentages rounded to 10%, 20% etc.

We report our findings in four sections: parents' initial concerns about their child; the characteristics of the first support they received; their views on their child's current development, special needs and the support provided to meet those needs; and finally their views on their involvement in decision-making about their child.

3.12.1. Initial concerns

Half of the 131 parents who provided a response (51%) reported that concerns had been raised either by themselves or by others, by the time the child was 2½ years old. In the majority of these cases (64%) it was the mother alone followed by 17% of children where both parents identified concerns. Health visitors were reported to have been the first person to raise concerns in just 4% of children. In only one case was the father alone mentioned as the person who had originally raised concerns, but this may reflect, in part, the predominance of mothers as interviewees.

Among the parents of children with LI in this early identification cohort, the most common concern was with speech and language development. Often this was a result of comparison with an older sibling, either because they had been further advanced at the same age or had had similar difficulties, which had been identified. One parent commented that the "GP said she would grow out of it." (LI), a comment that was at one time worryingly common for practitioners to be told, but reported by only one parent (6 year old) in our study.

Parents of children in the LI-low-NV cohort were more likely to refer to a later identification, for example, "At 3 ½ to 4 years – in pre-school playgroup the leaders thought he had speech difficulties, expressive language difficulties or hearing difficulties." (LI-low-NV). However, this mother had not previously been concerned as he was a 'very good, quiet boy', a feature also reported by many other parents in this cohort.

Many of the parents of children in the ASD cohorts also referred to speech and language delays as worrying signs, either alone or in association with behavioural problems. One parent of a 12 year old with ASD had noticed problems when their son was about 2 ½ years old: “He was delayed, had no inhibitions, his language was late developing and his behaviour was difficult as he was uncooperative in the nursery, wouldn’t sit still and listen.” As a result, she was concerned he had ASD. Another parent commented upon her child’s behaviour problems and obsessions when in the reception class. A third parent had noted difficulties when her child was younger and a friend who had been an ASD teacher supported these.

Across the parents of children in the ASD cohort, it is striking to note the wide range of stories told by the parents.

One mother, who had other children with SEN, noticed that at 3 months, ‘he was very expressionless, miserable and unhappy’. Another mother knew her child was different, but noticed this at about 18 months:

> ‘He was very clingy and cried. He didn’t share, was late learning and had behaviour issues at school.’ (ASD)

In a third case the mother noted difficulties with eye contact at 12 months. She worked away a good deal and commented that the grandmother and husband had not noticed – she considered her husband may have ASD. Another mother, however, had not been sure at 2 years as he was a first child: a GP referral led to a diagnosis of autism.

As noted above, the parents of children with language impairment generally referred to language difficulties or slower development in a minority of cases. Among the ASD cohort, however, parents referred, in addition, to lack of inhibition, concern about deafness, sleep problems, general delay (walking and talking), screaming, rocking, lack of eye contact, and lack of inclusion in games (see also Kozlowski, Matson, Horovitz, Worley and Neale, 2011).

Parents of children with ASD also commented that they knew something was wrong but did not know what; for example, one mother commented that ‘I suspected from the beginning’. One of her twins, who had been born prematurely, was ‘always a concern’, a difficult boy who screamed and was sensitive to clothing. However, another parent said that her child had been a ‘very placid baby’ who would not reach for toys and had no pincer grip.

Regression was only mentioned by one mother who reported that her child was the easiest of her four children, had satisfactory milestones until he was two years and then regressed.

All except one of the parents of children in the ASD-low-NV cohort reported that they had concerns when their child was young. One, who had other children with SEN, said she noticed difficulties at 3 months, another noticed problems at 6 months, as she was able to compare him with his brother, who was born 16 months before him.

What is very apparent from the parents' descriptions is the importance of language difficulties across both cohorts but the much more common reference to a range of - different – concerns about aspects of behavioural development between the two ASD cohorts.

Concerns about the remaining children were mainly raised during the 2½ to 5 year age range (34%). Again, the mother most frequently raised these: alone (40% of these instances), with the father in a further 20% and together with a preschool worker or school teacher in a further 9%. In addition, the first person to raise concerns was identified as a preschool professional or school teacher in 8% of cases overall. Only two fathers were mentioned specifically as the first person to raise concerns and in one of these, it was in collaboration with the teacher.

3.12.2. First support

All the parents were able to identify the first person with whom they had discussed their concerns about their child's developmental difficulties. The parents' accounts varied with respect to this being an assessment or intervention. In the case of an assessment, the family doctor (25%) or a health visitor (22%) for younger children most commonly undertook this whereas it was the school for older children (32%). SLTs were identified in the case of 18% of children but here the parents referred to intervention rather than assessment and onward referral.

Most parents identified one or more professionals that had been involved at this early stage. General practitioners and health visitors were mentioned when concerns were raised when the child was young; nursery and school staff when the child was older. Many children were then referred onto a child development clinic and some to the child and adolescent mental health service (CAMHS). Very rarely did a parent indicate no action although one parent simply said 'No one', (LI) and another commented that her GP wasn't helpful because 'all children are different'.

There were differences between the parents with respect to the involvement of professionals at this early stage. SLTs were the most frequently mentioned professionals but whereas this was the case for about half of the parents of children with language impairment (47%), for those in our ASD cohorts the numbers were much lower (17%). By contrast, community paediatricians were mentioned by almost half of parents of children with ASD-av-NV (46%) but by less than a tenth of parents in the other three cohorts. EPs were specifically mentioned by only 5% of all parents, from across the cohorts.

When discussing an assessment as a first support, a substantial minority of parents referred to a diagnosis as an outcome. Parents were not specifically asked whether or not their child had received a diagnosis, however. Although other diagnoses were mentioned occasionally, including ADHD, dyspraxia, hearing impairment and epilepsy, the main diagnosis mentioned was ASD, including autism and Asperger's syndrome: a third of parents of children with ASD-av-NV and 6 of the 11 parents of children with ASD-low-NV. In addition, two children with LI had also been diagnosed with ASD. It is also of interest also to note that a substantial proportion of parents of children in the ASD cohort did not mention a diagnosis.

Children with ASD but average or above nonverbal ability were most likely to have received support before school: 61% compared with about 40% for the other three cohorts. Many parents referred to pre-school provision (nurseries, playgroup). With respect to specialist support, this was primarily provided by SLTs: about half of children with LI and a third of those with ASD.

However, this varied greatly in quantity and intensity. For example, for children with LI-av-NV:

'Six week blocks and then a break, then another six weeks.'
'Twice a week, then once a week, then school.'
'About once a week.'
'Seen by an SLT twice only.'
'Once a month until school.'
'Two or three or four times.'

There was a similar diversity among the ASD-av-NV cohort, for example:

'One visit from the SLT.'
'Two years of help.'
'Once a week in nursery.'

‘Met for one year every week and then less often when (child) was 3-4 years.’

And for the LI-low-NV cohort:

‘SLT only went twice.’

‘Speech and language therapy for three years.’

‘Only a few sessions.’

Parents of children in the two ASD cohorts also mentioned other support. One parent had found a behavioural psychologist very helpful, behavioural support teams had supported two children but these were the exceptions. Overwhelmingly, where support was provided at preschool, in addition to nursery or other day provision, it was from an SLT.

However, some parents had received no preschool provision, as indicated by these parents of children with LI:

> ‘No speech and language therapist at all – now the SLT will only see (child) in the holidays.’ (LI)

> ‘No one wanted to know. I saw the GP, psychologist and SLT but they didn’t want to help.’ (LI)

> ‘We saw an SLT at five years but there was no treatment.’ (LI)

Lack of active support (i.e. interventions rather than assessment) was reported more commonly by parents in the ASD-low-NV cohort – a third of whom commented that they had received no support pre-school.

3.12.3 Satisfaction with preschool support

The level of satisfaction among the parents of children in the LI and ASD cohorts was very similar (63% and 61% of those responding). Those that were satisfied referred to preschool provision, SLTs, health visitors and occasionally another professional. They made comments such as: ‘Made a big difference’ (LI), ‘Helped a lot’ (LI-av-NV), ‘The TA was fabulous’ (ASD-av-NV), ‘The nursery gave him all the help he needed’ (ASD).

Dissatisfaction focused mainly on lack of both general and, more particularly, specific specialist support. Some parents reported a general concern, such as ‘There was no help for

(child)' (LI) and 'It would have been nice to have had some help' (ASD). Other parents were more specific in their concerns:

> 'I thought the school would help – there was help but no specialist help.' (LI)
>
> 'Not enough SLT.' (LI)
>
> 'Basically the school were given the diagnosis from the paediatrician but couldn't cater for her needs.' (ASD)
>
> 'Lousy (private) nursery. The NHS has gaps, for example SLT services.' (ASD)

In the last example the parent was concerned that although she had been offered SLT support she had to wait two to three months and so contacted an independent SLT.

Some parents expressed both positive and negative comments:

> 'The quality of support from SLTs was fantastic – but not the amount'. (LI)
>
> 'Very happy with the SLT – very dissatisfied with the school'. (ASD)

Box 3.11. Initial identification and support

- The large majority of parents had experienced significant concerns before their child was 5 years.
    - Half of our parents had such concerns about their child by the age of 2½ years.
- Typically these were mothers –
    - Only 4% reported that a health visitor was the first to raise a concern.
- Parents of children with LI or ASD both indicated that their first focus of concern was speech and language development.
- Parents in the ASD cohort mentioned both autistic behaviour features and also references to general concern about their child's behaviour, in some cases from 12 months or less.
- Parents of children with ASD also made comments about knowing that something was wrong, but not being sure what.
- Early support was more likely to have been provided by an SLT for the children with LI, but a community paediatrician for those with ASD.
- Often support was in fact assessment – indicating that this process was itself seen as 'support' by parents.
- Assessment was often linked to a diagnosis of children with ASD but not those with LI – although two of the children with LI had also received a diagnosis of ASD.
- The support provided varied greatly. Typically, it was of SLT input but this varied in intensity and frequency.
    - Whereas one parent reported early years SLT support for three years, another child had received support only twice.
- Support for children with ASD was also typically from an SLT, indicating the central importance of SLTs for under-five children with both LI and ASD.
    - As a matter of concern, a minority of parents had received no SLT support.

3.12.4. Current development and support: Identification of special educational needs (SEN)

The large majority of parents (*83*%) considered their child to have SEN (range 79 – 91% across the four cohorts). However, this recognition was more common among parents of children within the combined ASD cohorts, than the combined language impaired cohorts.

Reference to speech, language and communication difficulties was much more common among the parents of children in the LI cohorts. For example, a parent of a 6 year old child with LI commented that her child 'Cannot speak well, can't pronounce words' and a second parent noted of her 6 year old 'Speech needs improvement – drops the beginnings of words off'. A third commented that her child's spoken language was 'not always clear, for example 'I want to go to she's house'". Another parent described her 6 year old child's language difficulties in terms of their recent improvement: '(child) wouldn't say a sentence and you couldn't understand him: he understood but couldn't talk (and) used sign language'.

The changing patterns of a child's difficulties with age were also noted. A parent of one 8 year old (LI) commented that '(child) has speech delay/disorder – (it's) more apparent now'.

In comparison, parents of children with ASD rarely mentioned speech, language or communication per se. Two parents were exceptions:

> 'She has speech problems, she can't express herself as clearly as she would like' and '…
>
> '… because of his language. (He's) still not perfect in some of the ways he speaks, he's not really clear'.

However the main focus for parents of children with ASD with respect to communication was *social communication* (see below).

In total, about four out of ten parents referred to difficulties with aspects of literacy: 7% referred specifically to dyslexia whereas about a third of parents (34%) referred more generally to aspects of literacy, reading, writing and/or spelling in various combinations, similar to the proportion that referred to speech difficulties. Some parents included writing with a general statement about literacy skills but five specifically referred to handwriting, with two of these parents commenting also on fine and gross motor skills and a further two parents referring to dyspraxia.

References to academic skills, in particular literacy abilities, were primarily and frequently made by parents in the LI cohorts. For example, one parent of a 6 year old commented that her 6 year old 'doesn't like writing … (and is just) starting to copy her name' and another parent stated the primary difficulties were: 'Reading and writing, (child) cannot transfer anything to paper'. Parents of older children commonly with LI noted difficulties across the literacy domains:

> ‘In literacy – writing, reading and spelling are very low’ (LI, 10 year old);
>
> ‘Cannot read or spell by himself’ (LI, 12 year old);
>
> ‘Reading and writing – putting things on paper; he can say but not write’ (LI, 12 year old).

Of the parents who specifically referred to their child as having dyslexia, this was often noted along with speech, language and communication difficulties: ‘Dyslexia – it runs in the family. She (also) has speech problems, she cannot express herself as clearly as she would like’. (LI, 12 year old). More commonly, however, dyslexia was mentioned alongside other elaborations of literacy domains in which the child had difficulties or other aspects of learning and cognition. For example, ‘He is quite behind with reading and writing – he has dyslexia’ (LI, 10 year old). However, whereas some parents reported that dyslexia had been diagnosed, others gave this as their own opinion. For example, the parent of a 10 year old (LI) commented.

> ‘The main area is, he’s dyslexic. No one has said he is – the SEN teacher says it’s correct but there is no diagnosis… his father’s brother is dyslexic’.

Reference to dyslexia was also made by parents of children in our ASD cohorts, rather than to ASD. For example, one parent noted: ‘(He’s) dyslexic (child) has difficulty writing and spelling’ (ASD, 12 year old) but went on to comment also on his difficulties in organising himself, especially with respect of time.

> ‘He cannot understand and has no feel for it. He wouldn’t know what five minutes was, never knows what day of the week it is’ (ASD, 12 year old).

None of the parents of the 11 children in our ASD-low-NV cohort referred to dyslexia, but almost all referred either, or both, to literacy difficulties and other aspects of learning, for example:

> ‘He has a lot of learning difficulties, reading and writing – he barely reads (12 year old).
>
> ‘Everything – literacy, maths… has difficulty understanding the rules of literacy … writing. She doesn’t remember: for example, she has to keep learning her times tables because she forgets’ (10 year old).

References to other aspects of learning were also common among parents of children with LI, for example: 'Concentration – he needs 1: 1' (13 year old) 'Processing information, from thinking to writing' (10 year old).

The third group of difficulties identified concerned social communication and behaviour. Almost two thirds of parents of children in our ASD cohort referred to their child having 'autism' or Asperger's syndrome (although only one referred to 'ASD') and some specifically referred to a 'diagnosis'[31]. By contrast, no parent referring to speech, language or communication needs used a diagnostic category such as 'specific language impairment'. Some parents referred specifically to social communication. For example one parent simply noted that 'Social communication is his weak spot' (ASD, 10 year old), whereas a parent of a 12 year old child with ASD referred to both social communication and ASD:

> 'Social communication difficulties – (child) has ASD. (Child) has a literal interpretation of the world.'

Other parents referred to difficulties with peer relations, for example a parent of a child described as having Asperger's syndrome said: '(It's) more social things … (child) has problems with peers, understanding what people say.' (ASD, 10 year old). Another parent referred to the: 'Social aspects of school, e.g., rules' (ASD, 6 year old) and a third to 'inferring things: personal space – (child) doesn't understand.' (ASD, 10 year old).

Interestingly, only one parent of a child in our ASD-low-NV cohort (*n* = 11) referred to these areas of difficulty. Their focus typically was on general ability, maturity and learning difficulties, commenting:

> 'Reading and writing are extremely poor – (child) is on the level of a reception child.' .

and that:

> '(Child) is autistic (and) doesn't always understand … has no danger awareness (or) stranger awareness'. (ASD-low-NV, 8 year old).

In addition, smaller numbers of parents referred to difficulties with concentration or attention (8%), memory (3%), acting out behaviour, for example linked to frustration (3%), or ADHD (4%); and one parent referred to her child's low motivation and tendency to 'give up'. In addition, in two specific instances, the parent's concern appeared to be with difficulties

[31] Note that these were comments raised by parents to general questions about the child's difficulties.

arising from the child having English as an additional language although in a third instance the parent stressed that the child's difficulties were also in the home language (Portuguese).

The lack of reference to conduct problems (just three parents) is noteworthy. These parents linked their children's difficulties to frustration. One stated: 'He screams in class (because) he gets frustrated – he's distracted easily.' The other two parents described their children's behaviour problems in terms of autistic characteristics:

> "(Child) is slightly autistic. (He) flaps his wings and can't control his emotions. (He has) behaviour problems in a group – (he) can't relate to that, can't communicate and interact." (ASD, 6 year old).

> "(Child) has lots of behavioural issues and (Child) is on the autistic spectrum." (ASD, 6 year old).

