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**CITY UNIVERSITY  
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**Language and Socioeconomic Disadvantage:  
From Research to Practice**

**Briefing Paper  
December 2014**

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Professor Shula Chiat, City University London  
Professor Barbara Dodd, City University London

*Q: What is the nature of language problems found in young children from socioeconomically disadvantaged areas? To what extent are they due to limitations in the child's language environment or inherent, biologically based language impairment? Or are both external and internal factors involved? Does it matter what lies behind these early language difficulties? What are the implications for interventions with preschoolers with poor language from low SES groups?*

Children from low socioeconomic (SES) backgrounds are at disproportionate risk of language delay. Previous research has suggested that basic language skills affected in language impairment may not be affected by SES. These skills may therefore help to distinguish children with language impairment from those with poor language due to limitations of their language environment. The distinction is important since children with language impairment require different types of intervention from disadvantaged children whose inherent capacity for language is intact. In this Briefing Paper, we report findings from our research, funded by the Nuffield Foundation, which aimed to tease apart external and internal factors involved in language delay in socioeconomically disadvantaged preschoolers, using measures known to be more or less socially biased.

Our samples comprised 208 preschoolers from Low SES neighbourhoods and 168 from Mid-high SES neighbourhoods aged 3½-5 years, with English as their first language. The youngest age group (3½-4) were followed up 18 months later. An age-matched Clinic sample of 160 children acted as an additional comparison group for the Low SES sample. Our findings reveal the extent to which very basic, early developing language and speech skills may be affected in preschool children from socio-economically disadvantaged neighbourhoods. The outcomes of our study inform interventions and underscore the need for very early intervention prior to school entry. Furthermore, they highlight a need for continuing support throughout the school years if children are to access education effectively.

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## Summary and implications

The increased risk of early language problems for children growing up in socioeconomically disadvantaged families is well documented. Given the key role of oral language in acquiring literacy and accessing the school curriculum, early identification of deficits and appropriate, targeted and timely intervention are crucial. Our study confirmed and added to existing evidence, revealing that increased risk for children in Low SES families extends to fundamental language skills thought to be relatively free of socioeconomic effects. In summary, we found:

- An unexpectedly high proportion of children from Low SES neighbourhoods entered preschool provision without the most basic speech, language and attentional skills expected to be in place at this age.
- A higher than expected proportion had clinically significant language problems, with profiles comparable to children with language impairment in our Clinic sample
- Most of these children with clinically significant problems had not been referred to speech and language therapy (SLT) services.

- In the Low SES sample mother's employment status was more significant than educational qualifications of primary carer for language performance, favouring children whose mothers were employed.
- Children of employed mothers were more likely to be regular attenders at nursery
- Regular attenders had significantly higher scores than poor attenders, with attendance being more significant for language outcomes than mother's employment status.
- The impact of nursery attendance together with evidence of the performance gap narrowing with age indicated that, for some at least, poor performance was due to delay.
- Our findings cast new light on language difficulties in low SES communities and highlight the need for early interventions to address these. They are relevant to policy-makers, to the training and practice of professionals concerned with reducing the SES gap, and to those working with young children and parents in socially disadvantaged areas.

### Policy-makers: implications for support services

Our evidence reveals the need for:

- High quality preschool care
- Extension of provision to two-year-olds
- Support for parents
  - to facilitate children's regular attendance at preschool
  - to find employment
- Prevention through primary intervention by health visitors and professionals working with parents and their babies and toddlers (0-2 years).

### Preschool/early years staff: implications for training and practice

Our evidence makes a case for:

- Training of preschool providers to recognise the presence, nature and significance of language problems and how best to respond and intervene
- Use of our standardised measures for the early identification of the presence and nature of problems; these measures are suitable for administration by staff working in EYFS (3-5 years), including those concerned with the welfare of disadvantaged children, with minimal training.

### Education and clinical services: implications for delivery

Our study reinforces:

- The need for qualified preschool staff
- The potential role of teaching assistants in delivering programmes

Our study raises questions about:

- The best service provision model for joined up working between educational and SLT services to address the scale of the problems we have identified
- The resources needed to implement this model.

## The study: Language difficulties and social disadvantage

### Background

The prevalence and risks of language difficulties in children from socially disadvantaged backgrounds are now well established, as are the consequences for children's literacy development, educational attainment, social and emotional well-being, employment opportunities and life chances. Indeed, a recent government-commissioned review of services for children with speech, language and communication needs (Bercow, 2008) highlighted the scale and seriousness of language difficulties associated with low socioeconomic status, and gave rise to an All Party Parliamentary Group that tackled this specific issue and produced a further report on the links between speech, language and communication needs and social disadvantage (February 2013). But while language difficulties associated with social disadvantage have gained increasing attention and raised increasing concern, the causes and nature of these difficulties remain unclear. As the All Party Parliamentary Group report points out (p.7), they 'may be due to neurodevelopmental problems or other impairments. They may also, however, be due to reduced developmental opportunities limiting the child's learning of language'. If we are to provide effective and optimally timed support for these children's language development, we need to understand the nature and course of their difficulties (see Figure 1). A research study was set up to investigate what underlies poor language performance in socially disadvantaged children, led by Professor Penny Roy together with Professor Shula Chiat and Professor Barbara Dodd at City University London, and funded by the Nuffield Foundation.

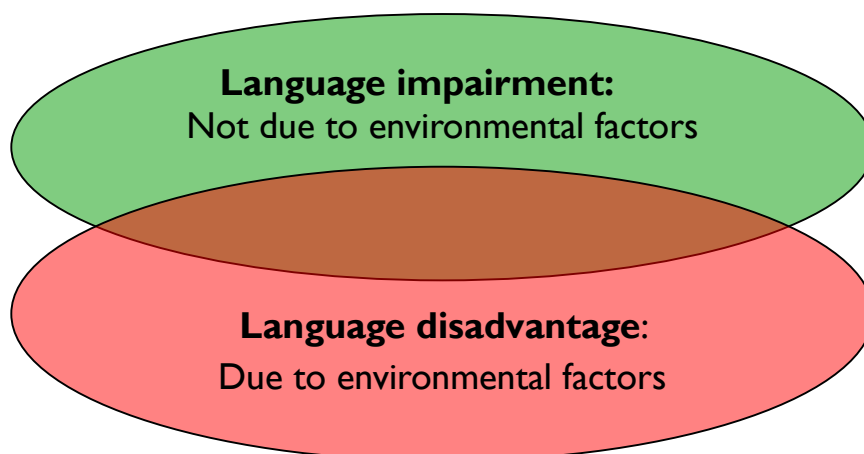


Figure 1. Potential sources of language difficulties in children from socially disadvantaged backgrounds

### Core vs. standard language measures

Previous research has suggested that standard assessments of language used to identify language difficulties are socially biased, because they benefit from experiences of language and language use that are less available to children living with social disadvantage than their more privileged peers. Poor performance on such assessments may therefore be due to limitations in children's language environments and experience rather than inherent impairments in acquiring language. In contrast to standard language assessments, measures of 'core language' target basic language abilities and knowledge which are known to be affected in children with language impairment, but are less dependent on language exposure and experience. Many studies have confirmed that these measures are free or relatively free of socioeconomic effects. Based on these findings, we hypothesised that measures of core language would help to distinguish children with core language impairments from those with limited language due to limited language environments and experience.