3.12.5. Academic progress

Parents were generally positive about the academic progress made by their children over the previous year and there was no significant difference between the LI and ASD cohorts.. Overall, 137 parents expressed a view, of whom 66% were positive, (39% rated it very good, 26% rated it quite good), 22% rated it 'OK', and only 12% were negative (10% not very good, 2% not good at all). Figure 3.47 shows the distribution by cohort for the combined positive and negative ratings as well as 'OK'. Overall, the parents in the ASD cohorts were more positive about their children's educational progress than those in the LI cohorts. Indeed, three quarters of the parents of children with ASD were positive although there was a difference in the strength of their views: about twice as many of the ASD-av-NV cohort rated progress very good compared with good but for the ASD-low-NV the opposite was the case.

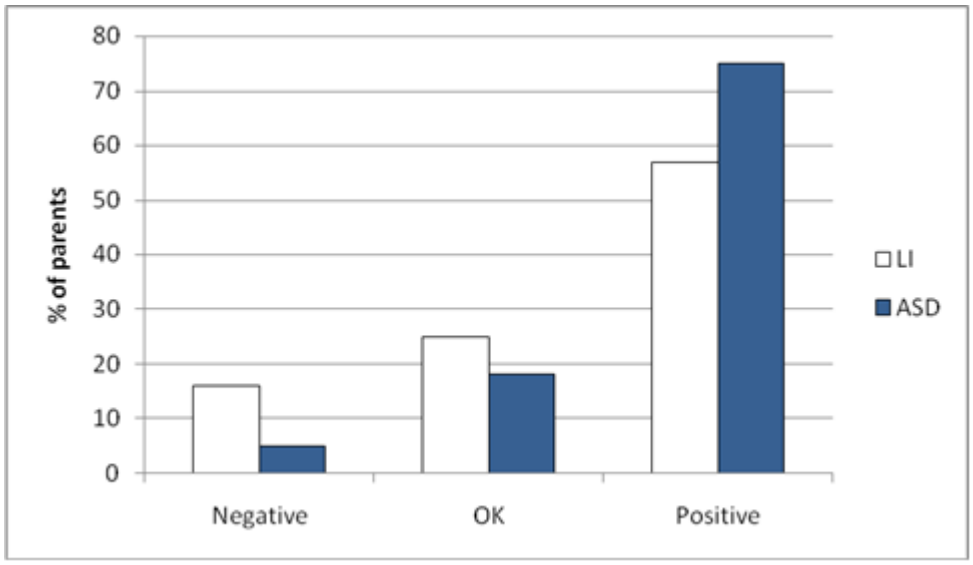

Figure 3.47. Educational progress over the last year by cohort (% within cohort)

Notes: Positive = very good or good, Negative = not very good or not good at all

Examples of parents' positive comments include: 'He is at the level he should be for a lot of lessons'; 'School is well impressed'; 'He has caught up and now is good'. However, linked to their positive judgement the parents also expressed realistic relativistic appraisals. Typical comments included 'He does make progress but it's slow'; He is making progress now, his talking does make sense'; 'School said he has improved – not fantastic'; and 'He hasn't been beaten up, he's happy'.

Parents also distinguished between curriculum subjects, for example: 'Reading has improved, has moved up three levels last year: maths – I'm not so sure'. Some parents also distinguished academic progress from behaviour, for example: 'School report is brilliant, apart from behaviour; he gets upset with (his communication difficulties) and has a temper'. Parents who were negative about progress commented, for example: '[name] is starting to struggle because reading and writing are falling behind'; 'He has not progressed academically since he left primary school'. Some of the children had made the transition from primary to secondary school and this was raised in a negative way: 'Had an extremely difficult transition'.

Central to parents' satisfaction was the nature of support provided, for example, one parent said, 'All teachers are supportive' and another commented, 'He's been lucky with his LSA for two years'.

Parents that were positive about their child's recent progress gave many examples of the changes and typically went into detail, focussing on academic progress but occasionally behaviour. Their views often presented a variable profile, for example 'He's learning, apart from reading and writing' (LI) and 'English, writing and speech have not improved (but) maths is much better'(LI). Where there was variable development, concern was typically with literacy, with reference both to slower progress and negative attitudes. However, some children were reported to have made very good progress in literacy, for example 'Before, she couldn't write; her handwriting and reading progress is unbelievable' (LI).

Parents of children in specialist resources (n = 33) were more positive than those in mainstream (p = .003). Indeed, all except one of the parents of children attending specialist resources[32] were positive or 'OK' about their child's educational progress (Figure 3.48), for example:

> 'He has come on so much. At (primary school) they had to keep restraining him, he was so bad. Now at (secondary school) he is better, more polite and grown up. He's learning, good at his lessons but let down by his reading and writing.' (ASD)

> 'He has more confidence. Targets are set for him and he enjoys school. He's starting reading proper books – I can't praise the school enough.' (LI)

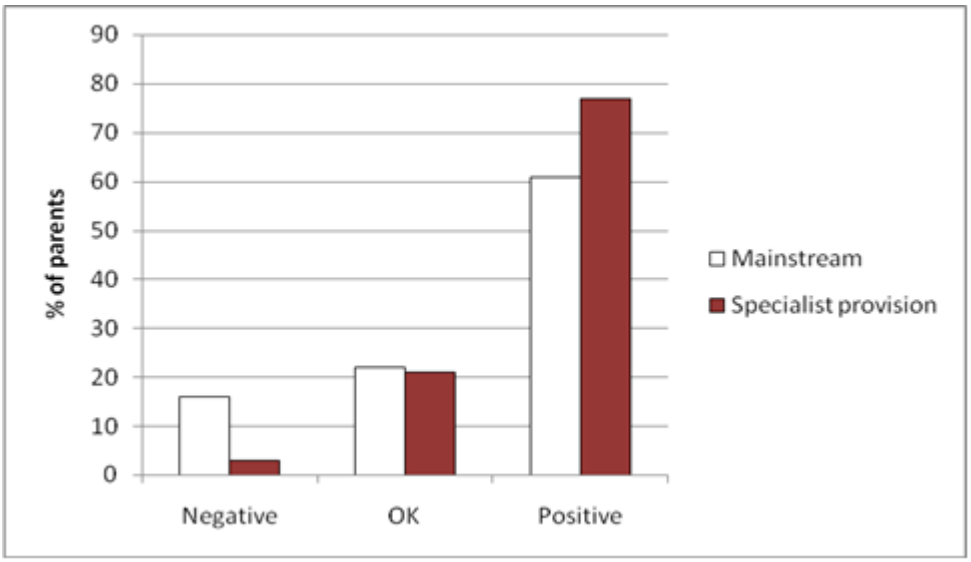

Figure 3.48. Educational progress over last year by type provision (% within type of provision)

Notes: Positive = very good or good, Negative = not very good or not good at all

[32] Typically integrated specialist resources within a mainstream school, usually either designated as an ASD or Language resource. One child was attending a special school.

There were also positive comments from parents of children in mainstream settings, including ‘School (is) well impressed, his maths is unbelievable’ (LI), and a parent who stressed the importance of his teacher and TAs:

> ‘The school is very supportive. There are no problems with the school or with the teachers. He is above his peers in maths and English – the issues are keeping him on a task. His TA knows how to handle him.’ (ASD)

Factors that had caused difficulties included transition from one school to another, for example to a large secondary school from Key Stages 2 to 3, but also from Key Stages 1 to 2. A parent of a child with ASD-av-NV commented that the child ‘had an extremely difficult transition… primary school and TA were very good’. This was not limited to children with ASD, for example the parent of a child with LI noted of her daughter that it had been a ‘huge transition (to secondary school)’.

Parents provided a positive overall view of the child’s progress over the previous year, especially parents of children with ASD, but underlying this general conclusion was a more varied picture for individual children. The more positive picture presented by parents of children in specialist resources is of interest as the additional support and ethos were valued and seen as positive. This could also be true of mainstream provision, but was less common.

Box 3.12. SEN and educational development

- The most common types of SEN reported were speech, language and communication, in that order, among parents in the LI cohort.
    - Parents of children with ASD by contrast rarely mentioned any aspect of SLCN.
- Parents commonly mentioned educational development, particularly in relation to literacy,.
    - This was particularly common among the LI cohort
- The third main concern was for behaviour. However, there was very rarely a concern about conduct problems.
    - Rather, the focus was on aspects of social communication, particularly for parents of children with ASD.
- Despite their concerns about their children's difficulties, parents were generally positive about their improvement:
    - More than 70% of parents of children with ASD were positive.
- Key to this perspective was the support provided.
- Parents were more likely to be positive if their child was receiving support from a specialist resource within the school (almost 80%)
    - Even so, about 60% of those in mainstream were considered to be making positive progress.

3.12.6. Peer relations

The majority of parents considered that their child got on well (29%) quite well (27%), or OK (32%) with other children. Hence only 13% of parents presented a negative view (10%) stating not well and 4 (3%) not at all well. However, there was a significant difference (p = .021) in parent ratings by cohort. Whereas about two thirds (68%) of the language impaired children rated their children's peer relations positively this was only the case for just over a third (37%) of the ASD cohorts (Figure 3.49).

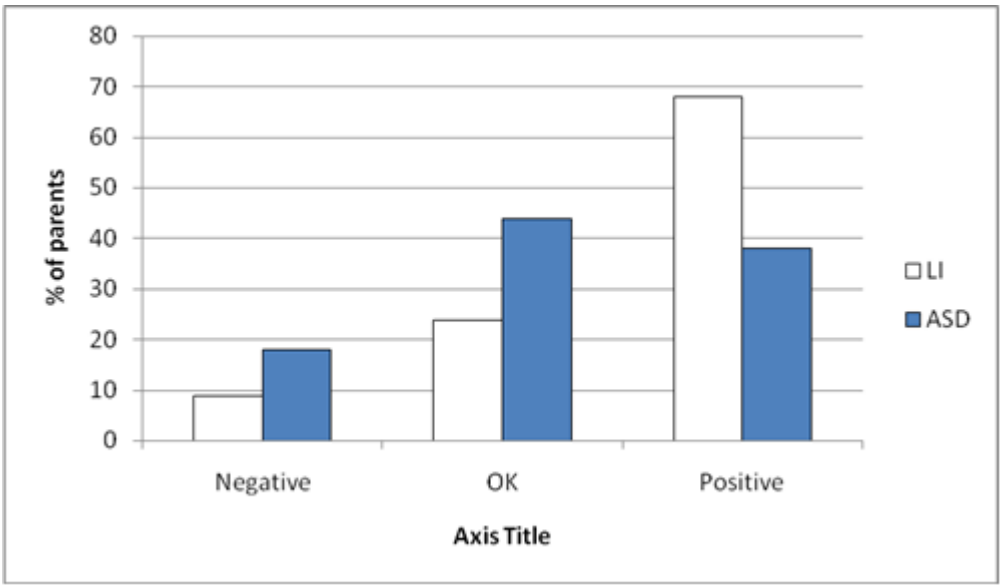

Figure 3.49. Peer relations – how well the child gets on with other children (% within cohort)

Note: Positive = very good or good, Negative = not very good or not good at all

Parents' explanations of the reasons for positive peer relations and examples of how their child was developing focussed on *friendships*, for example, comments made by parents of children with SLI giving the most positive ratings included:

'She makes friends at a drop of a hat.' (LI).

'Has got loads of friends and goes to parties.' (LI)

In the case of children with LI-low-NV, parents giving the most positive ratings commented that:

'He has friends, everyone likes him.' (LI-),

'She helps other kids, she socialises – is a really kind person.' (LI).

Parents of children with ASD who were very positive gave rather different explanations. Even though they were rating their child at the most positive point on the scale, five of the seven parents provided less positive elaborations, for example:

'No troubles as he doesn't interact.' (ASD)

'OK in his year (but) does not socialise out of that.' (ASD).

'All right. Not many friends (and) girls rather than boys.' (ASD).

'Some children pick on him – he is quite liked except for a few active ones.' (ASD)

Only one of the 11 parents with a child with ASD-low-NV reported that her child got on very well with other children stating ‘Everyone knows him – they give him a hug.’ The one parent to rate her child as getting on quite well said that; ‘He has a small group of friends at (mainstream) school: they are of similar temperament.

Parents’ comments were not related to age group. Rather, their descriptions referred to friendship characteristics appropriate across this age range of our sample, including ‘plays with friends’, ‘socialises’, ‘’they are always knocking the door’, and ‘has a close circle of friends’. Where parents rated peer relations negatively, a number of different manifestations were reported. These included immaturity, shyness and hesitancy to engage.

‘Not like an 8 year old – is like a 6 year old.’ (ASD)

‘He sticks with the girls. (I think) he feels inferior.’ (LI)

‘Some children take advantage of him – he’s easily led.’ (LI)

Reports of overt victimisation (12% of all parents) were about twice more common among parents of children with ASD than parents of children with LI. Victimisation was typically described in a general way, being ‘picked on’, or as relational bullying, being left out and isolated. Only one parent noted overt physical bullying, ‘she gets pushed a lot’ (SLI) although the parent of a 12 year old girl (LI) reported that her son had been threatened by other children, one of whom had given him cigarettes and possibly drugs. Another reported of her 12 year old (ASD) that, ‘Some demand money’. Two parents also mentioned teasing (verbal bullying), one an 8 year old with ASD-av-NV, and the other a 10 year old with LI-av-NV.

Only three parents reported aggressive behaviour. One parent of a 12 year old boy with ASD considered that her child’s problems with peer relations were, ‘Partly him: he finds misbehaving attractive – he gets into squabbles’. A parent of a 10 year old (LI-low-NV) commented that her 10 year old son had his own friends to play with but, ‘Others he doesn’t like one bit – he has a go at them’. Finally, a parent of an 8 year old (LI) reported that he played with many children but, ‘he gets aggressive if he sees a threat from another child’.

The other two factors identified by parents for peer relationship problems concerned limited social skills. There could be problems linked to maturity, for example, ‘Social skills are not what they should be… he behaves younger than his age, (LI, 10 year old). Other parents noted a lack of interest, ‘He doesn’t mix and is not interested in other children’ (ASD, 12 year old), or a lack of social skills: ‘He’s not good at small talk’ (ASD 12 year old).

The second factor concerned aspects of social cognition and appropriate social skills; that is, knowing how to interpret others' feelings, intentions and behaviour, and also having the appropriate skills to negotiate or behave in a way seen as acceptable (or 'normal') by other children. One parent of a 10 year old with LI-av-NV commented that 'Kids notice he's a bit different – he's vulnerable'. Some parents linked these problems to verbal communication: 'Speech and language problems are still there – he can seem "foreign"' (LI, 12 year old); being 'very tactless' (ASD, 12 year old) or 'Not knowing how to talk about a topic' (ASD, 6 year old). Furthermore, one mother, who did not specify that her 10 year old child with ASD had been bullied nevertheless commented, 'What does he understand about bullying – does he interpret?' before going on to describe his taking out frustrations by kicking and damaging property.

Box 3.13. Peer relations

- Two thirds of children with LI were considered to have positive peer relationships compared with just a third of those with ASD
    - Only about 10% of children with LI and 20% of those with ASD were considered to have poor peer relationships.
- A sizeable majority of parents referred to very positive relationships,
    - Of other children loving their child, or of their child having many friends.
    - Overt victimisation was relatively rare, about one in 10, but twice as common among children with ASD.

3.12.7. Relationships with teachers

According to their parents, the children generally had positive relationships with their teachers and this was common across the cohorts, with about 80% of the children in both cohorts being described as getting on with their teachers very well or quite well and only about 3% overall commenting negatively (Figure 3.50). Note also that almost two thirds of parents reported their child got on 'very well'.

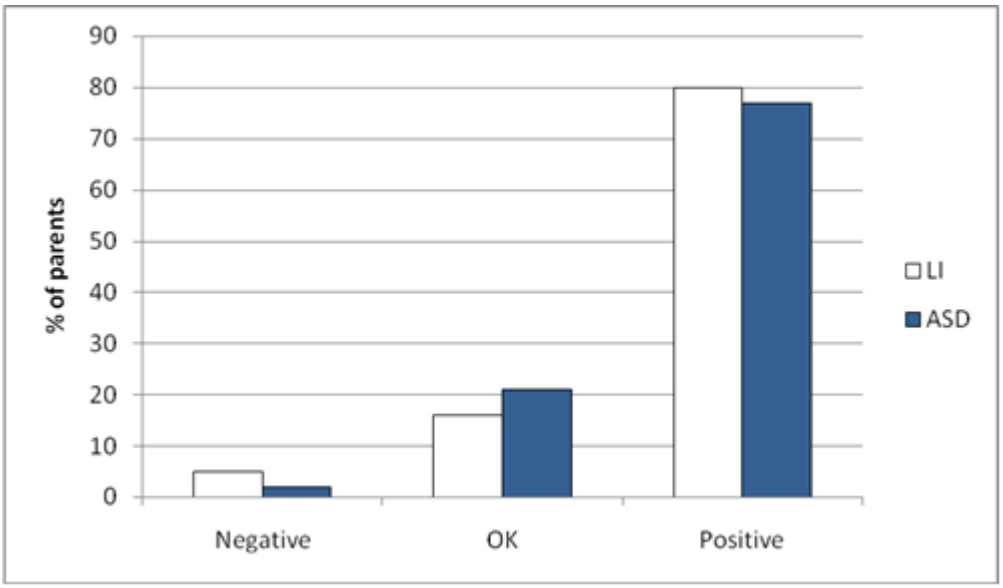

Figure 3.50. How well the child gets on with teachers (% within cohort)

Notes: Positive = very good or good, Negative = not very good or not good at all

The main message that comes out strongly from the parents' accounts is that the children like their teachers and the teachers like them. Children were also described as loving and adoring their teachers. Some teachers and TAs were described as having similarly strong feelings: 'Teachers love her' (LI, 6 year old); 'The LSA has a massive bond with (child)' (ASD, 6 year old); 'At parents evening they said he was a delightful boy' (ASD-av-NV, 12 year old); 'Teachers say – what a lovely boy – he tries so hard' (LI, 8 year old).

Other reasons for these very positive relationships included a general liking for adults and more specific references to factors including feeling safe, obeying teachers; the teacher making the children laugh, having good rapport, being strict and 'having the measure' of the child. In addition, sensitivity to their child and, in one case, a specific reference to the fact that, 'The teacher does not shout – (child) doesn't like raised voices' (ASD, 10 year old) were seen as important.

As shown in Figure 3.50 relatively few parents considered that their child did not get on well with their teacher(s). Shouting was a concern for three of these parents; otherwise the main concern was that the teacher did not understand the child's ASD-related needs: 'Last year's teacher didn't know how to deal with (child's) Asperger's' (ASD).

Box 3.14. Relationships with teachers

- Positive relationships with teachers were reported by about 80% of parents in both cohorts, with 60% being very positive. Their main message was that their child liked their teacher and – importantly – their teacher liked their child.
- This indication of a reciprocally positive relationship is indicative of a significant factor in these children's educational development despite their difficulties.
- Positive views were particularly common from parents of children in specialist resources –
    - about two thirds were positive

3.12.8 Meeting learning needs

About six out of every ten parents across the cohorts considered that the school was meeting their child's needs, with no significant difference between the cohorts (Figure 3.51) Only a minority (4-5%) of each cohort gave a negative rating but note that 11% of parents of children with LI were unable to give a rating (don't know).

The reasons for this level of positive ratings were many and varied. Some parents made general comments such as, 'They are fantastic in everything' (LI). Others commented on teachers' general level of support and that they considered their child was making progress.

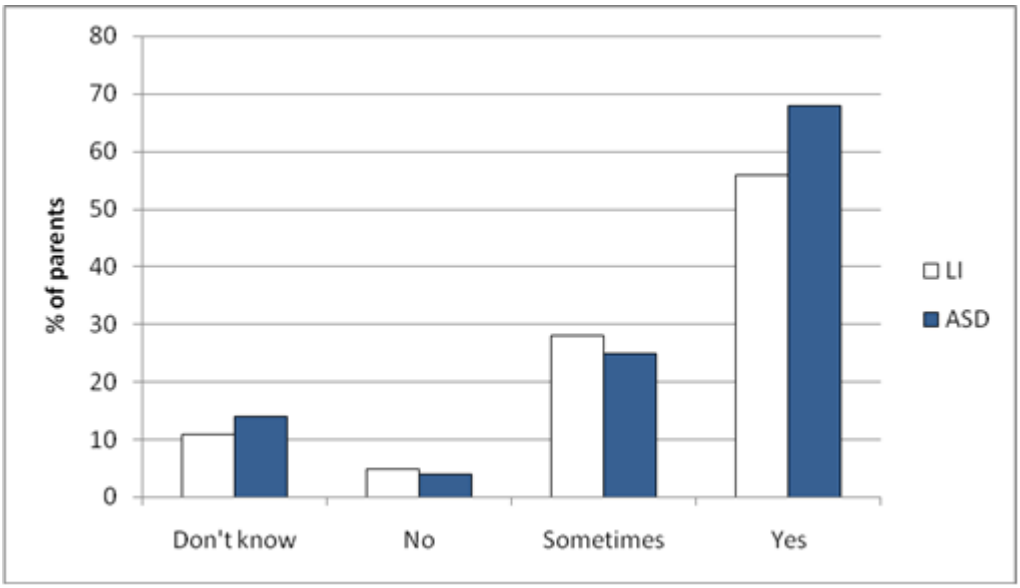

Figure 3.51. Extent to which the school is meeting the child's SEN (% within cohort)

Parents whose children were attending specialist provision in mainstream schools were almost all very positive (Figure 3.52)[33]. Many referred to their child's progress, for example, 'Because there's been much progress in a short time – exceeded targets' (LI). References were also made to organisational and support factors, one parent noting the important changes consequent upon a new head teacher's appointment. The support of a teacher from the specialist resource in mainstream lessons, as well as that from LSAs and SLTs, were also positively noted. One more ambivalent voice commented on the specialist provision catering for 'higher up ASD children' whereas she considered her child 'Needs autism help for moderate ASD – everything is too complicated'.

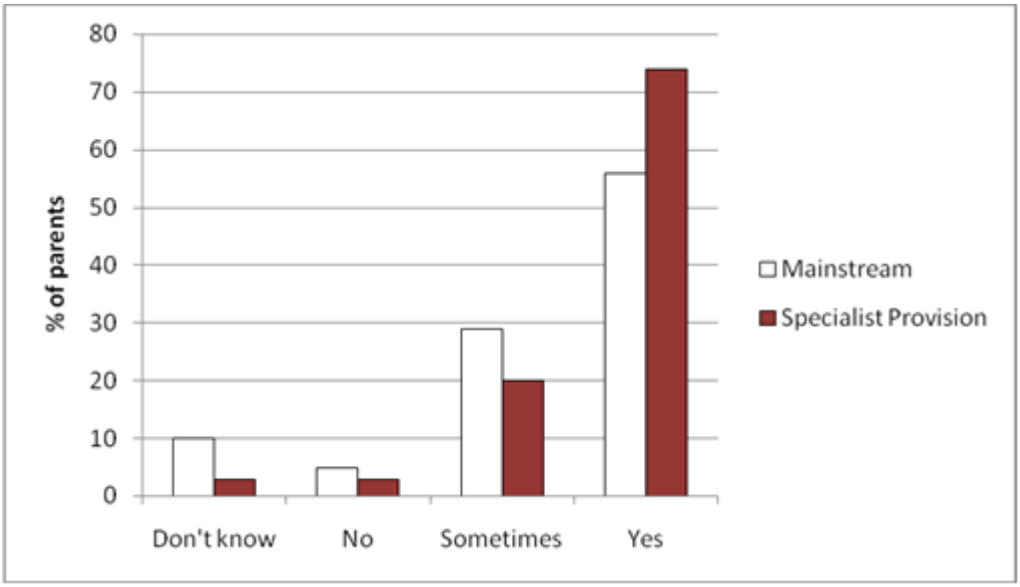

Figure 3.52. Extent to which the school is meeting the SEN by type provision (% within type of provision)

More positive comments ('yes' rather than 'sometimes') were mainly produced by parents with children in specialist provision – but note that negative comments were the very small minority and there was no significant difference between the types of provision. These often concerned perceived lack of resources or of appropriate staff training. Note also that the parents who did not know how well the school was meeting their child's needs (Figure 3.52) mainly had children in mainstream settings.

Box 3.15. Learning needs

- About 60% of parents were pleased with how the school was meeting their child's learning needs
- Parents of children with ASD were more positive than parents of children with LI
- Parents of children in mainstream schools with specialist provision were more positive than parents of children in mainstream

3.12.9. Meeting social and emotional needs

A similarly positive perspective of the children's social and emotional needs, with no significant difference between cohorts was also evident (Figure 3.53), although a higher proportion of parents in the ASD cohorts were less positive (rating 'sometimes') – but still very few gave a negative response (range 0 – 9%). However, note again the relatively high percentages of parents saying 'don't know', especially parents of children with LI.

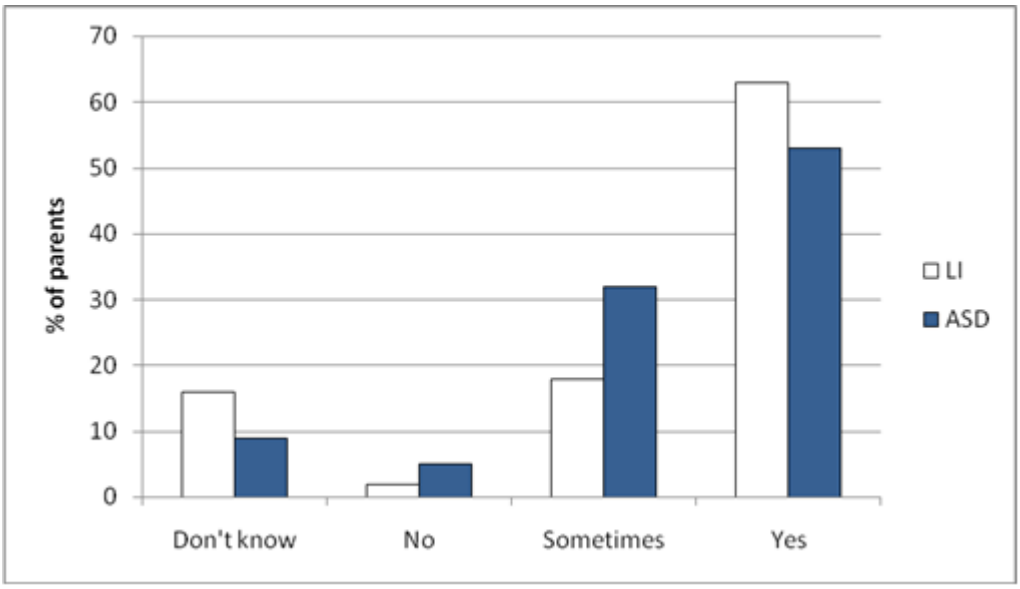

Figure 3.53. Extent to which the school is meeting the social and emotional needs (% within cohort)

Again, the parents of children in the specialist resources were generally positive, referring to general organisational and support approaches rather than specific interventions. For example, one parent commented that:

> 'The new head teacher won't let a kid be on their own in the playground. She gives a good example of how to behave to each other. In all weather she's out in the playground – the head teacher is good at social aspects.' (LI, 8 year old).

Relatively few parents gave negative ratings – indeed no parent whose child was in specialist provision did so. However, there was no significant difference between the types of provision.

Table 3.12. Extent to which the school is meeting the social and emotional needs by type of provision (% within type)

	Mainstream (*n* = 104)	Specialist provision (*n* = 35)
Yes	54	74
Sometimes	27	14
No	6	0
Don't know	13	11

There was little evidence of special programmes being in operation. Rather, parents commented on features that indicated that staff had greater awareness, skills and knowledge, but also – and importantly – more flexibility and time to address problems that arose. For example, 'social groups' were mentioned with reference to both mainstream and specialist provision, but parents of children in specialist resources also mentioned that a child could remain in the resource at break and take friends with them; spend time being calmed down if upset. Many parents of mainstream children referred to sensitivity, encouragement, a sense of the school's caring ethos, and general support. One parent of a child in the ASD cohort commented 'They are trying – they're good, the SENCO is good, ASD is on the up'. A parent of a child with LI noted:

> 'They really try to encourage (child). (They run) after school clubs – (they're) unsung heroes, putting their own time in.'.

On the other hand, a minority of parents of children in mainstream settings were concerned that the school was not meeting their child's social and emotional needs appropriately, as shown by these two parents: 'They try hard but it is not enough' (ASD); 'They don't have the time, especially the teachers' (ASD).

Box 3.16. Social and emotional needs

- About half of parents considered that their child's social and emotional needs were being met
    - Very few parents were negative (less than 5%).
    - Three quarters of parents of children in specialist provision were positive
- Those in a specialist resource were considered to have their social and emotional needs met more effectively,
    - Parents referring to the flexibility offered as well as the teacher and other support available.

3.12.10. Additional support

The majority of parents reported that their child had received additional support over the previous year, in particular those in the ASD cohorts: LI 66%, ASD 82%. However, one theme arising from the comments of parents of mainstream children was a lack of awareness of exactly what was being provided and by whom, particularly parents of children with LI, of whom 19% did not know whether their child had received additional support.

One parent was unsure whether the person supporting her child was a teacher, TA or SENCO. Other comments included:

> 'Every year a lady rings to say they help her – could be the SLT.' (LI)

TAs or LSAs were frequently mentioned and appear to provide the most support, followed by SLTs. Children in specialist resources received much more and more frequent support and, in general, parents of these children were more able to describe this.

Many parents would have liked more support for their children but this was expressed in different ways: as quantity, 'I would love more'; frequency, '(child) needs day to day support', and intensity, 'A small group is more helpful'. Many parents confirmed their satisfaction with the quantity and quality of support but a minority considered the support was insufficient at that time or had concerns whether it would continue to be available in the future. Some parents were critical of the difference between the support provided and that expected, for example based on the child's statement of SEN. One mother commented that she *would* be happy if her son were receiving the full 25 hours; she thought the school was using his time for other children.

The percentage of parents reporting additional support was similar across provision (74% mainstream, 69% specialist provision). It is possible that this question was confusing for parents of children in specialist provision as, by definition, they were – or should have been – receiving additional support. However, parents of children in specialist provision were much more satisfied, for example:

> 'Because he's getting what he needs and is able to thrive socially and emotionally and have access to mainstream' (ASD).

Table 3.13. Additional support by type provision (% within type)

	Mainstream (*n* = 104)	Specialist provision (*n* = 35)
Yes	74	69
No	14	11
Don't know	12	20

3.15.7.1 Support from speech and language therapists and educational psychologists

Figure 3.54 indicates substantial variation in receipt of speech and language therapy with respect to cohorts, from 36% of the LI-av-NV cohort to 73% of the ASD-low-NV cohorts. Indeed, the children with ASD were significantly more likely to receive SLT support than those with a language impairment (p = .031). Parents frequently did not know how much SLT support their child was receiving. This is likely to be a drawback of its being delivered in school rather than at an off-site clinic to which the parent takes the child.

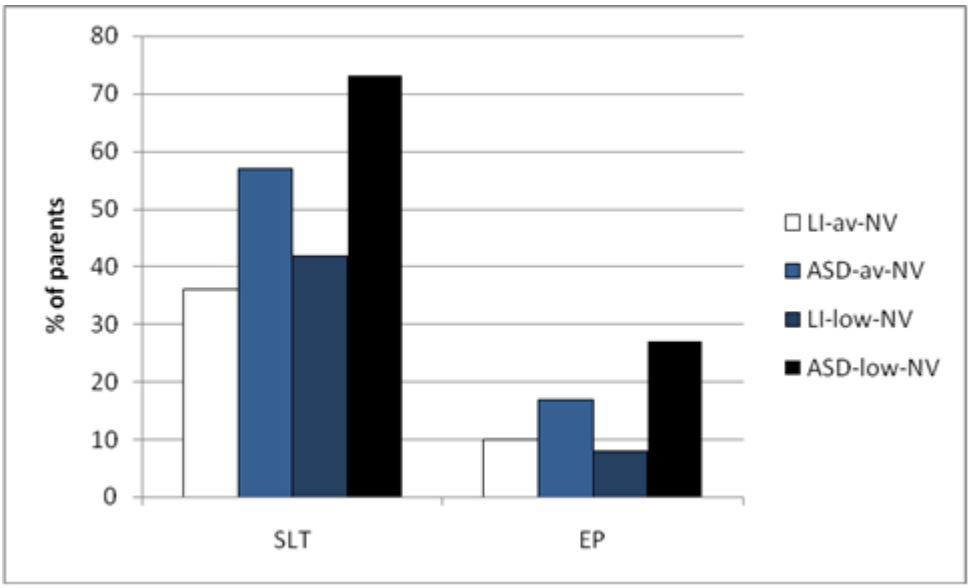

Figure 3.54. Help from other special needs services/professionals (% within cohort)

Note. SLT = speech and language therapist, EP = educational psychologist

According to their parents children with ASD were significantly more likely to receive EP support (p = .004). Only minorities of children received support from EPs other than the ASD-low-NV cohort (Figure 3.54). However, the parents' comments indicated that the reality was of even less involvement with EPs as most of those parents who answered 'yes' to EP involvement, clarified that this was for an assessment or an annual review.

Children were significantly (p = .003) more likely to be receiving support from special needs services if they were attending specialist provision (73% v 40%).

Box 3.17. Additional support

- Additional support was made available to about 70% of children in mainstream and specialist provision.
- This was overwhelmingly SLT support.
- The pattern across all four cohorts was perhaps counter-intuitive:
    - about 40% of children with LI were receiving SLT support compared with about two thirds of those with ASD
- Support from EPs was rare – only 10% of children with LI – but about a quarter of our (small) group of children in the LI-low-NV cohort.