*Standard language assessments* test children's receptive and expressive language – their understanding and production of words and sentences. Children can only understand and produce words that they have heard, so vocabulary knowledge is highly dependent on experience. Receptive language is typically tested by asking children to point to pictures that correspond to words or sentences they hear (see Figure 2 for an example). Such a task requires understanding of the sentence, but also careful attention to the sentence and retention of its content, scanning of the pictures which typically differ from each other by a small detail critical for correct picture selection, and matching of word/sentence and picture. These are *metalinguistic* skills which go beyond basic understanding of the sentence, though this is also necessary for successful completion of the task.

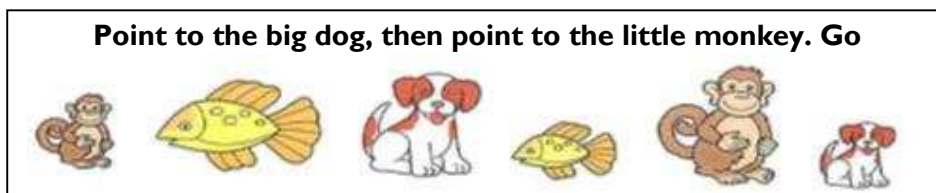


Figure 2. Example from Concepts and Following Directions subtest of the Clinical Evaluation of Language Fundamentals (CELF-2<sup>UK</sup>)

In contrast to standard assessments, *core language assessments* test basic recognition and production of speech patterns, word forms and sentence structures, which require exposure to everyday language but do not rely on rich and varied experience of language use. For example, repeating a word such as *ladder* or *dinosaur* requires children to recognise and produce speech patterns of English to which they have almost certainly been exposed; repeating a nonword such as *daller* or *sinodaur* relies on skills in processing new speech patterns since children have not previously encountered these forms. In learning a new word, for example a new animal name, children rely on the same speech processing skills, but must further link the new word form to a meaning (e.g. the particular type of animal). Going beyond the single word level, a task in which children are asked to repeat a sentence draws on their knowledge of the way words are put together in sentences (morphosyntax) as well as the words themselves and makes demands on children's attention and memory. In the case of simple sentences, children must recognise the key or 'content' words; they must also recognise the order of words and the 'function words' (determiners such as *a*, *the*, *his*, *their*; auxiliary verbs such as *is*, *did*, *don't*, *will*, *must*; and prepositions such as *at*, *from*, *in*, *on*) which indicate grammatical categories and relations in the sentence, as illustrated in the following example:

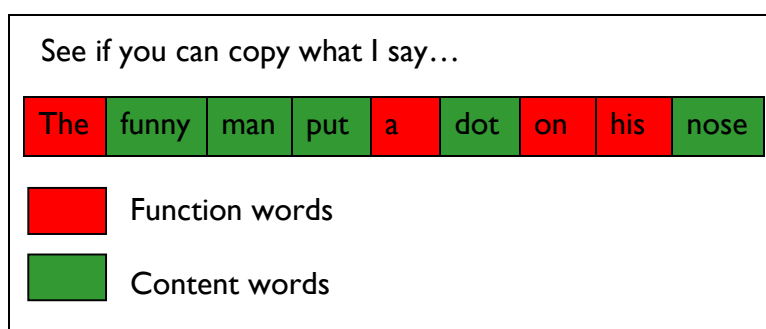


Figure 3. Example of content and function words in Sentence Imitation Test (SIT)

Children with language impairment have difficulty with these basic core language tasks, which have been put forward as potential 'markers' of language impairment. Figure 4 summarises the differences between standard and core language assessments.

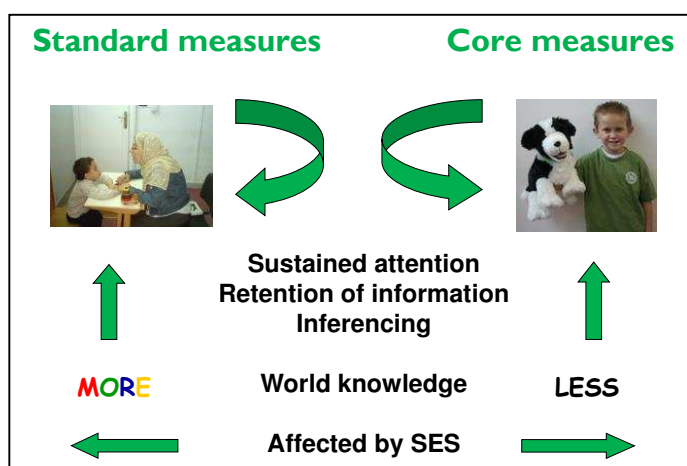


Figure 4. Differences between standard and core language assessments

## Research study

Our research study set out to investigate what underlies poor language performance in socioeconomically disadvantaged children. The main aim was to compare the distribution of performance on standard and core language measures in preschool children living in an area of socioeconomic deprivation (the Low SES sample) and a comparator sample of children from mid-high SES backgrounds (the Mid-high SES sample). Would the Low SES group of children show better performance on core assessments than on standard assessments, which have produced disproportionate levels of poor performance in previous studies of children from low SES backgrounds? This would indicate that some children have intact basic language, despite performing poorly on language tests, and that core language measures might help to distinguish children who have poor language performance due to limited experience from those with language impairment (potentially exacerbated by limited experience). We also investigated relations between low performance and clinical referral to speech and language therapy (SLT) services in both SES samples, and compared performance of the Low SES sample with an age-matched sample of clinically referred children (the Clinic sample) drawn from an existing database (Chiat & Roy, 2008).

In this Briefing Paper, we summarise the results of our study and discuss the implications for the nature of language problems in socially disadvantaged children and the support needed to improve their language skills.

## The Low SES sample

The Low SES sample was recruited from preschool provisions, nurseries and reception classes in Barking and Dagenham, a designated Sure Start area in the UK which at the time of our study was ranked 11<sup>th</sup> most deprived of all English Local Authorities according to the Index of Multiple Deprivation. Children were included if they had English as a first language, no report of congenital problems, hearing loss, oro-motor difficulties, or diagnosis of autism, and nonverbal ability within two standard deviations of the mean (scoring above the lowest 2.3% of the population).

The sample comprised 208 children aged 3;6-4;11 years, of whom almost half were boys. All had English as their first language, and for the vast majority (89%) English was the only language. Table 1 gives a breakdown of the sample by six-month age group and gender. Parental interviews revealed that just under three-quarters were white (72%), just over a third were from single parent families, and mother was the primary care for almost all children (98%). A fifth (20%) of primary carers had stayed in education beyond the age of 16, 14%

had no qualifications, and 6% had degrees/above; two-thirds were not employed and a minority (7%) held managerial or professional posts. Just over a fifth of partners were unemployed with a similar proportion holding managerial/professional posts.