3.12.11. Statements of special educational needs

Twice as many children with ASD had a statement of SEN, according to their parents, than those with language impairment[34]: 58% v 29%. Indeed, all but one of the 11 children in the ASD-low-NV had a statement and that child was awaiting a decision. Overall those parents whose child had a statement could all state whether support was specified and, if so, its nature and whether the provision had been changed. However, a minority were unclear and one parent said she could not understand the statement.

Forty per cent of children in mainstream had a statement as did 69% of children in specialist resources. The fact that 29% of children in specialist resources did not have a statement reflects policies in particular LAs.

The most common forms of support specified, according to the parents, were hours of LSA support or specialist resource: in the latter case hours were specified if a part time placement within the resource was determined. However, only one in five of the parents were able to specify the frequency of support, three quarters of those parents whose child had a statement. Not one parent of a child at School Action Plus was able to specify the provision being made for their child.

A total of 59 parents (42% of all parents) expressed a view on how they felt about the level of support. Of these, three quarters (73%) were positive, comments ranging from 'happy', 'yes it's fine', 'it works well for him and I'm happy' to 'really good', 'excellent' and 'really pleased'. Of the minority of 22% that were not satisfied (another three parents (5%) were ambivalent), concerns included level of provision, for example, 'I would have liked more, for example, time from a dyslexia teacher' (LI) and lack of support for a child in the ASD cohort at playtime and on the school journey. But parents also had other concerns, for example the lack of a statement – one parent of a child with ASD said she had tried three times to get a statement, and another said she had not signed the statement as the number of hours of support was not specified.

3.12.12. Suitability of support

Only a minority of parents considered that the SEN service received by their child was highly tailored to meet their needs (Table 3.14) although overall the percentage making positive

[34] Involvement in the research required that the child was either the subject of a statement of SEN or was at School Action Plus where support is provided by a professional from outside the school, e.g. a speech and language therapist.

statements ranged from 41% (LI-av-NV) to 63% (the two ASD cohorts). Whereas a higher proportion of parents of children in the two ASD cohorts gave negative responses and half of the parents of children in the ASD-low-NV cohort considered that services were not at all tailored to meet their children, there was no significant difference between the cohorts. For example, one parent commented that 'The TA[35] helper that he has is not specific for ASD'. However, she also commented that, 'They seemed to click straight away' and was disappointed that the TA would change at the end of term, as she was an agency worker.

Table 3.14. Specificity of special educational services received (% within cohort)

	LI-av-NV (*n* = 58)	ASD-av-NV (*n* = 46)	LI-low-NV (*n* = 24)	ASD-low-NV (*n* = 11)
Highly tailored	12	11	17	27
Quite tailored	29	52	38	36
Not very tailored	7	22	8	9
Not at all tailored	3	7	4	0
Don't know	34	9	33	27
No responses	10	0	0	0
Not appropriate	3	0	0	0

More parents (69%) of children in specialist provision were positive about the specificity of the special educational services received (see Table 3.15) but this did not reach statistical significance (p = .076). One parent of a child with LI in a language resource stated that she was satisfied, 'Because everyone who is involved knows what is suitable for that child'). A parent of a child in an ASD resource commented:

> 'The woman who runs the unit is incredibly experienced. The TAs are well trained. The teachers and TAs listen to the children and learn from this.'

[35] We have generally referred to learning support assistants (LSAs) but some parents used the generic term teaching assistant (TA).

Table 3.15. Specificity of special educational services received (% within type of provision)

	Mainstream (*n* = 104)	Specialist provision (*n* = 35)
Highly tailored	9	29
Quite tailored	38	40
Not very tailored	13	9
Not at all tailored	5	3
Don't know	30	11
No response or not appropriate	5	9

Overall, parents gave similar ratings of teachers' understanding of their child's strengths and needs both by cohorts and whether the child was in mainstream or specialist provision. In each case, about two thirds were positive and about one in five was negative and a substantial minority were unable to comment (see Table 3.13 for results by provision). However, examination of the parents' comments revealed the tensions and conflicting factors affecting whether teachers understood a child's strengths and needs. Some concerned the nature of individual children:

> 'The present teacher – definitely. But ASD relates to an individual. If a child cannot relate, they should be able to change.' (ASD resource).

> All teachers need to get to know the child. For example, if he doesn't understand they must use the same words again – if they change the words he has to reprocess the language. In Year 2 the teacher found she got better doing this – it demonstrates the need for continuity of teachers.' (language resource).

> 'Some understand him but not all – not the main teachers who do the big classes. Small groups and TAs do.' (ASD resource).

Table 3.16. Teachers' understanding of the child's strengths and needs (% within type of provision)

	Mainstream (*n* = 104)	Specialist provision (*n* = 35)
Yes	59	69
No	22	20
Don't know	18	9
No response	1	3

The demands of mainstream schools were also highlighted by these parents of children with LI in mainstream::

> '… because of changing classes. By the time they understand (child) has to move on.' .

> 'The SENCO and teacher and head teacher are OK (but) many staff do not understand ADHD or SLCN.'

One parent of a child with LI highlighted a potential difficulty with over-reliance on a TA:

> 'The class teacher is OK, now – not sure about six months ago. It has taken all year for the teacher to get to know (child). The qualified teacher doesn't know the child until the third term because he spends most of his time with the TA.'

3.12.13. Parent involvement

3.12.13.1. Decision making about a statement

Of those parents who had been involved in the statutory assessment system, the large majority (8 out of 10) were either satisfied or very satisfied. However, there was a marked difference in levels of satisfaction between cohorts, with parents of children in the two ASD cohorts more likely to be satisfied. For example, whereas two thirds of parents in the LI cohort were satisfied, this was the case for nine out of every 10 parents in the ASD cohort.

Reasons for satisfaction centred on good communication and a sense of having control. For example, one mother of a child with ASD stated that her opinion was always sought about the statement and another said she was 'the driving force of his statement'. Among the minority that were dissatisfied, difficulties in gaining a statement were reported. One 'had to

fight tooth and nail' (LI); another had 'threatened a tribunal' (ASD). However, this level of conflict was rare.

3.12.13.2. Decision making about support

Levels of satisfaction with involvement in decision making about support was also generally positive (69% LI, 77% ASD – for combined very satisfied and satisfied – see Figure 3.55) and there was no significant difference between the cohorts. Again, positive comments were linked to effective communication and a sense of having some control.

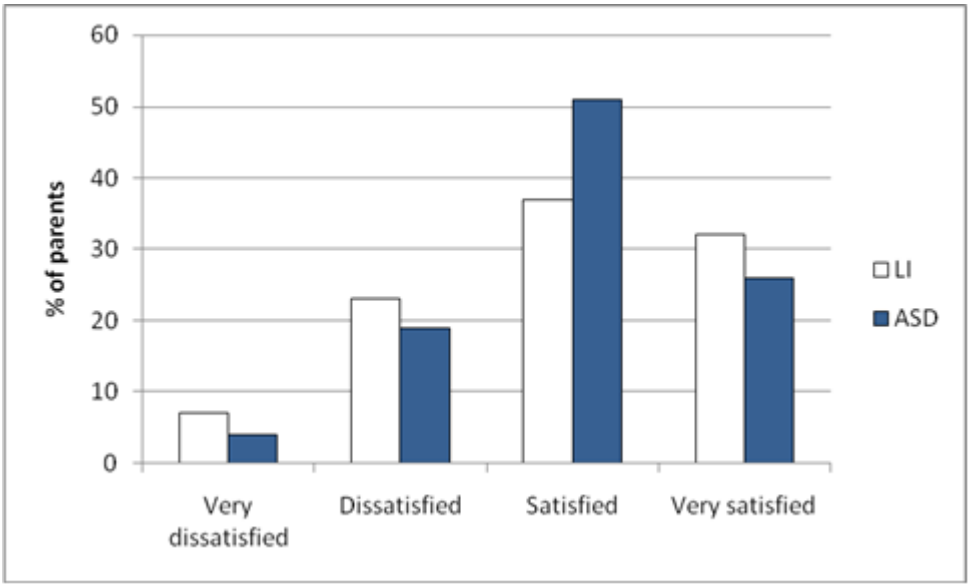

Figure 3.55. Satisfaction with family's involvement in decision making about support (% within cohort)

Apart from formal reviews and parents evenings, many parents reported they had frequent contact, including going to school regularly. One mother said she spoke to the class teacher once a month. Another reported she was 'always involved' but through a more ad hoc system, going in 'quite often' (ASD). However, a minority of parents reported dissatisfaction with decision making regarding support:

> 'Whatever they mention, it never happens.' (LI)
>
> 'Unless you gee up and badger them you don't hear.' (LI).

Parents were divided with respect to whether they wanted to be more involved or felt they were involved about the right amount in their child's choices and progress. Some wanted more regular engagements: 'It would be nice to have monthly meetings' (LI), but other parents pointed out that the demands of other children or working limited the practicality of more involvement. Home/school books were helpful, as was information communication, for

example when picking up the child after school. However, some parents would have liked more help to aid communication:

> ‘It would help at home if they would write the homework and simplify (it).’ (ASD).

3.12.14. Desired outcomes

The parents in our samples had a wide range of preferred outcomes for their children over the following year. *Academic outcomes* were very commonly mentioned, with parents highlighting particular aspects or making more general comments:

> ‘For him to read and write a sentence.’ (LI, 8 year old).
>
> ‘I would like his confidence in reading to improve.’ (LI, 10 year old).
>
> ‘I would like higher grades – for him, to be able to achieve without adult supervision.’
>
> ‘To continue to make fantastic progress and have his needs met.’ (LI, 8 year old).
>
> ‘The main thing is his handwriting.’ (LI, 10 year old).

Speech, language and communication were also mentioned but less than educational progress.

> ‘For his speech to improve.’ (ASD, 8 year old).
>
> ‘Work on sounds to speak properly.’ (LI, 10 year old).
>
> ‘I would like (child) to get perfect speech.’ (LI, 6 year old).
>
> ‘Communication would be more flowing’. (LI, 6 year old).

There was also a strong theme concerning *social development*. This was particularly prevalent among parents in the ASD cohort although only one parent of a child in the ASD-low-NV cohort of 11 children raised this. Friendships were often mentioned:

> ‘To make friends and enjoy company.’ (ASD, 6 year old).
>
> ‘To develop more friendships and be invited to other people’s houses.’ (ASD, 12 year old).

Social confidence was also important:

> ‘To be more confident about himself – (I) have to follow him everywhere. If he can go to school on his own.’ (LI, 10 year old)

as was *independence*:

> ‘I would like him to be more independent – develop his social skills more.’ (ASD, 12 year old).

Parents also referred to their hopes for their child being '*normal':*

'He would like to be like normal like his friends.' (ASD, 12 year old).

'To be normal like any other girl.' (ASD, 12 year old).

'I want him to be back to normal – like his younger brother.' (LI, 6 year old).

Being *happy* was also important to parents:

'To be settled and happy and able to get on.' (LI, 12 year old).

'To be happy at school – I don't think he should be in mainstream.' (ASD, 6 year old).

Parents referred to *general progress*:

'I would like (child) to make more progress and to have more help.' (LI, 8 year old)

'I'd like him to make progress, to see him going up a level.' (ASD-av-NV, 12 year old)

and to see their child *catching* up:

'Hopefully to catch up with his peers (and) carry on enjoying what he's doing.' (LI, 6 year old).

In summary, these parents presented vary varied perspectives regarding their preferred outcomes. These included academic, communication and social outcomes. There were some tendencies for differences between our groups with parents of children in the ASD cohort being more likely to mention social outcomes, particularly including friendships. However, there was also much overlap of preferred outcomes between the cohorts.

3.12.15. General satisfaction with the school

As shown in Figure 3.56, the majority of parents were satisfied with their child's school (67% LI, 76% ASD were either satisfied or very satisfied) with no significant differences between cohorts.

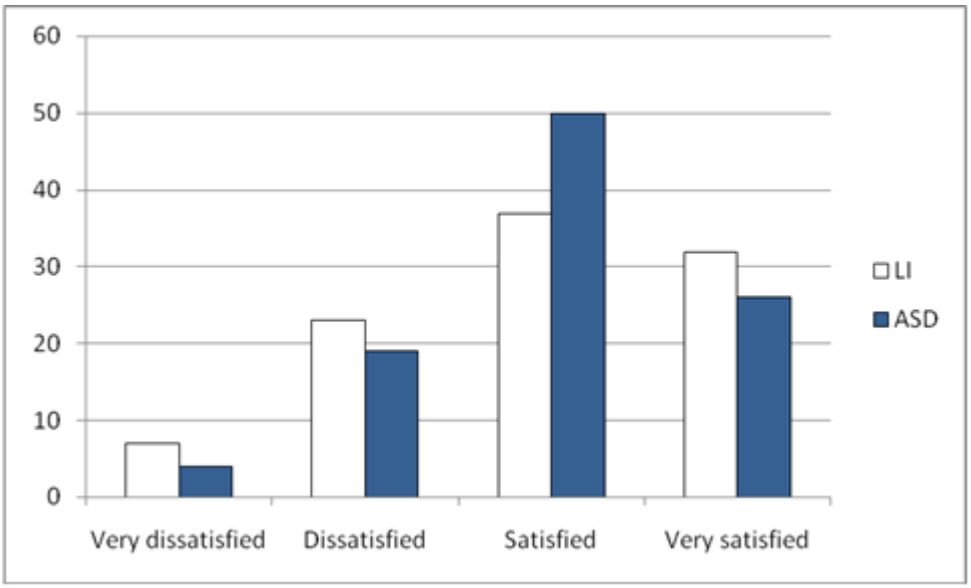

Figure 3.56. Satisfaction with school (% within cohort)

There was no significant difference between the groups of parents with respect to satisfaction with type of provision: about 90% in each case. Explanations for their satisfaction ranged from reference to their child's progress and happiness to the quality of the provision being made. For example, one parent said simply, 'Because there are no more problems' (LI); another said, 'Because they've changed (child) – he now sees himself as more normal ' (ASD). Parents also referred to their child no longer being distressed, having settled in, receiving support, and being happy and comfortable.

Other positive comments about schools included general statements such as 'The school meets his needs and welfare' (LI); 'They are taking care of him and his needs' (ASD-low-NV); and 'It's a really good school' (ASD). More specific references included, '(It) seems a caring environment, he's happy to go and staff are approachable' (ASD). Another parent said:

> 'The school is brilliant – the amount of help he's got! Four individual teachers including two assistant teachers.' (LI-low-NV)

Parents who were dissatisfied were in the minority. One parent felt that 'Everything is very slow – not enough is being done' (LI). Another stated that, 'Until recently it was not that good – now (I've) discussed and more is in place' (ASD). Another parent compared the secondary school unfavourably with the previous primary school:

‘Because the primary school was exceptional – the secondary is not the same. It was a shock going to secondary school – if there was more help to be had it would be better.’ (ASD).

Overall, parents were satisfied with their child’s school and the concerns of the minority were relatively limited.

Box 3.18. Satisfaction and desired outcomes

- The large majority of parents (about 80%) were satisfied with their involvement in the statutory assessment system.
- Positive experiences were engendered by
    - Good communication
    - Feeling in control
- About 70% of parents were satisfied with their involvement in decision-making about their child’s provision in school.
- Parents’ main *desired outcomes* for their child were
    - Academic achievement, especially literacy
    - Speech, language and communication
    - Social development, especially friendships
    - Social confidence
    - Independence
    - ‘being normal’
    - General happiness
- The majority (about 70%) of parents were satisfied with their child’s school
- Parents valued the school’s
    - Quality of provision
    - Taking care and meeting their child’s needs
    - Ability to make their child happy

3.12.16. Conclusion: Parents’ perspectives

Our interviews with parents provided complementary data to the evidence presented earlier in the report. The same pattern of a large degree of overlap as well as differences comes through from these parents of children with LI and ASD. Interestingly, on most issues on which the parents were asked to provide quantitative data there were no significant differences between the cohorts (when examined as either the four cohorts or the LI and

ASD combined cohorts). It is also of note that, despite the difficulties experienced by their children, these parents in general were positive – but not uncritical - of the provision made for their children. Nevertheless, there are also indications of important limitations in the support provided and, by contrast, the more positive views regarding support in mainstream schools with specialist resources compared with individual inclusion into a mainstream school.

3.13. Integrating findings across domains: Predicting reading, attainment, behaviour and classroom context

Consistent with previous research (e.g., Williams et al., 2008; Bishop, 2003) we found that for individuals with LI and with ASD the challenges they experience are not limited to the key characteristics that define them. Pupils with LI exhibited difficulties beyond the language domain and pupils with ASD showed difficulties beyond social communication and rigid and repetitive behaviours. The combination of types of data that we have collected on this cohort of pupils spans their learning/attainments, language and cognitive abilities, teacher, parent and self-report on their behaviour and experiences, school staff reports, and observations of the pupils in the classroom. This affords us a unique perspective to investigate how these things 'fit together' and whether this is similar or different in pupils with LI and those with ASD.

In this section we aim to highlight key findings from the results and extend them by investigating associations across the broad domains of functioning that we have assessed. In the sections that follow, we describe a series of hierarchical regressions predicting reading, attainment according to national curriculum tests, behaviour and elements of the classroom context.

3.13.1. Which factors explain individual differences in reading?

As described above, we used a range of measures to assess reading. The SWRT and YARC measures of word recognition and reading comprehension were repeated at Time 1 and Time 2 therefore we focus on these measures when considering individual differences in reading further.

3.13.1.1. Word recognition

Two hierarchical regression analyses were conducted to investigate which factors explain unique variance in word recognition at Time 1 and Time 2 (see Figure 3.57). At Time 1

analyses were possible across 119 pupils and at Time 2 across 120 pupils (70% of the sample).

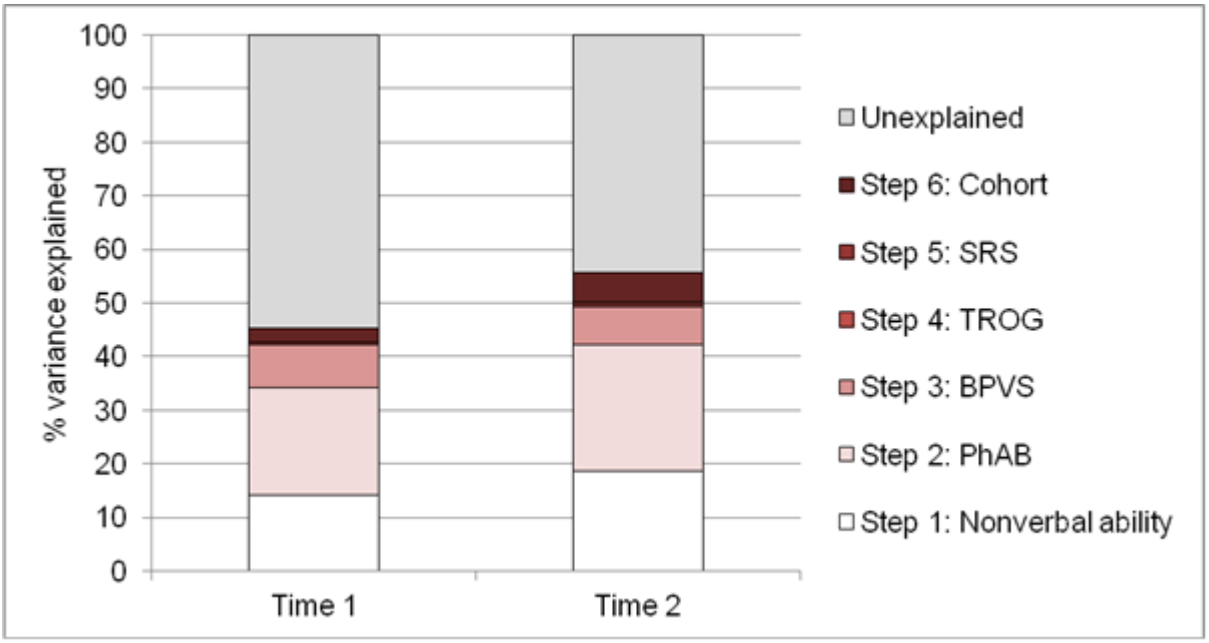

Figure 3.57. Regression analyses predicting word recognition at Time 1 and Time 2

Equivalent regression analyses were conducted to predict word recognition at Times 1 and 2 with nonverbal ability entered as a control variable at the first step followed by measures of phonological processing (PhAB; step 2), receptive vocabulary at Time 1 (BPVS; step 3), receptive grammar at Time 1 (TROG; step 4), autism symptomatology at Time 1 (teacher SRS at screening; step 5) and cohort (LI vs. ASD; step 6). *Z* scores were used in all analyses as this allowed us to account for age while minimising the number of predictor variables.

Figure 3.57 presents the percentage of variance explained at each of these steps. The figure also indicates the amount of variance left unexplained by the model (total variance explained Time 1 = 45.2%, Time 2 = 55.6%). In both models, significant variance was explained at steps 1, 2, 3 and 6 but standardised β weights for models with all variables included indicated that only phonology, receptive vocabulary and cohort were significant unique predictors of word recognition skills.

A third regression analysis was conducted to predict word recognition at Time 2, that was identical to the previous Time 2 word recognition analysis except that Time 1 word recognition was entered at the second step to control for autoregressor effects (the effect of earlier performance in this domain). For this analysis data were again available for 119

pupils (70% of the sample). Figure 3.58 presents the percentage of variance explained at each step of this hierarchical regression.

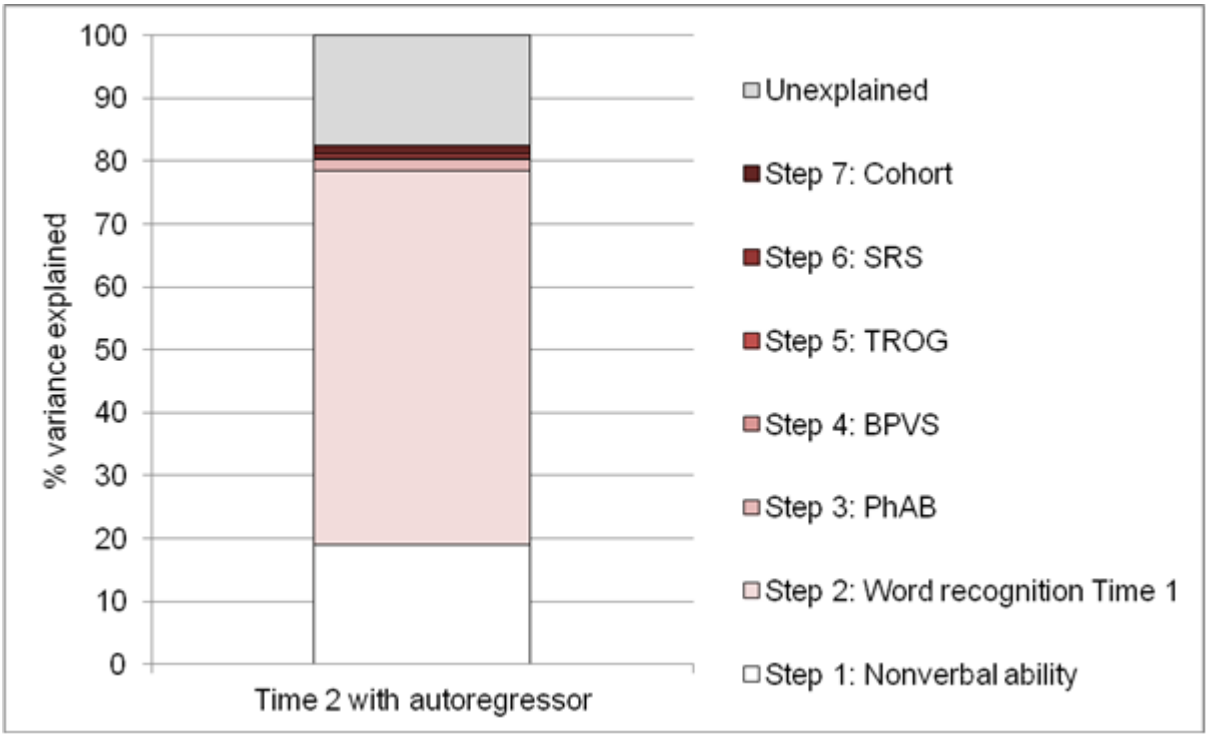

Figure 3.58. Regression analysis predicting word recognition at Time 2, controlling for the autoregressor (word recognition at Time 1)

The model in Figure 3.58 explained a high proportion (82.4%) of the variance in word recognition overall and significant variance was explained at steps 1, 2, 3 and 7. When we inspected standardised β weights for models with all variables included, word recognition at Time 1, phonology and cohort were significant unique predictors of word recognition skills at Time 2. The significant role of cohort in these regression models indicates that the pattern across predictors is different within LI and ASD cohorts. To explore this further, we conducted separate regression analyses predicting word recognition at Time 2 (controlling for Time 1 word recognition) for each cohort. These regression analyses must be interpreted with caution as data were only available for 70 pupils in the LI cohort and 49 pupils in the ASD cohort. These are smaller samples than would typically be recommended for regression analyses with six predictors (Field, 2005). The results of these regressions are presented in Figure 3.59.

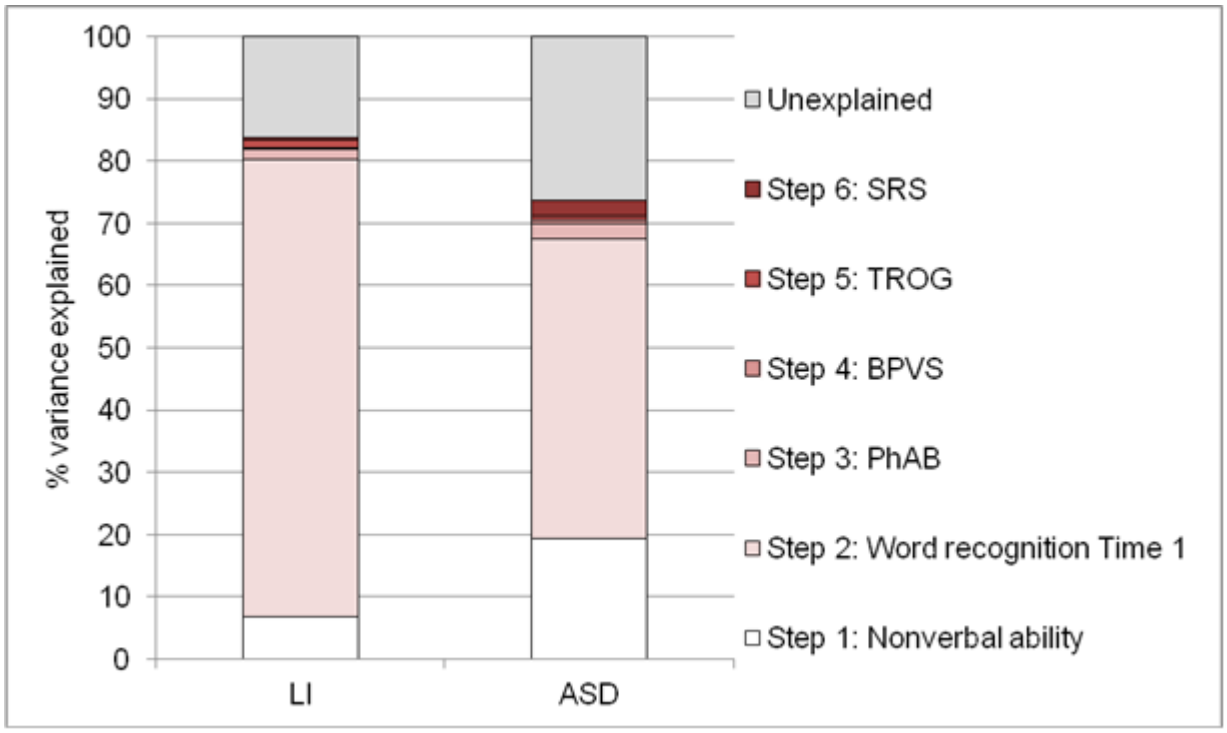

Figure 3.59. Regression analyses for LI and ASD cohorts predicting word recognition at Time 2

The regression models presented in Figure 3.59 explained a high proportion of the variance in Time 2 word recognition (83.8% for LI and 73.7% for ASD). For the LI cohort, steps 1, 2, 3 and 5 explained significant additional variance in Time 2 word recognition and standardised β weights (from a model with all variables included) indicated that Time 1 word recognition and phonology were unique predictors of Time 2 word recognition. In contrast, in the ASD model, only steps 1 and 2 explained significant additional variance, with only Time 1 word recognition emerging as a unique predictor according to standardised β weights. It is worth noting that for the ASD model, there was a trend for autism symptomatology to be a unique predictor of Time 2 word recognition. As mentioned above, these results must be interpreted tentatively. Nonetheless, they indicate that after controlling for the powerful effect of earlier word recognition ability, phonological abilities explained significant unique variance in the word recognition skills of pupils with LI, and there was a trend for severity of autism features to explain unique variance in the word recognition skills of pupils with ASD.

3.13.1.2. Reading comprehension

Two hierarchical regression analyses were conducted to investigate which factors explain unique variance in reading comprehension at Time 1 and Time 2 (see Figure 3.60). At Time 1 analyses were possible across 106 pupils and at Time 2 across 101 pupils (70% of the sample).

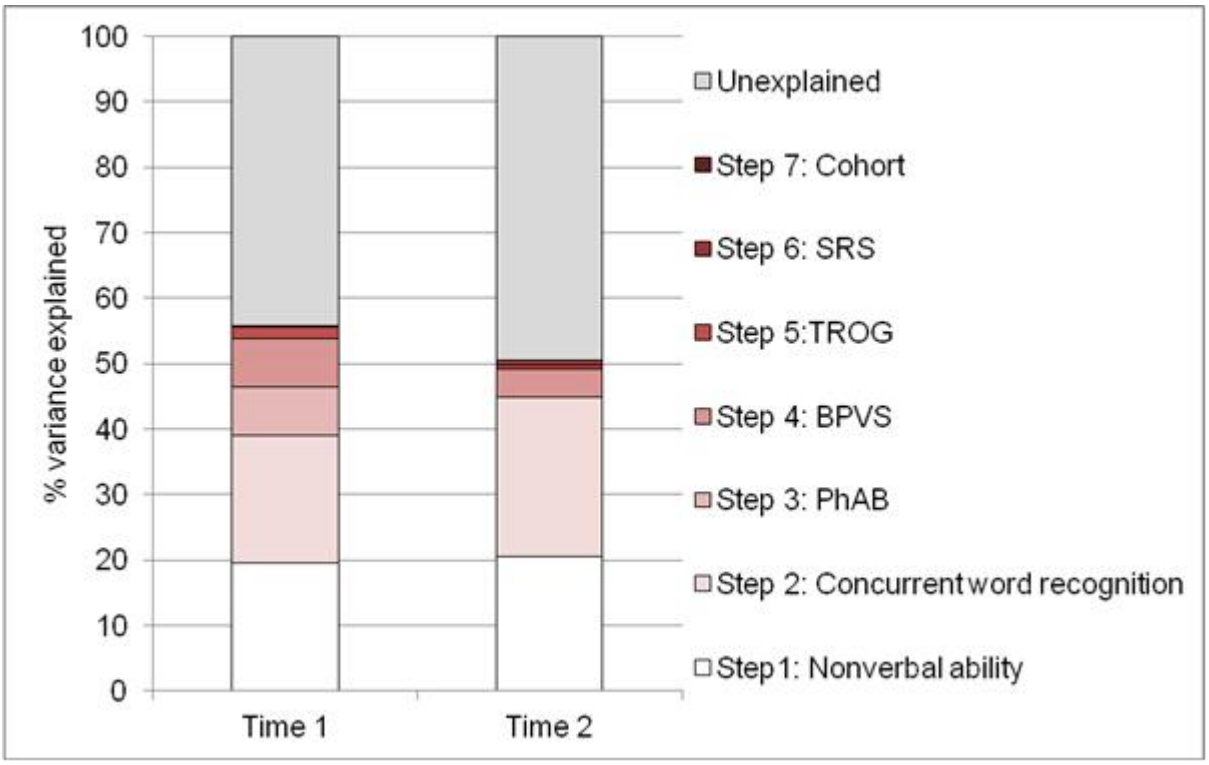

Figure 3.60. Regression analyses predicting reading comprehension at Time 1 and Time 2

Regression analyses predicting reading comprehension at Time 1 and Time 2 were identical to those conducted for word recognition with one exception. Since word recognition abilities play an important role in the ability to understand texts, this variable was added into models at step 2. As indicated by Figure 3.60, Time 1 reading comprehension was predicted by nonverbal ability (step 1), Time 1 word recognition (step 2), phonology (step 3), Time 1 receptive vocabulary (step 4), Time 1 receptive grammar (step 5), Time 1 autism symptomatology (step 6) and cohort (step 7). The analysis for Time 2 reading comprehension was identical except that the concurrent Time 2 (and not Time 1) measure of word recognition was included in this case.

The Time 1 model explained a moderate 44.3% of the variance in reading comprehension and the Time 2 model explained 49.4%. At Time 1, significant additional variance was explained at steps 1, 2 3, 4 and 5 but standardised β weights (for a model with all variables included) indicated that only word recognition and receptive vocabulary were significant unique predictors. There was also a trend for receptive grammar to be a unique predictor (p = .05). At Time 2 the pattern was essentially the same, steps 1, 2 and 4 explained significant additional variance but only word recognition and receptive vocabulary were significant unique predictors of reading comprehension (according to standardised β weights).