Samples	% Boys	Target n	% 3;6-3;11	% 4;0- 4;5	% 4;6-4;11
<b>Low SES</b>	45.7	208	34.1	32.7	33.2
<b>Mid-high SES</b>	53.6	168	27.4	32.1	40.5

Table 1. Distribution of children in Low SES and Mid-high SES groups according to age and gender

## The Mid-high SES sample

A comparator sample of 168 children was recruited from preschool provisions serving mid-high neighbourhoods in north and south London. All had English as their first language and 83% as their only language. Breakdown by age group and gender is again shown in Table 1. Parental questionnaires available for four-fifths of this sample<sup>1</sup> revealed that four-fifths (82%) were white, a tenth were from single parent families, and mother was the primary carer for all the children. Just over three-quarters of primary carers (76%) had stayed in education beyond the age of 16, less than 1% had no qualifications and nearly three-fifths (59%) had degrees or above; two-fifths were not employed and over a third (37%) held managerial or professional posts. Less than a twentieth (3%) of partners were unemployed and more than four-fifths held managerial/professional posts.

The Low SES and Mid-high SES groups differed markedly on all the major indices of SES. However, group differences favouring the Mid-high SES group in the number of relatives with speech, language or reading problems did not reach significance. Nor were there group differences in the amount of SLT services received (see below), the proportion of children with reported hearing difficulties, or those with additional languages spoken at home.

## Test battery

The test battery was divided between standard and core measures. For full details of the test battery, see Appendix. Standard language measures comprised preschool tests of:

- Expressive language (CELF-2<sup>UK</sup>)
- Receptive language subtests (CELF-2<sup>UK</sup>): Concepts and Following Directions, Sentence Structure, Basic Concepts

A standard measure of nonverbal skills (BAS II) was also administered. Core speech and language measures included tests of:

- Production of speech sounds in words (DEAP)
- Word and nonword repetition (in which allowance is made for errors due to immature speech production) (ERB: PSRep)
- Sentence repetition (ERB: SIT)

<sup>1</sup> We found no differences in the performance of children whose parents did (n=141) and did not (n=27) complete questionnaires.



- Novel word learning (comprehension and production of names of 4 unfamiliar animals, e.g. *capybara*, to which the children received up to four exposures; production was scored for percentage of phonemes correct)

All measures apart from the novel word task were standardised, psychometrically robust tests with UK preschool norms.

Children were tested in nurseries, schools or preschool settings by researchers who were trained speech and language therapists skilled in working with young children. Testing was completed in two to three sessions.

### How did children perform on standard vs. core measures?

Figure 5 shows the mean scores of the two samples on the standard measures (nonverbal, receptive and expressive language) and three core language measures (word/nonword repetition and two measures of sentence repetition). The gap between the groups is striking: while the mean scores of the Low SES sample were consistently below the population mean (100) for verbal and nonverbal measures, the scores of the Mid-high SES comparator group were almost consistently above and differences between groups were statistically significant across the board. Based on previous research, differences on standard language measures were expected. However, the differences observed on core measures were contrary to predictions and contrary to evidence on school-aged children from low SES backgrounds. Word/nonword repetition performance, reported to be intact in older disadvantaged children, was if anything poorer than standard expressive language and sentence repetition performance in the Low SES group.

No gender differences were found on any of the standard or core language measures in either SES group. Girls achieved higher nonverbal scores than boys, but this gender bias applied equally to both SES groups and the difference was not large.



Figure 5. Mean nonverbal, standard and core scores for Low and Mid-high SES groups  
 Key: Nonverbal abilities (BAS-II). Standard language measures (CELF-2<sup>UK</sup>): Receptive language, Expressive language.  
 Core language measures: PSRep - Preschool Repetition Test total score for words and nonwords repeated correctly; SIT total - Sentence Imitation Test total score for number of whole sentences repeated correctly; SIT FW - Sentence Imitation Test total score for number of function words repeated correctly.

For both groups, receptive language scores were lower than expressive, and the lowest in the battery. In order to probe this result further, the three subscales making up the receptive language measure were compared. As can be seen in Figure 6, the subscale Concepts and Following Directions (CFD) was particularly

challenging for the Low SES group, with a mean almost one standard deviation below the population mean (10). As noted above, success on this task draws not only on key linguistic concepts but on a range of nonverbal skills, such as paying attention to detail, integrating visual and verbal material, and holding onto material in working memory. In many respects, the task mirrors the kind of decontextualised language and instructions that typify the language of the classroom and is informative about what might underlie the language problems of the Low SES group.

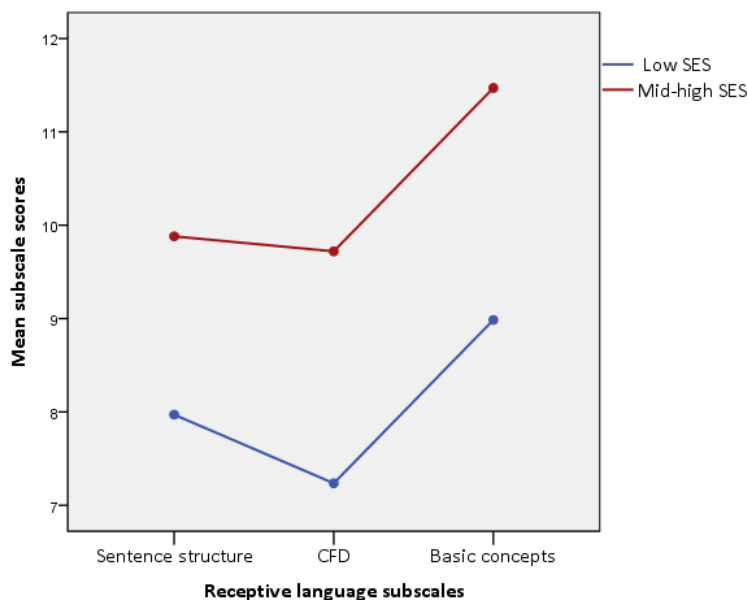


Figure 6. Mean receptive subscale scores for Low and Mid-high SES groups

### What proportion of children performed in the impaired range on standard vs. core measures?

While *mean scores* in the Barking and Dagenham sample were as low on core as on standard language measures, these measures might differ in the *proportion of children with scores in the impaired range*. To investigate this, we took a cut-off of minus 1.5 standard deviations (SDs) below the mean for low performance on each measure, corresponding to the lowest seven percent of the population. This cut-off is indicated by a broken green line in Figure 7, which shows the percentage of children with low nonverbal, standard language and core language scores in the Low and Mid-high SES groups.

Findings on the proportions of low scorers in the two groups largely parallel findings from the comparison of group means. While low scorers were substantially *under-represented* in the Mid-high SES group, low scorers in the Low SES group were substantially *over-represented*. On standard measures, the rate of low scorers in the Low SES group was *six to seven times* higher than in the Mid-high SES group, and *one-and-a-half to four times higher* than we would expect to find in the general population. Nonverbal performance in the Low SES group came closer to the expected level (but it should be borne in mind that children with scores below 70 were excluded from the sample). In line with the pattern of performance observed above, receptive language had the highest proportion of low scorers in both groups.

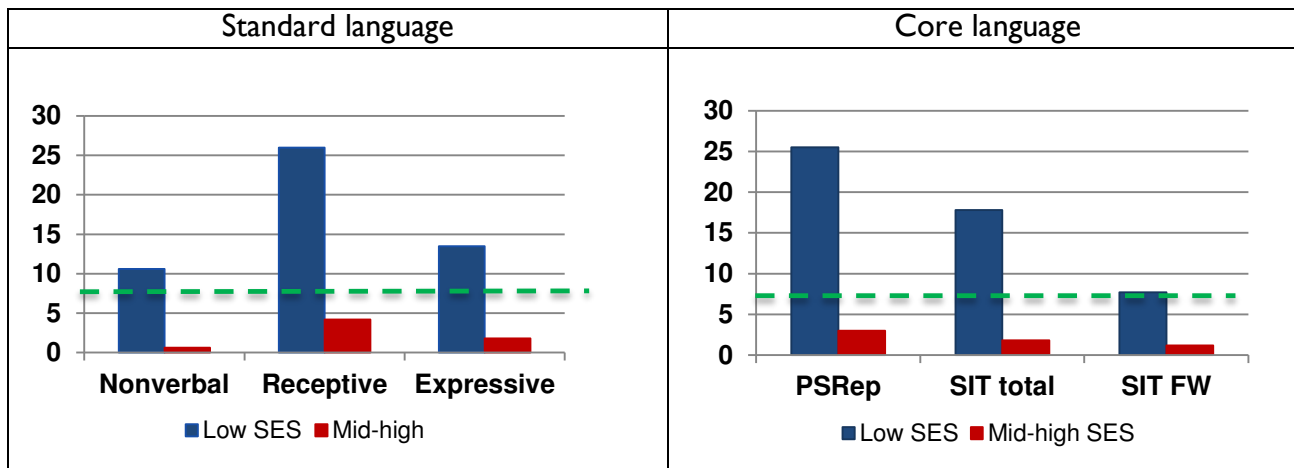


Figure 7. Percentage of low nonverbal, standard language and core language scores for Low and Mid-high SES groups

This accords with other UK studies of young socioeconomically disadvantaged children, but our Low SES group performed somewhat better on the expressive scale than previously reported and we consider why this might be the case below (see ‘Key Findings’). In line with the above observations on mean scores, the proportion of low scorers on the receptive subscale Concepts and Following Directions in the Low SES group was double that found on the other two subscales (22% vs. 11%). In contrast, the proportion of low scorers in the Mid-high SES group on the subscales did not differ (about 4% on all three measures).

Contrary to our predictions again, rates of poor performance on two of the three core language measures were similar to those for standard measures. If anything, the difference between the two SES groups on the PSRep and SIT total sentence recall was even more striking, with proportions of low scorers eight times greater than in the Mid-high SES group. This was mainly because very few children in the Mid-high SES group were low scorers on these repetition tasks (see below). However, there was one exception to this general pattern: on repetition of function words, one of our core language measures, the proportion of low scorers in the Low SES group, whilst still nearly seven times higher than the Mid-high SES group, was close to the proportion in the general population. It should be recalled that difficulties with function words are a hallmark of language impairment.

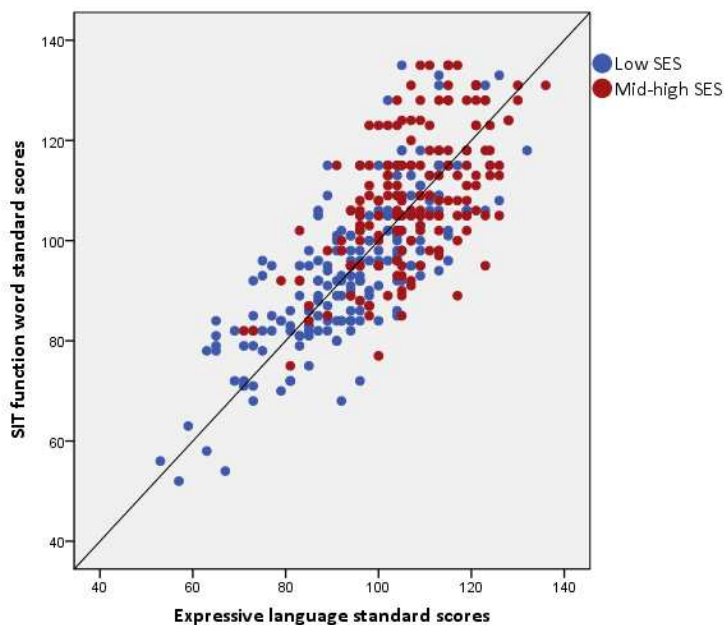


Figure 8. Scattergram showing the relation between performance on core function words and standard expressive scores for Low and Mid-high SES groups

The finding that children in the Low SES sample were not showing disproportionate difficulty with these – in contrast to other measures – is therefore important. Furthermore, although we found significant relations between core and standard language measures in both groups, this was much stronger in the Low SES group and particularly strong between function word and expressive scores (see Figure 8).

Likewise the association between sentence repetition and standard language performance was strong. Of the low scorers on sentence repetition ( $<-1.5SD$ ) in the Low SES group, 80% had receptive and/or expressive problems and the remaining 20% were not problem-free (with standard language scores including Concepts and Following Directions on average about 1 SD below the mean). Furthermore, low scoring on sentence repetition identified 80% of the children in the Low SES group who had combined expressive and receptive problems (see below). In contrast, 84% of children with scores above -1.5 SD did not have low expressive and/or receptive language scores. The sentence repetition test (SIT) is quick and simple to administer and together total sentence scores and function word scores provide useful measures of expressive skills.

### Performance on novel word learning task

The novel word learning task, assessing children's comprehension and production of new animal names after a small number of exposures, was our final core language measure. Exceptionally, performance of the Low and Mid-high SES groups did not differ on the assessment of comprehension, with about two-thirds of the unfamiliar animals identified correctly by both SES groups in a picture pointing task. For both groups, the production task was more challenging but the Low SES group was much less likely to produce the names of novel animals correctly. The oldest age group in the Low SES group (4;6-4;11) achieved about 50% accuracy on the production task, 20% lower than children of the same age in the Mid-high SES group and on a par with children six to nine months younger. Both core and standard measures were moderately related to novel word learning, with the strongest associations found between sentence repetition and function word performance and accurate production.