A third regression model was conducted with the autoregressor (reading comprehension at Time 1) included at the second step (see Figure 3.61). Otherwise, this model was identical to the Time 2 reading comprehension regression described above. This model explained 45.5% of the variance in Time 2 reading comprehension. Steps 1, 2, 3 and 5 explained significant additional variance but again, it was word recognition and receptive vocabulary that emerged as significant unique predictors of reading comprehension (according to standardised β weights).

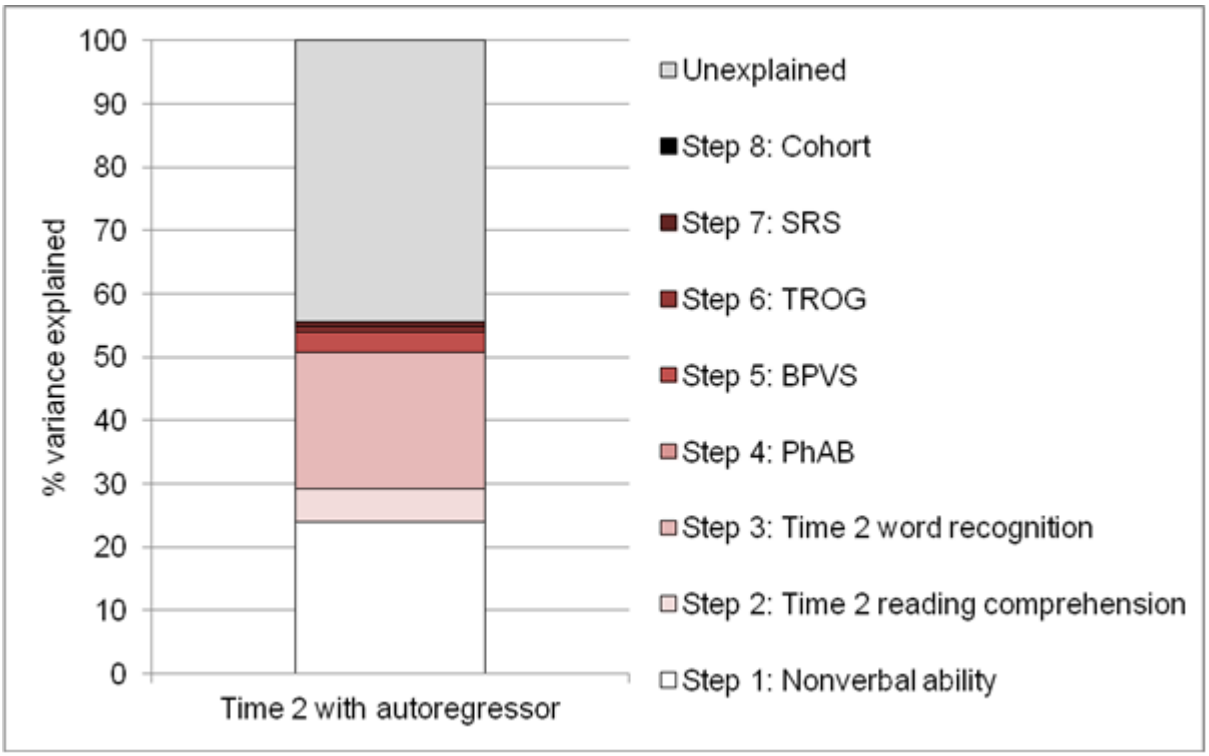

Figure 3.61. Regression analysis predicting reading comprehension at Time 2, controlling for the autoregressor (reading comprehension at Time 1)

Box 3.19. Summary: Predicting reading

- When pupils with LI and ASD were considered together, phonology, and to a lesser degree receptive vocabulary, emerged as factors that explain individual differences in word recognition. In addition, pupils' word reading skills at Time 1 were powerful indicators of word recognition scores at Time 2.
- When we considered LI and ASD cohorts separately, the pattern of findings was different.
    - After controlling for the powerful effect of earlier word recognition ability, phonological skills played a role in explaining individual differences in the word recognition abilities of pupils with LI such that better phonological skills were associated with more advanced word recognition.
    - For pupils with ASD however, phonological skills were not associated with word recognition. Instead, there was a trend for better word recognition skills to be associated with less severe autism symptomatology for the pupils with ASD.
- Therefore, it appears that word recognition in LI and ASD is underpinned by different factors. However, findings from separate LI and ASD models must be interpreted with caution due to the small number of data points available for each group in this analysis.
- Word recognition and receptive vocabulary emerged as the most important factors for explaining reading comprehension performance, irrespective of cohort.
- Interestingly, earlier reading comprehension did not explain significant variance in later reading comprehension after controlling for other reading, language and autism symptomatology variables.

3.13.2. Which factors explain variation in attainment on national curriculum tests?

The DfE provided information on national curriculum tests at Key Stages 1 and 2. Four hierarchical regressions were conducted to investigate whether age, nonverbal ability, language, autism symptomatology and cohort (LI vs. ASD) explained variation in scores on English and maths tests at both Key Stages 1 and 2. For Key Stage 1 tests analyses were conducted across 97 pupils from school years 1, 3 and 5 (87% of pupils from these year groups) and for Key Stage 2 tests across 70 pupils from Years 5 and 7 (86% of pupils from these year groups). In these analyses raw scores were used, rather than *Z* scores that correct for age as above. Therefore, in all analyses age was entered as a control variable at the first step. Nonverbal ability was entered at step 2, followed by language (as indexed by

the BPVS measure of receptive vocabulary: step 3), autism symptomatology (SRS: step 4) and cohort (step 5). Figure 3.62 presents the variance explained by each step in Key Stage 1 English, Key Stage 1 maths, Key Stage 2 English and Key Stage 2 maths scores.

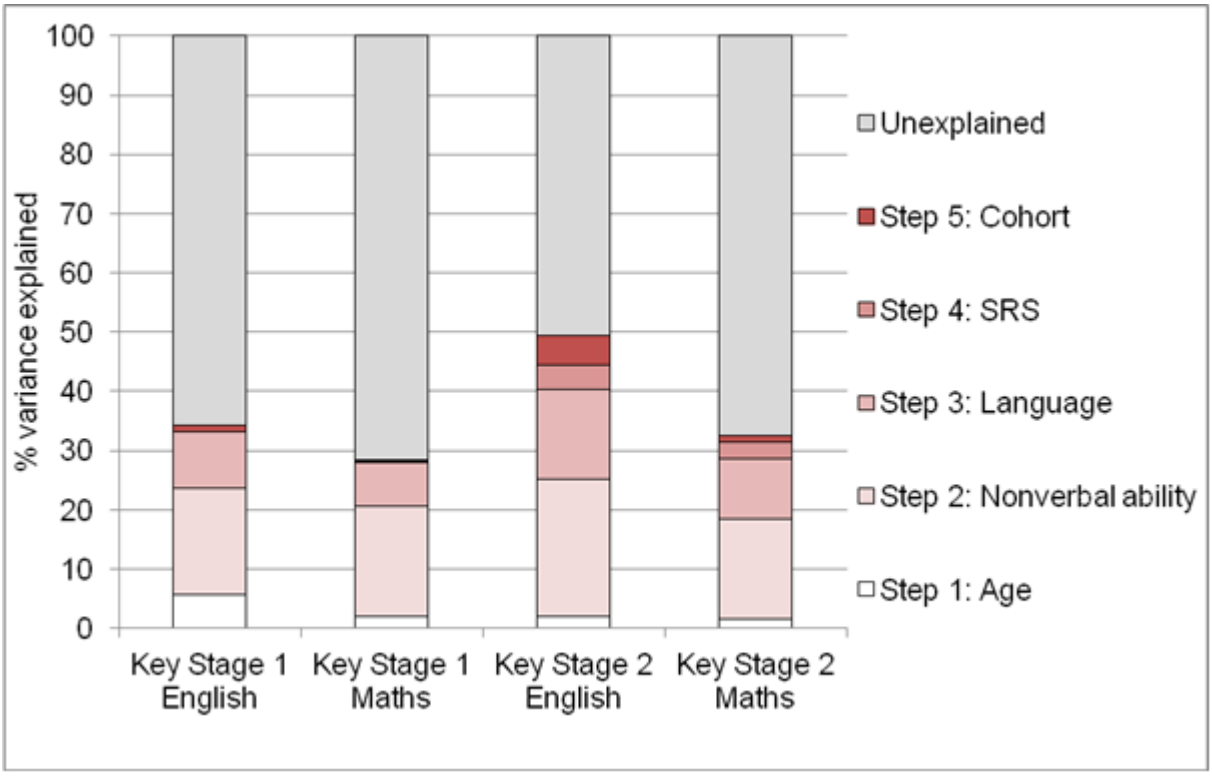

Figure 3.62. Regression analyses predicting Key Stage 1 and 2 attainment

Key Stage 1 regression models explained a modest proportion of the variance in attainment (English = 34.3%, maths = 28.3%). For the Key Stage 1 English regression, significant additional variance was explained at steps 1, 2, and 3 and for maths significant additional variance was explained at steps 2 and 3. When we inspected standardised β weights for models with all variables included, age, nonverbal ability and language were significant unique predictors of both Key Stage 1 English and Key Stage 1 maths attainment.

Again, Key Stage 2 regression models explained a modest proportion of the variance in attainment (English = 49.4%, maths = 32.6%). For Key Stage 2 English, steps 2, 3, 4 and 5 were significant and standardised β weights indicated that nonverbal ability, language, autism symptomatology (SRS) and cohort were all significant unique predictors. A different pattern was observed for Key Stage 2 maths. Here, steps 2 and 3 were significant and standardised β weights conferred a significant role for nonverbal ability and language. It is worth noting that for Key Stage 2 maths there was a trend (according to standardised β weights) for autism symptomatology to be a significant predictor.

Box 3.20. Summary: Predicting school attainment

- Regression models indicated that nonverbal and language abilities are important factors in predicting attainment on Key Stage 1 and 2 English and maths national curriculum tests.
- For Key Stage 2 tests, there was some indication that the degree of autism symptomatology predicted attainment. This was clear for English and a trend was evident for maths.

3.13.3 Which factors explain emotional and behavioural difficulties?

Two hierarchical regression analyses were conducted to investigate whether nonverbal ability, language, autism symptomatology and cohort (LI vs. ASD) explained unique variance in behavioural difficulties as measured by the SDQ at Time 1 and Time 2 (see Figure 3.63). Analyses were possible across 94 pupils at Time 1 and Time 2 (55% of the sample). Nonverbal ability was entered as a control variable at the first step followed by our measures of language (BPVS and TROG: step 2), autism symptomatology (SRS: step 3) and cohort (step 4). *Z* scores were used in all analyses as this allowed us to account for age while minimising the number of predictor variables. Figure 3.63 presents the percentage of variance explained at each step of this hierarchical regression.

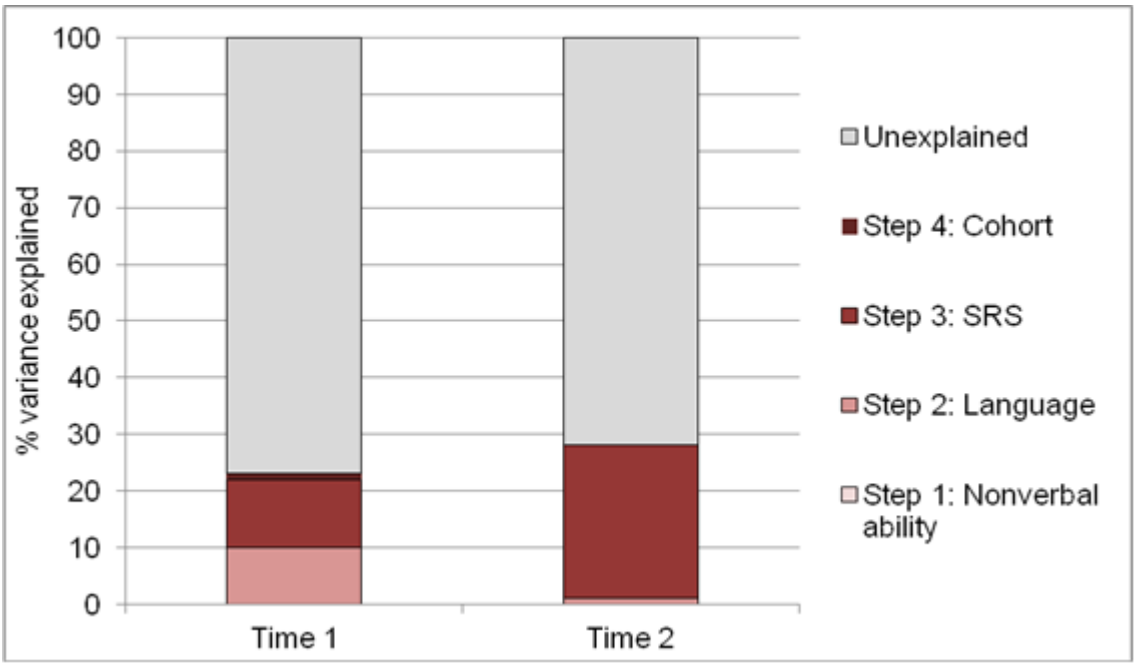

Figure 3.63. Regression analyses predicting SDQ emotional and behavioural problems at Time 1 and Time 2

The regression models presented in Figure 3.63 explained a modest portion of the variance at Time 1 (24%) and Time 2 (29%). At Time 1 the significant predictors of emotional and behavioural difficulties (SDQ Total Difficulties Score) were language abilities as measured by the BPVS and TROG (predicting 10% of the variance, with lower language ability being associated with higher levels of emotional and behavioural difficulties) and autism symptomatology as measured by the SRS (which accounted for 12% of the variance on the SDQ with higher levels of autism symptoms being associated with elevated levels of emotional and behavioural problems). At Time 2 only autism symptoms on the SRS significantly predicted emotional and behavioural difficulties (27%). Standardised β weights (for models with all variables included) indicated that at Time 1 only receptive vocabulary and autism symptomatology were significant unique predictors and at Time 2 only autism symptomatology was a unique predictor.

Equivalent regression analyses were conducted with the KIDSCREEN, to examine predictors of self-reported quality of life at Time 1 and Time 2. Analyses were possible across 103 pupils at both Time 1 and Time 2 (60% of the sample). Nonverbal ability was entered as a control variable at the first step followed by our measures of languages (BPVS and TROG: step 2), autism symptomatology (SRS: step 3) and cohort (step 4). Again *Z* scores were used in all analyses as this allowed us to account for age while minimising the number of predictor variables. Figure 3.64 presents the percentage of variance explained at each step of this hierarchical regression.

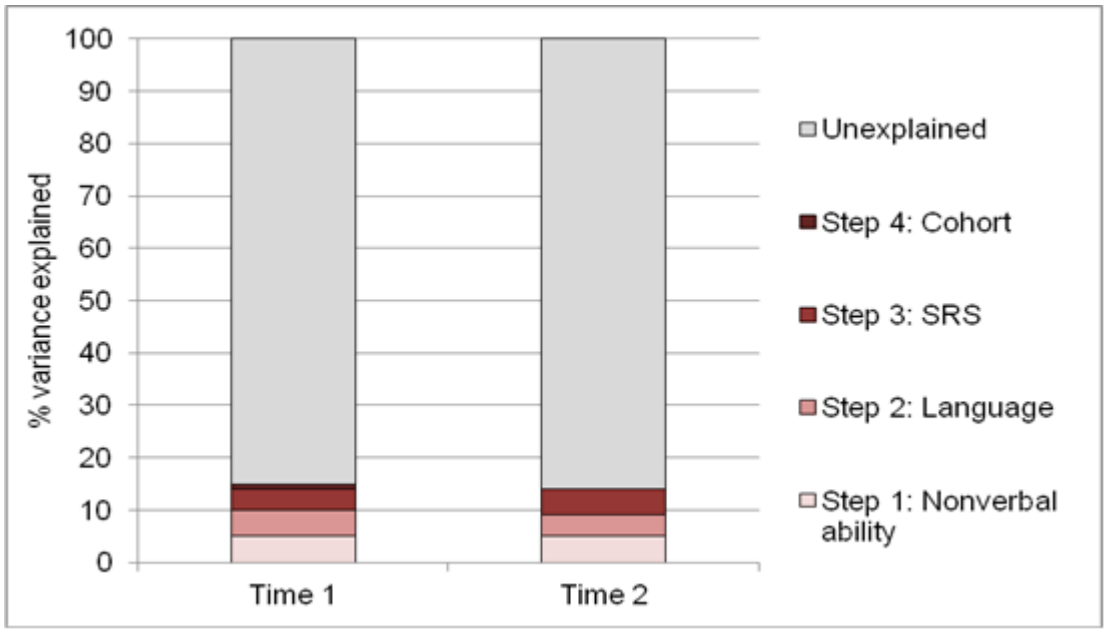

Figure 3.64. Regression analyses predicting KIDSCREEN psychological well-being at Time 1 and Time 2

The regression models presented in Figure 3.64 explained a modest portion of the variance in psychological well-being at Time 1 (15%) and Time 2 (14%). At Time 1, both nonverbal ability (5% of variance) and autism symptomatology (4%) were significant predictors and a similar pattern was found at Time 2 with both nonverbal abilities (5% of variance) and autism symptomatology (5% of variance) being associated with self-reported quality of life. Standardised β weights (for models with all variables included) indicated that at Time 1 none of the variables predicted psychological well-being and at Time 2 autism symptomatology approached significance (*p*=.06).

Box 3.21. Summary: Predicting emotional and behavioural difficulties

- Language abilities and levels of autism characteristics were associated in the sample with levels of emotional and behavioural difficulties, and (marginally) self-reported psychological well-being.
- However, all of these effects were modest, accounting for small amounts of variance in behavioural difficulties and quality of life.

3.13.4. Which factors explain individual differences in classroom learning contexts and teacher reported differentiation?

As described above, we used a range of measures to assess pupils' language, cognitive and social skills. We have identified key measures from each domain to examine whether they are related to classroom observations (proportion of time working with the LSA and task differentiation in class) and the two factors identified from the teacher questionnaires about differentiation (*content* and *structure*). Four hierarchical regression analyses were conducted to investigate which factors explain unique variance for each of these variables. In each regression nonverbal ability was entered at the first step followed by our measure of working memory (AWMA; step 2), receptive vocabulary (BPVS; step 3), autism symptomatology (SRS; step 4) and cohort (LI vs. ASD; step 5).

3.13.4.1. In the classroom

Our first analysis examined the predictors of time working with a LSA from the classroom observation data.

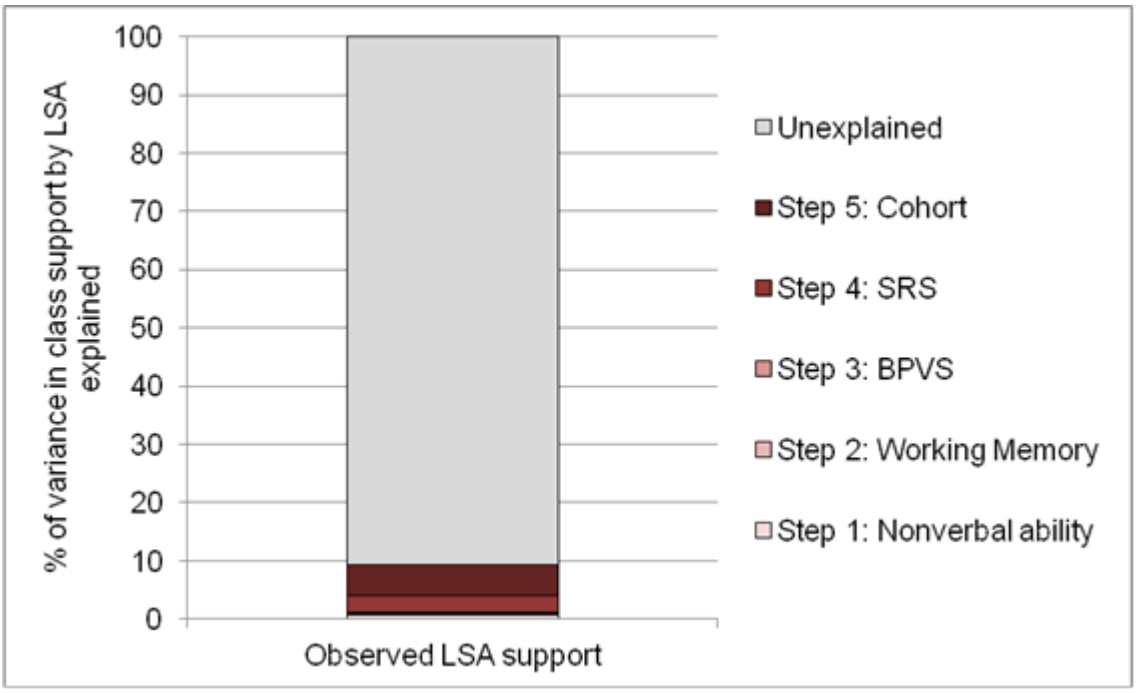

Figure 3.65. Regression analysis predicting time spent working with a LSA from classroom observations

Figure 3.65 presents the percentage of variance explained at each of these steps for time working with a LSA. The figure also indicates the amount of variance left unexplained by the model (total variance explained 9.4%). In the model, significant variance was explained only at step 5 and standardised β weights for the model with all variables included indicated that only cohort was a significant unique predictor.

Our second analysis examined the proportion of task differentiation observed during the English language or literacy lessons. Figure 3.66 presents the percentage of variance in this variable explained at each step of the regression. The figure also indicates the amount of variance left unexplained by the model (total variance explained 13%). In the model, significant variance was explained at steps 4 and 5 and standardised β weights for the model with all variables included indicated that only working memory was a significant unique predictor.

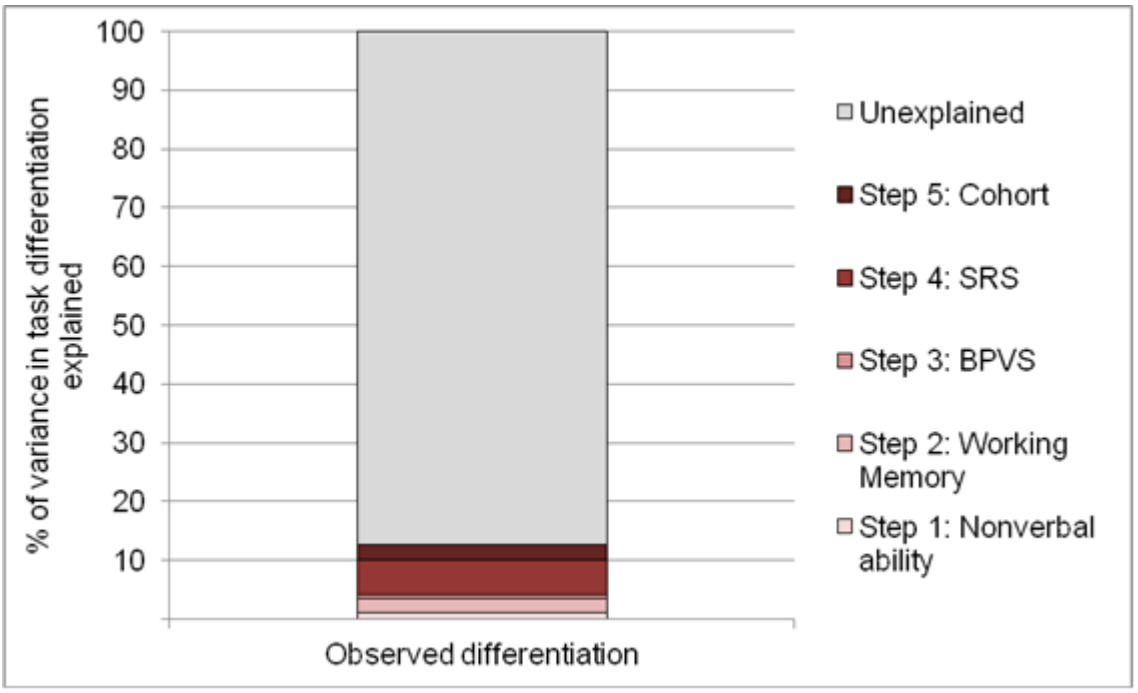

Figure 3.66. Regression analysis predicting observed teaching and learning differentiation in language/literacy lessons

3.13.4.2. Teacher reports on strategies used

In section 3.9 we identified two factors which, at Time 1, differentiated the teachers' reported approaches to classroom instruction for the pupils. Here we consider whether our measures of cognition, language and autism symptomatology reflect the use of these different approaches. Figure 3.67 presents the percentage of variance explained at each of these steps for the two reported factors. The figure also indicates the amount of variance left unexplained by the model (total variance explained *content* 23.2%, total variance explained *structural* 9.4%). In the model for *content,* significant variance was explained at steps 3, 4 and 5 and standardised β weights for the model with all variables included indicated that only vocabulary was a significant unique predictor. In contrast for the model for *structure* significant variance was explained at steps 4 and 5 and standardised β weights for the model with all variables included indicated that only the SRS was a significant unique predictor.

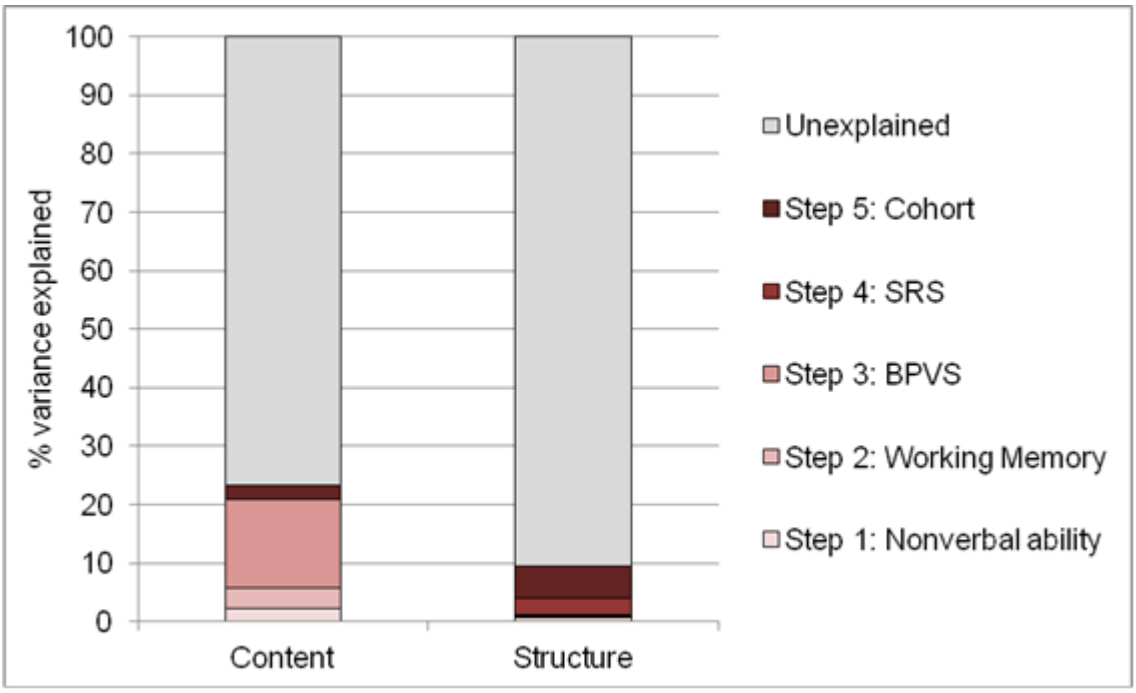

Figure 3.67. Regression analysis predicting teachers reported use of different strategies (Time 1)

Box 3.22. Summary: Predicting individual differences in the classroom

- Overall, these models suggest that different pupil characteristics influence what is happening in classrooms and what teachers report they are doing. Although the overall variance explained by models is modest, they indicate a number of important associations.
- As we reported in the observation section, more pupils with ASD than LI were seen to be working with the LSA. Cohort (LI/ASD) was the only factor that accounted for unique variance in the model predicting observed LSA support.
- We found few cohort differences for task differentiation in the observation data. In the model predicting task differentiation working memory was the only factor that explained unique variance.
- The factors we identified from the teacher questionnaire at Time 1 provide a different pattern. Vocabulary levels predicted modification of the content of the curriculum (content factor) while severity of autism symptoms predicted making structural observations to the teaching content (content factor).

4. CONCLUSIONS AND IMPLICATIONS FOR POLICY AND PRACTICE

We have collected data to profile the language, cognition and social communication needs of 162 pupils with language impairment (LI) or autism spectrum disorders (ASD) whom we grouped according to nonverbal ability (LI-av-NV, LI-low-NV, ASD-av-NV and ASD-low-NV), resulting in four cohorts. To complement results from standardised assessments, we observed pupils in their classrooms during language and literacy lessons, collected information from teachers about their approaches to teaching and learning, were informed by SENCOs about resource provision and spoke to parents about their children and their needs. The project aimed to examine three main issues pertaining to pupils with LI and ASD in mainstream settings:

1. Differences and overlap in profiles of need for LI and ASD cohorts
2. How schools addressed the pupils' needs
3. How parents understood their children's needs and they ways in which they were being addressed in school

The previous sections have examined each of these questions in detail. Here we identify four overarching issues that have implications for the ways in which the needs of these pupils are identified and met in classrooms and by schools.

4.1 Language learning needs

For LI and ASD cohorts it was evident that pupils were experiencing difficulties with core aspects of the language system including receptive and expressive language, and subcomponents of language such as vocabulary and grammar. A consistent pattern of cohort differences was observed across a number of these structural language measures such that the ASD-av-NV cohort significantly outperformed the other three cohorts and the ASD-low-NV performed midway between the ASD-av-NV and LI cohorts. There was evidence that older pupils with LI were experiencing greater difficulties with expressive and receptive language than their younger counterparts.

As was the case for structural language, pupils presented with depressed performance across most measures of pragmatic language and social communication. Participants recruited at older ages were also experiencing higher levels of pragmatic difficulty than younger pupils. However, on indices of pragmatic language and social communication, it was the pupils with ASD that exhibited greater impairment than those with LI.

Scores on a measure of phonology indicated less impairment in this domain than in other aspects of structural language (i.e. vocabulary, grammar). This may reflect the age at which

the cohorts were recruited. In even the youngest age group (those recruited in Year 1), we would expect basic phonological skills to be in place. Nonetheless, phonological scores were depressed relative to test norms, which will likely impact on word recognition, spelling and writing (e.g., Connelly, Dockrell & Barnett, 2011; Muter et al., 2004). Indeed, in regressions predicting word recognition, phonology emerged as a significant unique predictor of word recognition at Time 2 even after controlling for the powerful effects of earlier word recognition at Time 1.

Both LI cohorts and the ASD-av-NV cohort exhibited performance on a number of language measures that was significantly poorer than performance on nonverbal measures. For example, this pattern of findings was observed when pupils completed both verbal and nonverbal tasks that were co-normed. For the ASD-low-NV cohort, there was a trend for a significant difference between lower verbal performance and higher nonverbal performance. Overall, this suggests that even for pupils with lower levels of nonverbal ability language learning is compromised relative to nonverbal ability.

Despite differences between cohorts, there was substantial overlap between the populations indicating that the level of difficulty varied both within and between cohorts. Previous studies comparing participants with LI and ASD have typically recruited them from clinical settings and have observed both social and communication impairments in children and adolescents presenting with LI (typically SLI in these studies e.g., Leyfer et al., 2008) and clinically relevant language difficulties in those recruited on the basis of their ASD diagnosis (e.g., Kjelgaard & Tager-Flusberg, 2001). In our mainstream sample we replicated these findings. The weaknesses in language and social communication observed in our LI and ASD cohorts will likely impact on pupils' experiences in school, particularly in relation to literacy, accessing the curriculum and interactions with adults and peers.

4.2 Academic achievement and literacy

Measures of academic achievement were available from the DfE in terms of Key Stage national curriculum test results. We also administered standardised measures to profile in more detail the pupils' skills in reading, spelling and writing.

There were no cohort differences on Key Stage 1 national curriculum tests. However, on Key Stage 2 English and science tests pupils with ASD scored significantly higher than pupils with LI, which may suggest that differences between the cohorts on these aspects of the curriculum emerge over time. Performance on both Key Stage 1 and 2 national curriculum

tests was available for a subgroup of our sample. Progress did not differ across cohorts, providing some evidence for equivalent learning in LI and ASD pupils. We also used an experimental paradigm to investigate learning online and over a short period of time. On this measure groups also showed equivalent amounts of learning.

Standardised measures of reading, spelling and writing were administered to provide more sensitive measures of literacy than national curriculum tests. Across a number of literacy measures pupils with LI showed a greater degree of difficulty than pupils with ASD. However, as with the language measures, these group differences masked overlap in performance between the LI and ASD cohorts. The longitudinal analysis indicated that word recognition scores were stable but there was a significant reduction in reading comprehension for both LI and ASD pupils over a period of approximately one year. This indicates that relative to typically developing peers, reading comprehension in these pupils was worsening over time.