### What proportion of children had speech production problems?

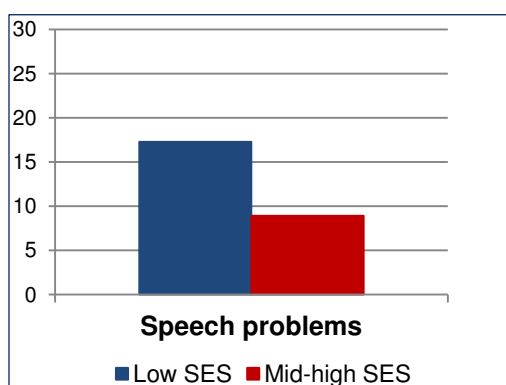


Figure 9. Percentage of speech problems in Low and Mid-high SES groups

Contrary to previous evidence, even speech production (measured by the DEAP) showed disproportionate rates of problems in the Low SES group, with children in this group twice as likely to be identified with problems in the initial speech screen (see Figure 9). Full assessment on the DEAP classifies problems with speech production as phonological delay, phonological disorder, or articulation. This revealed that the unexpected higher rate was for delayed rather than disordered speech, with about four times as many children in the Low SES diagnosed with delayed speech, but similar proportions diagnosed with articulation and phonological disorders (about 3% and 5% respectively).

Researchers carrying out the assessment commented that this might underestimate speech problems as some children's responses to test items were much more intelligible than their spontaneous productions. Teachers in Barking and Dagenham were also conscious of the number of their children with poor speech production and thought this might relate to the extended use of dummies/pacifiers and poor dental health.

Speech production problems, when they occurred on their own and in the absence of deficits in speech sound processing and memory as measured by PSRep, were not a risk for low receptive and expressive language. As can be seen in Figure 10, this was the case for the majority of the speech production problems in the Mid-high SES group, but less than half of those in the Low SES group. Over half the Low SES group with speech problems also had low scores on PSRep. For these children, and for those with poor speech sound processing and memory (low PSRep scores) but no diagnosed speech production disorders, the risk of poor receptive and expressive language performance was increased.

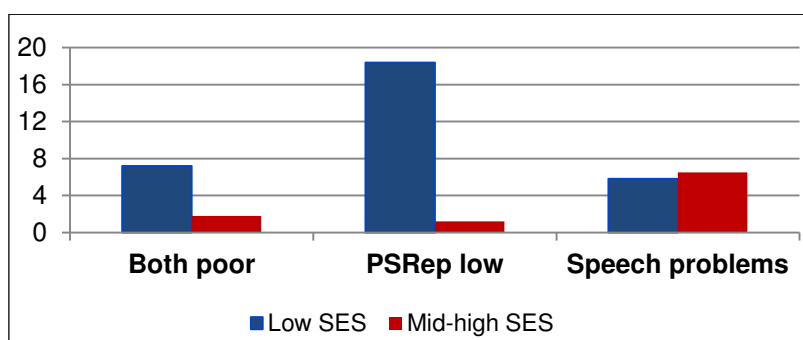


Figure 10. Percentage of diagnosed speech problems and/or low PSRep for Low and Mid-high SES groups

## Does the Low SES profile change with age and school experience?

Given that all but one of our measures of performance are standard scores which take account of age, age-related changes were not expected. However, as can be seen from a breakdown of low performers according to six-month age groups in Figure 11, numbers did reduce with age. This reduction in poor performance reached significance for receptive language, with the most marked drop between the youngest group (3;6-3;11) and the two older groups (4;0-4;11). As noted above, one measure of performance – SIT function word score – was exceptional in showing a close-to-expected rate of low performance for the group as a whole, and this level of performance did not change with age. This is the one measure behaving as we had predicted for core language. In contrast, speech production problems, like PSRep, showed an elevated rate that tended to decrease with age. However, for speech production the trend was less marked and most evident between the two youngest groups and the oldest group: about a fifth of the two younger groups (23%, 21%) compared with about a tenth of the oldest age group (9%) failed the screen.

The reduction in numbers of low standard scores and speech production problems suggests that some children in the Low SES group 'catch up'. Since this 'catch-up' coincided with the start of schooling, it is possible that school experience was responsible for the change. To explore this possibility, we investigated relations between children's performance and the extent of their school experience in terms of their attendance and the point in the year in which they were tested (month of testing).

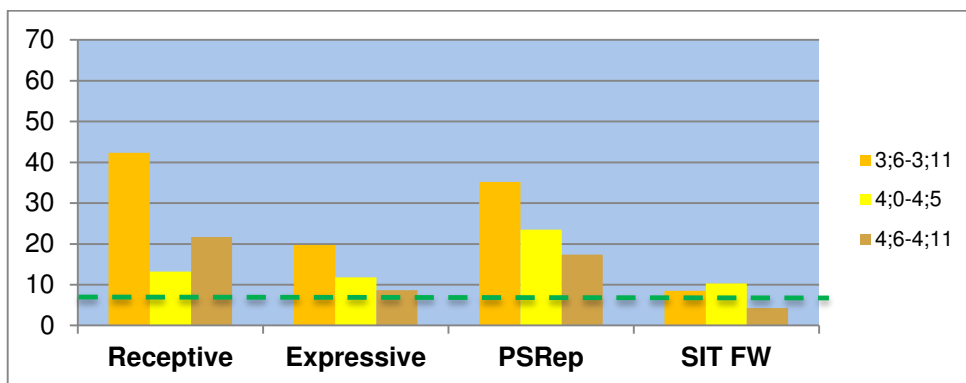


Figure 11. Percentage with low standard and core language scores in Low SES group according to age group

### Relations with school attendance

We had attendance data on a subsample of 187 children from the Low SES group, evenly distributed across the age groups. Children in nursery were much more likely to have low attendance than children in reception classes. As can be seen in Figure 12, there were no low attenders (children with less than 75% attendance) in the oldest age group. The lowest attendance rate for any one child in the three age groups was 32%, 50% and 82% respectively.

Attendance was associated with performance on all measures, nonverbal, standard language and core language, with the exception of PSRep and speech production. This association was largely carried by the relations between performance and attendance in the youngest group. The difference in scores between poor and regular attenders in the youngest age group was about .75 standard deviation. This indicates that children with greater school presence were at less risk than those with limited presence. This raises questions about causal relations between the youngest children’s school attendance and all-round performance: was school input driving the change, or were parents of more able children more likely to bring their children to school?

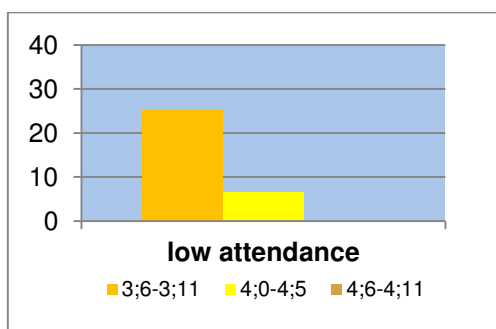


Figure 12. Percentage with low attendance (<75%) in the Low SES group according to age group

### Relations with month of testing

Taking month of assessment rather than attendance as a measure of school exposure yielded very similar associations with performance, but in this case, the associations were significant in the youngest group only and not for the sample as whole, and again with the exception of PSRep and speech production. In contrast, no significant associations were found between performance on any of our standardised measures and the child’s month of birth, taking the sample as a whole or age groups separately.