Few studies have investigated writing in LI and ASD samples (for exceptions see Connelly, Dockrell & Barnett, 2011; Mayes & Calhoun, 2003). Our study showed that mean spelling scores for the LI cohorts were depressed relative to the normative test mean whereas the two ASD cohorts obtained means that were approximately commensurate with norms. On a measure of writing fluency, all cohorts showed depressed performance, with means substantially below the average range. Despite differences in absolute performance, the same pattern of cohort effects was observed across spelling and writing fluency measures: the ASD-av-NV cohort significantly outperformed the LI-low-NV cohort and there were no other cohort differences. As well as administering standardised writing assessments, we asked pupils to produce connected texts in response to a prompt. On this task a significant minority of pupils did not produce any connected text and for those participants who did produce written texts, they were limited and error prone.

4.3 Social, emotional and behavioural difficulties

Teachers described rates of emotional and behaviour problems that were significantly elevated compared to population norms. However, these did not include conduct problems and we found little evidence of disruptive behaviour in the classroom and neither did parents report conduct problems as a concern. LI and ASD profiles were similar on indices tapping emotional problems, conduct/behavioural problems and hyperactivity, indicating that both groups showed significant emotional and social difficulties at school. Reported difficulties with peer interactions and prosocial behaviours were higher in the ASD cohort than the LI

cohort, reflecting particular difficulties with social communication in the pupils with ASD. For pupils with LI, social interaction with same age peers was a greater issue for older than younger pupils. Elevated levels of autism characteristics were associated with greater emotional and behavioural difficulties at both time points. In addition, at Time 1, lower levels of receptive vocabulary were also associated with emotional and behavioural difficulties.

Pupils reported on their own quality of life. On this measure, the ASD cohort but not the LI cohort reported low levels of quality of life compared to the normative sample on all subscales. For the mood and emotions subscale and the social acceptance and bullying subscale both cohorts reported low levels of quality of life compared to the normative sample. This differs from parents' reports where victimization was mentioned by only about a tenth of parents, although by twice as many parents of children with ASD than LI.

4.4 Teaching and learning

During the screening phase we found evidence that the use of mainstream resources reflected differences between the cohorts on continuous measures of language and autism symptomatology. At this stage of the project all participants were being educated in one of two types of provision: either mainstream schools with no specialist language or ASD provision (the majority), or in mainstream schools with specialist language or ASD provision. Recalling sentences (an expressive measure of language) differentiated between pupils placed in mainstream settings with language provision and those placed in other types of setting, such that pupils with lower language scores were more likely to be found in a mainstream school with attached language provision. Pupils with more impaired scores on our screening measure of autism symptomatology were more likely to be attending a mainstream school with ASD provision than a mainstream school with language provision. However, variation on the autism symptomatology measure did not differentiate between pupils placed in a mainstream school without specialist provision and those placed in either of the settings with SEN provision. It is worth noting that these findings must be interpreted with caution as the number of pupils being educated in mainstream settings with attached SEN provision at screening was small.

We anticipated that pupils' profiles of strengths and needs would raise challenges for classroom practice. Variation in pupil performance on the standardised measures was captured both in the way teachers reported differentiating the curriculum and in terms of what we observed in the classroom.

Using factor analysis, we were able to distinguish between teacher reported differentiation of what was being taught (a *content* factor) and how pupils were being taught (a *structure* factor). Cohort comparisons on content and structure factors revealed few differences. In contrast, correlation analyses and regressions using the pupils' scores on the standardised measures indicated that the two factors were associated with different variables. Reported differentiation of the *content* of teaching was negatively correlated with pupils' levels of receptive and expressive language, word reading and spelling. The lower pupils scored on these measures, the greater *content* differentiation was reported. Using receptive vocabulary as a proxy for language in the regression analyses confirmed the importance of oral language as a predictor of *content* differentiation.

Teacher reported *structural* differentiation was associated with greater levels of autism symptomatology at Time 1 and Time 2. At Time 2 there were also small, but significant, negative correlations between structural differentiation and measures of both receptive language and word reading. A regression analysis indicated that *structural* differentiation was predicted only by the pupils' levels on the SRS. In sum, teacher modification of curricular content (the content factor) was related to language abilities whereas teacher alterations to the way teaching was structured (the structure factor) were related to levels of social impairment. Neither factor was associated with the pupil's level of nonverbal ability. Indeed throughout our analyses of the data nonverbal ability was not associated with support or resources.

The classroom observations of English language and literacy lessons allowed us to directly examine differentiation and support, which complements our findings from teacher and SENCO reports. It was clear from the observations that pupils with ASD were receiving more LSA support in class and were withdrawn more frequently than pupils with LI. Diagnostic group (LI vs. ASD) was the only variable which predicted LSA support in our regression analyses. Our observations of curriculum differentiation revealed a different pattern. Here the observation data suggested that it was the ASD-low-NV pupils who received the greatest amount of curricular differentiation at an individual level, while the other cohorts did not differ. In our regression analyses, observed differentiation in the classroom was predicted by pupils' scores on the measure of working memory. This association indicates that difficulties are not restricted to areas of language and communication and those pupils' problems with working memory place added demands on school staff to support the pupils' learning.

Across observations and from both teacher and SENCO reports there was little evidence of the use of specialist programmes to support the pupils, or involvement by other

professionals such as EPs or paediatricians. In contrast, significant numbers of pupils were reported to be supported by LSAs and SLTs. Pupils with ASD were more likely to be supported in classrooms by a LSA or to be outside the class when the observations were occurring. In addition, parents, teachers and SENCOs reported that pupils with ASD were receiving more SLT input.

4.5 Conclusions

The majority of pupils with LI and ASD are educated in mainstream schools and specialist resources. In the educational settings that we sampled, there was both marked variability within the cohorts and substantial overlap between the cohorts on many of the measures taken. Pupils in the mainstream schools that participated in our study presented with significant language learning needs, irrespective of identified primary SEN (LI vs. ASD). Overlap was observed across many domains including literacy, attainment as measured by national curriculum tests, and social and emotional functioning. Nonetheless, we also observed differences between the cohorts in mean scores for some of the measures. As would be expected, pupils with ASD showed greater impairments across instruments designed to tap autism symptomatology whereas pupils with LI showed greater need on measures of language, and in some cases literacy. However, these mean differences need to be interpreted with awareness that there were not clear boundaries between the groups. Our interviews with the parents about their children supported this pattern of results.

Reports from parents and SENCOs indicated that pupils with ASD were significantly more likely to attract resources than those with LI. We also observed differential allocation of resources during English language and literacy lessons where we would particularly expect pupils with LI to be experiencing greater need. The current data suggest that a diagnosis of ASD results in receiving more resources despite the fact that on measures of core language (and in some cases literacy) pupils with LI often exhibit greater difficulty.

We collected information from parents, teachers and SENCOs on how pupils were supported. Teachers and parents focussed on provision from LSAs and SLTs and made little reference to involvement by other professional groups. SENCOs reported the hours of support provided within school and by staff external to the school. Again, there was little mention of professionals external to the school other than SLTs. We found that the main sources of support to address pupils' needs occurred within the schools. This support in schools included both SENCO and teacher expertise and the use of LSAs. For many pupils SLTs were also important: this was true across both cohorts but pupils with ASD attracted

more SLT resource. SLT involvement was significantly lower in secondary than primary schools. A reduction in SLT input in secondary school is particularly noteworthy as we found evidence on a selection of language and communication measures indicating that older pupils were experiencing greater levels of need than those identified at younger ages.

Our results indicate strongly that national curriculum data and/or establishing a pupil's primary need provides insufficient information to plan services and differentiate the curriculum. The significant overlaps between the cohorts in terms of individual positions on the various dimensions point to the importance of *"the identification of each child's difficulties on a case by case basis"* (McLaughlin et al, 2006).

4.6 Implications for practice, research and policy

1. Substantial overlap between the needs of pupils with LI and ASD, as well as differences between these cohorts, highlights the importance of a personalised approach to teaching and learning which reflects an understanding of a pupil's
    a. language learning and literacy needs,
    b. social and communication difficulties
    c. and academic progression
2. Reconsideration is needed about the ways in which pupils' needs are identified at the school, LA and national level. More sensitive data than are currently collected (Key Stage assessment) will allow better
    a. identification of need
    b. and monitoring of progress
3. There is a need to examine the ways in which SLT support and working practices support pupils across
    a. the primary and secondary school sector
    b. language learning and social communication
4. Resources need to be targeted according to both language learning needs and social communication needs
5. Pupils' needs will primarily be met within schools and classrooms. Schools will need to
    a. be aware of the wider impact of language and communication on well-being, behaviour and peer relationships
    b. and consider explicitly addressing these issues in the support of these pupils

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APPENDIX 1 – BCRP REPORTS

All the BCRP reports are available from the BCRP page on the Department for Education's website: http://www.education.gov.uk/researchandstatistics/research and also from the BCRP page in the CEDAR, University of Warwick website: http://www.warwick.ac.uk/go/bettercommunication

Main report

1. Lindsay, G., Dockrell, J., Law, J., & Roulstone, S. (2012). *Better communication research programme: Improving provision for children and young people with speech, language and communication needs.* London: DfE.

This report presents the main recommendations of the whole Better Communication Research Programme (BCRP). It draws on evidence provided in the thematic and technical reports. This report also considers the overall implications for policy, practice and research, and indeed seeks to bridge the gap between this substantial research programme and the policy and practice agenda.

Interim reports

2. Lindsay, G., Dockrell, J.E., Law, J., Roulstone, S., & Vignoles, A. (2010) *Better communication research programme 1st interim report DfE-RR070. London: DfE*. (70pp). http://publications.education.gov.uk/eOrderingDownload/DFE-RR070.pdf

This report presents interim findings from the project that had been underway between January and July 2010; best evidence on interventions; the academic progress of pupils with SLCN; economic effectiveness; the initial phase of the prospective longitudinal study of children and young people with language impairment (LI) and autism spectrum disorder (ASD); and the preferred outcomes of children and young people with SLCN, and of their parents.

3. Lindsay, G., Dockrell, J.E., Law, J., & Roulstone, S. (2011) *Better communication research programme 2nd interim report. DFE-RR 172*. London: DfE. (131pp). https://www.education.gov.uk/publications/eOrderingDownload/DFE-RR172.pdf

This report presents interim findings of the project that had been underway between July 2010 – January 2011. Further work is reported from analyses of the national pupil data sets examining development and transitions of pupils with SLCN or ASD between categories of special educational needs, the prospective study, and parents' preferred outcomes (an online survey). In addition, interim reports from new projects include: the initial phase of development of a Communication Supporting Classrooms Tool; a survey of speech and language therapists' practice regarding interventions; a study of language and literacy attainment during the early years through Key Stage 2, examining whether teacher assessment provides a valid measure of children's current and future educational attainment (led by Margaret Snowling and Charles Hulme); two studies of the relationship between SLCN and behaviour, with Victoria Joffe and Gillian Baird respectively; cost effectiveness of interventions; and the setting up of a prospective cohort study of speech and language therapy services for young children who stammer.

Thematic reports

4. Dockrell, J., Ricketts, J. & Lindsay, G. (2012). *Understanding speech, language and communication needs: Profiles of need and provision.* London: DfE.

This thematic report examines the nature of speech language and communication needs and the evidence from BCRP studies that have explained both the nature and needs encompassed by the category and the provision made to meet those needs. This report draws upon six projects (8, 9, 10, 11, 14 and 15).

5. Law, J., Beecham, J. & Lindsay, G. (2012). *Effectiveness, costing and cost effectiveness of interventions for children and young people with speech, language and communication needs.* London: DfE.

This thematic report first considers the nature of evidence based practice in health and education before reviewing the evidence for the effectiveness of interventions for children and young people with SLCN. The report also considers cost effectiveness and how it might be measured before examining the evidence of the cost effectiveness of SLCN interventions. The report draws on projects, 8, 10, 11 and 12.

6. Lindsay, G. & Dockrell, J. (2012). *The relationship between speech, language and communication needs (SLCN) and behavioural, emotional and social difficulties (BESD).* London: DfE.

This thematic report explores the relationship between SLCN and behavioural, emotional and social difficulties. . We argue that there are different patterns of relationship between SLCN and ASD, and different types of behavioural, emotional and social difficulties. The report draws on the 2nd interim report (report 3) and project reports 9, 11 and 15.

7. Roulstone, S. & Lindsay, G. (2012). *The perspectives of children and young people who have speech, language and communication needs, and their parents.* London: DfE.

The BCRP ensured that the perspectives of parents and children were explored through a number of different projects. This project explores the evidence primarily from projects 9 and 12, drawing on evidence from a series of specific studies of parents' and children's perspectives and also those of the parents in our prospective study.

Technical reports

8. Dockrell, J. E., Bakopoulou, I., Law, J., Spencer, S., & Lindsay, G. (2012). *Developing a communication supporting classroom observation tool.* London: DfE.

This study reports the development of an observational tool to support teachers, SENCOs, speech and language therapists and others to examine the degree to which classrooms support effective communication. The report comprises a review of the evidence base for developing effective communication and an account of the empirical study to develop and determine the technical qualities of the tool.

9. Dockrell, J., Ricketts, J., Palikara, O., Charman, T., & Lindsay, G. (2012). *Profiles of need and provision for children with language impairment and autism spectrum disorders in mainstream schools: A prospective study.* London: DfE.

The prospective study was the most substantial project in the BCRP running throughout the whole period of the research. Focusing on children and young people initially 6-12 years old, we report on the nature of their abilities in language, literacy, behavioural, emotional and social development; the perspectives of the parents; the support provided as examined by classroom observations and specially created questionnaires completed by their teachers and SENCOs.

10. Law, J., Lee, W., Roulstone, S., Wren, Y., Zeng, B., & Lindsay, G. (2012). *"What works": Interventions for children and young people with speech, language and communication needs.* London: DfE.

This report provides a review of 60 interventions for children and young people with SLCN, all evaluated against 10 criteria. The report will form the basis of a web-based resource to be developed by the Communication Trust for easy access by practitioners and parents.

11. Meschi, E., Mickelwright, J., Vignoles, A., & Lindsay, G. (2012). *The transition between categories of special educational needs of pupils with speech, language and communication needs (SLCN) and autism spectrum disorder (ASD) as they progress through the education system.* London: DfE.

Analyses of the School Census and National Pupil Database are used to examine the transition made by pupils with SLCN or ASD over time and by age. We examine factors that are associated with transition between levels of special educational need (School Action, School Action Plus and Statement) and having no special educational need (non-SEN), including having English as an Additional Language and attainment. We also explore school characteristics associated with different transitions to other categories of SEN.

12. Roulstone, S., Coad, J., Ayre, A., Hambley, H., & Lindsay, G. (2012). *The preferred outcomes of children with speech, language and communication needs and their parents.* London: DfE.

This report provides findings from four different studies addressing the perspectives of children and young people with SLCN, and those of their parents. Data are reported from arts-based participating workshops for children, focus groups and a survey for parents; and a systematic review of quality of life measures for children.

13. Roulstone, S., Wren, Y., Bakopoulou, I., Goodlad, S., & Lindsay, G. (2012). *Exploring interventions for children and young people with speech, language and communication needs: A study of practice.* London: DfE.

As a complementary study to our analysis of the evidence for interventions, we also carried out an interview study of speech and language therapy managers and educational psychology service managers, on the basis of which we conducted a national survey of speech and language therapists to examine prevalence of use of the different approaches.

14. Snowling, M. J., Hulme, C., Bailey, A. M., Stothard, S. E., & Lindsay (2011). *Better communication research project: Language and literacy attainment of pupils during early years and through KS2: Does teacher assessment at five provide a valid measure of children's current and future educational attainments? DFE-RR172a.* London: DfE. https://www.education.gov.uk/publications/eOrderingDownload/DFE-RR172a.pdf

We report a study led by Margaret Snowling and Charles Hulme which explored whether teacher assessment and monitoring could be used to identify children with language difficulties in need of early interventions. This study was conducted to inform the Tickell Review of the Early Years Foundation Stage, in particular the proposals for a simplified framework and assessment process.

15. Strand, S., & Lindsay, G. (2012). *Ethnic disproportionality in the identification of speech, language and communication needs (SLCN) and autism spectrum disorders (ASD).* London: DfE.

This report complements that of Meschi et al (number 11). Using School Census data from four years (2005, 2007, 2009 and 2011) the report examines the issue of ethnic disproportionality (i.e. over- and underrepresentation of pupils from different ethnic groups) with respect to SLCN and ASD.

16. Roulstone, S., Hayhow, R., White, P. & Lindsay, G. (2012). *Prospective cohort study of speech and language therapy services for young children who stammer.*

This prospective cohort study follows children referred to speech and language therapy services because of stammering. The study tracks the children's process through the system and their outcomes.

17. Meschi, E., Vignoles, A., & Lindsay, G. (2010). *An investigation of the attainment and achievement of speech, language and communication needs (SLCN).* http://www.warwick.ac.uk/go/bettercommunication

This technical report presents early analyses upon which the study reported in report number 11 is based.

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