So we can conclude that, for the youngest children in nurseries and preschool provision, the amount of time spent in the settings, measured by either attendance or point in the school year when they were assessed, was positively associated with standard and core language performance, with the exception of PSRep and speech production. The reduction in low scorers across the age groups in our sample suggests that, for a notable proportion, language development was seriously delayed but not impaired. Where performance was related to school experience, it is possible that school input was a critical factor. In the case of PSRep and speech production, both of which were relatively independent of school experience, changes across age are more plausibly due to late maturation.

However, our findings on changes across the age range are based on cross-sectional comparisons and it is possible that they reflected differences between cohorts rather than age- or school-related changes. In order to explore this further, we followed up the youngest group (3;6-3;11) roughly 18 months later to determine whether we would find catch-up within this cohort matching that observed between the youngest and oldest groups. In addition, we followed up all children who had failed the speech screen, regardless of age, to determine the extent to which speech problems resolved.

### Relations with school experience – follow-up of the youngest age group

At follow-up, 85% of the youngest age group (3;6-3;11) and 89% of children who had failed the speech screen were available. Analyses confirmed that these follow-up groups were unbiased sub-samples of our original sample. Due to resource constraints, the full battery of assessments was not administered at follow-up. The reduced battery included:

Standard language:

- The three CELF subscales (Sentence structure, Word structure and Expressive Vocabulary) that comprise the Core CELF language measure (referred to as Total language, to be distinguished from our measures of core language)
- The CELF subtest Concepts and Following Directions

Core language:

- Word and nonword repetition: PSRep<sup>2</sup>
- Sentence repetition: SIT

Speech:

- Assessment of speech production: DEAP

By the time we saw the youngest children again their mean age was 5 years 2 months (SD 2.3 months, range 4;8-5;8), six months older than the oldest age group in the main study (4;6-4;11), and above the recommended age range for the PSRep. Figure 13 shows the proportion of low scorers on Total-CELF, SIT sentence score and SIT function word (FW) score in our initial three age groups and in the follow-up group. Overall, the follow-up data are in line with our findings from the cross-sectional data. The proportion of children with low Core-CELF in the youngest group had halved at follow-up and was on a par with proportions we had previously observed in the two older groups. It nevertheless remained higher than the proportion expected in the general population, and nearly six times higher than in the Mid-high SES group (less than 2%).

The follow-up group's sentence repetition showed similar gains: the proportion with low SIT sentence scores had also halved and was broadly in line with the proportion in the two older groups overall. As pointed out

<sup>2</sup> PSRep figures are not reported as it turned out children were above the recommended age range

above, SIT function word score was the one measure which did not yield disproportionate numbers of low scorers, and this remained true at follow-up.

The follow-up group included marginally more low scorers across than the oldest group (4;6-4;11) at initial assessment, suggesting that the latter was a slightly stronger group. Overall, the follow-up evidence confirms that (i) the striking gains previously found between nursery-age and reception-age groups reflect true developmental changes in our Low SES sample, and (ii) performance on function words did not vary with age and was the one core measure in line with our predictions.

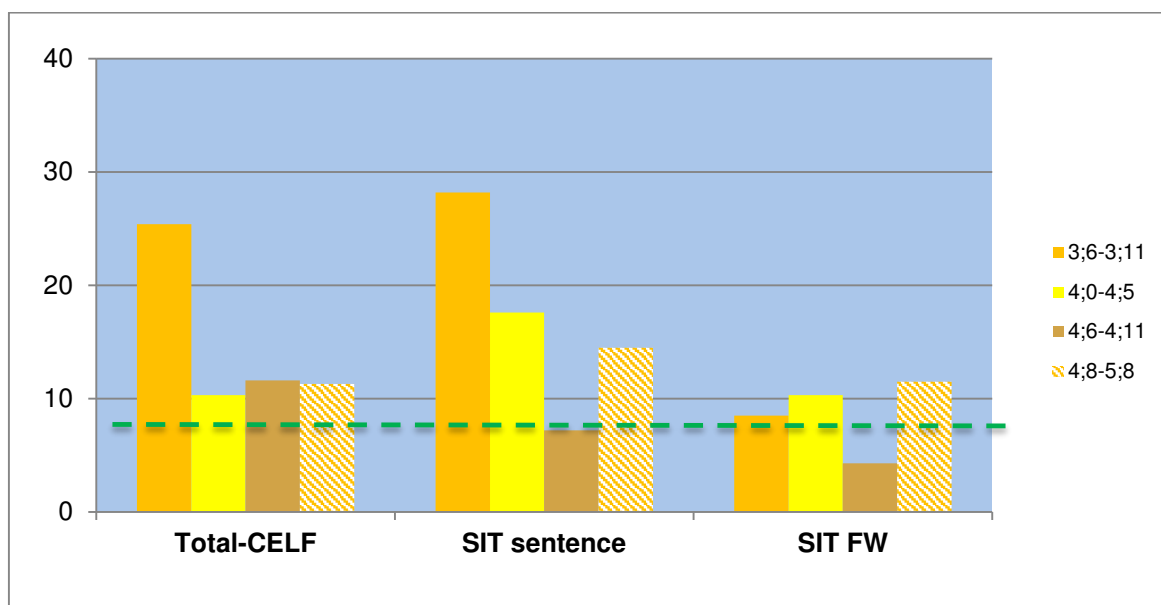


Figure 13. Percentage with low scores on standard and core language in the Low SES group at first testing (all age groups) and follow-up (youngest group only)

Speech production problems had also diminished with age. Over a third of previously diagnosed children were problem-free at follow-up. Children with an earlier diagnosis of delayed phonology were most likely to resolve.

Interestingly, children who were poor attenders in nursery had significantly poorer performance on the standard language measure (Total CELF), compared with regular attenders at follow-up. In contrast, the differences found between poor and regular attenders 18 months earlier on the core language sentence repetition measures were no longer significant.

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### Profiles of performance above the cut-off for low performance

We have highlighted the disproportionate number of children with poor language performance in the Low SES sample. It is important to consider the *full spread* of performance relative to the more advantaged Mid-high SES sample. As can be seen in Figure 14, scores were normally distributed in both groups (with just one outlier in the Low SES group), but the distribution of language scores in the Low SES group was shifted downwards across the board relative to the Mid-high distribution.



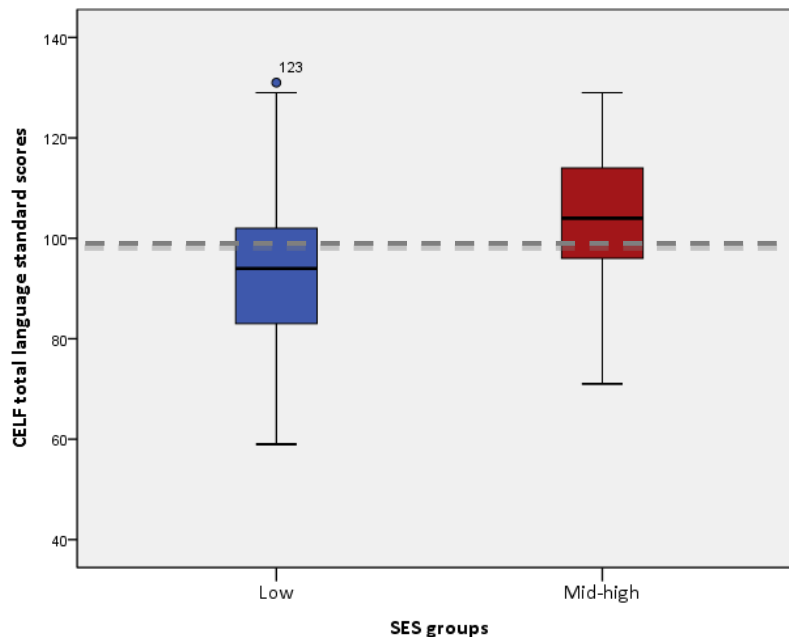


Figure 14. Boxplots showing the distribution of standard language scores in the Low and Mid-high SES groups

Almost a third of the Low SES sample (33%) scored below the average range, compared with less than a tenth (6%) of the Mid-high SES group. The majority of children in the Low SES group had scores below the population mean of 100 (grey dotted line), whereas scores of most children in the Mid-high SES group were above. Although maximum scores in the two groups were similar, high scores were rare in the Low SES group and disproportionately fewer children achieved above-average scores: children in the Low SES group were about five to six times less likely to achieve above-average scores compared with children in the Mid-high SES group, and this did not change with age. Thus, the movement out of the low range we found when children entered reception classes did not impact on the upper end of the distribution. Nevertheless, it is important to bear in mind that the majority of children in the Low SES group fell in the average range.

### Contact with speech and language therapy (SLT) services

Despite the consistently higher levels of poor performance observed in the Low SES group, we found *no group differences* in the amount of contact children had with SLT services: 5% of the Low SES group and 7% of the Mid-high SES group had current contact, with 4% of both groups reporting previous contact. In line with other research, children with speech problems were most likely to be referred, and this was true in both groups. Accordingly, groups differed in amount of clinical contact *relative to their needs*: children with problems in the Low SES group were less likely to be referred to SLT services. As shown in Figure 15, about a third of the Mid-high SES group with speech and/or language problems according to our assessments were receiving SLT compared with about a tenth of those in the Low SES group.

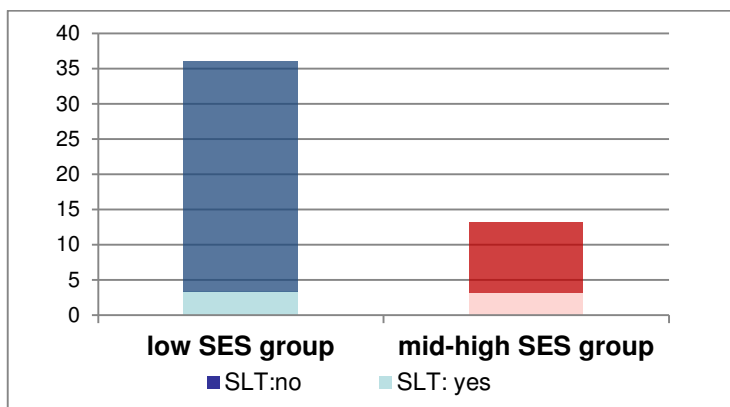


Figure 15. Percentage with speech and/or language problems and current contact with clinical services (pale shading indicates SLT contact)

Interestingly, *all* the children in the Mid-high SES group with current clinical contact had diagnosed speech problems only. Furthermore, over half of this group (compared with none of the Low SES group) currently seeing a SLT had *no* speech or language problems according to the cut-offs we adopted. Language problems, if they occurred on their own, were least likely to come to the attention of SLTs. The majority of children with problems in the Low SES group fell into this category, and only 6% had current SLT contact.

The average number of SLT sessions children received tells a similar story. The maximum number of SLT sessions reported for any one child in both groups was twelve, with the exception of one child in the Mid-high SES group who had received a hundred.

### How do the language problems of the Low SES sample compare with the language problems of a group of clinically referred children?

We have seen that although a significant proportion of the Low SES group had language problems, the majority did not reach the attention of SLT services. There could be a number of reasons for this, but here we explore one possibility – that at a group level their problems differ in kind from children of the same age who are referred to clinical services with concerns about their language and communication development. In order to address this question, we draw on data from another study which looked at predictors of later language problems in a sample of preschoolers referred to SLT services (Chiat & Roy, 2008). For comparison with our Low SES sample, we identified an age-matched sub-sample of the clinically referred group in this study (referred to as the Clinic sample) who also lived in areas of Inner and Outer London and met the same inclusion criteria. Table 2 shows the distribution of children in the Clinic sample across the three six-month age bands. As might be expected, a higher proportion of the Clinic sample were boys. The distribution of income groups was even across this sample: about a third of the sample were from low (<20K), a third from middle (30K-40K) and a third from high income families (>40K).

Samples	% Boys	n	% 3;6-3;11	% 4;0-4;5	% 4;6-4;11
<b>Low SES</b>	45.7	208	34.1	32.7	33.2
<b>Clinic</b>	75	160	36.3	31.9	31.9

Table 2. Distribution of children in Low SES and Clinic groups according to age and gender

Figure 16 shows mean scores on all measures for which we had comparable data in the Low SES and Clinic groups. As can be seen, the nonverbal and receptive language performance of the two groups looks remarkably similar. However, the expressive and repetition skills of the Clinic sample were substantially poorer than those of the Low SES group.

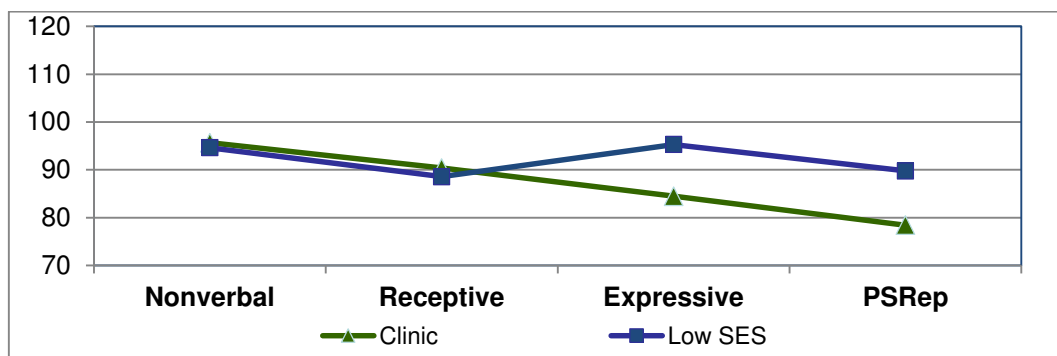


Figure 16. Mean nonverbal, standard language and core language (PSRep) scores for Low SES group and Clinic group

Likewise, looking at distributions of performance in the two groups, the proportion of low scorers was similar for nonverbal and receptive measures, but on the expressive measure, the proportion of low scorers in the Clinic sample was almost three times higher than in the Low SES sample (see Figure 17).

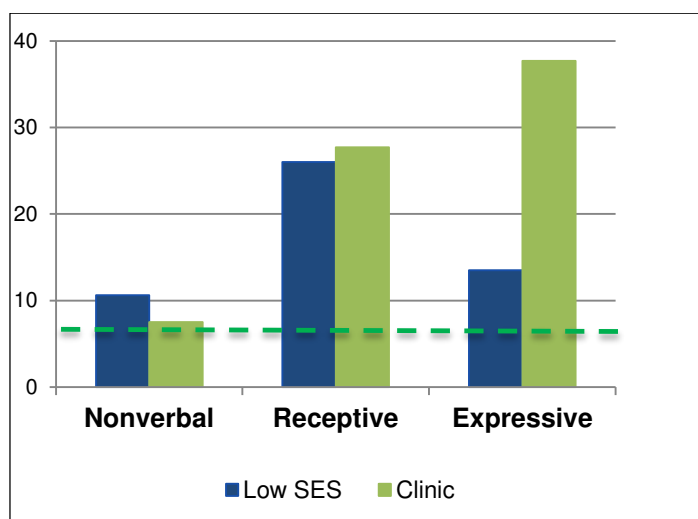


Figure 17. Percentage of low scorers in Low SES and Clinic groups

In line with the high rate of receptive problems in the Low SES group, half the children with problems in this group had low scores for receptive language but expressive language scores in the normal range (see Figure 18). However, further examination revealed that the mean of expressive scores for children with low receptive scores was low average in *all* groups, and it was exceptionally rare (one child in our Clinic sample) for children to achieve a discrepant expressive score that was more than one standard deviation above their low receptive score. None of these expressive scores were in the above-average range. In contrast to the Low SES group, the vast majority of children with problems in our Clinic sample (86%) had low scores in expressive language, or receptive and expressive language (see figure 18).

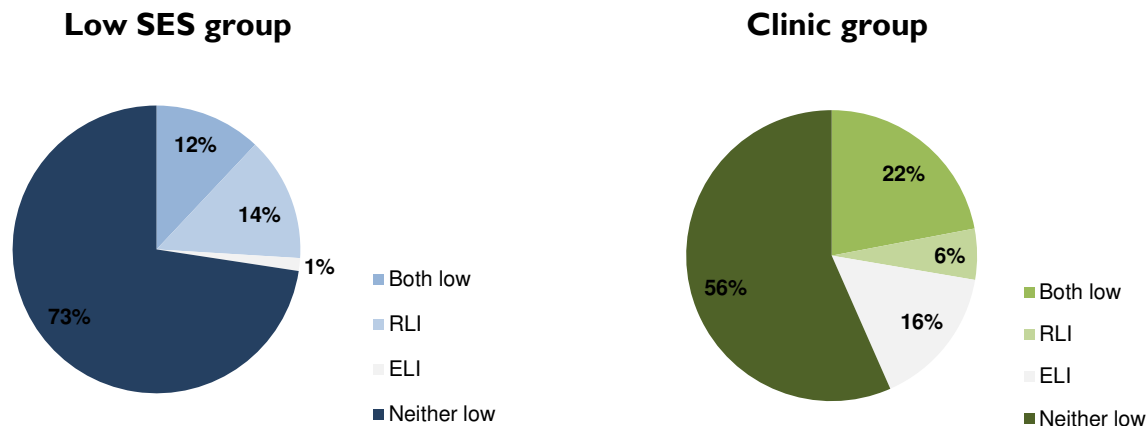


Figure 18. Combined, receptive only and expressive only language problems in the Low SES and Clinic samples

Furthermore, while the rate of poor receptive language performance reduced across the three age groups in the Low SES sample (see above), there was no change across age groups in the Clinic sample (see Figure 19). These differences in profile and pattern of change with age suggest that the difficulties underlying poor receptive language may differ between the two groups (see Key Findings below).<sup>3</sup>

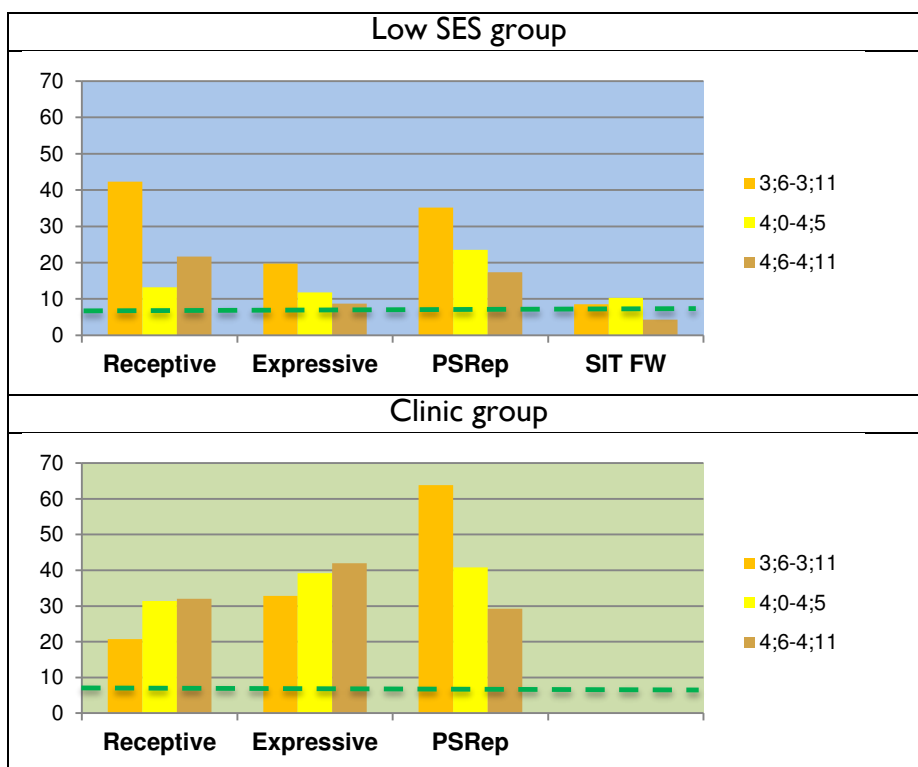


Figure 19. Percentage with low standard and core language scores according to age group in the Low SES and Clinic groups

The one core measure for which we had comparable data in our Low SES and Clinic samples, the PSRep, revealed similar group differences. Although rates of poor performance were well above the expected level in both groups, this was more extreme in the Clinic sample: almost half the Clinic sample had low scores, compared with a quarter of the Low SES group (see Figure 20).

<sup>3</sup> NB Differences in measures may be a contributory factor (The Pre-School Language Scales were used in the Clinic sample)

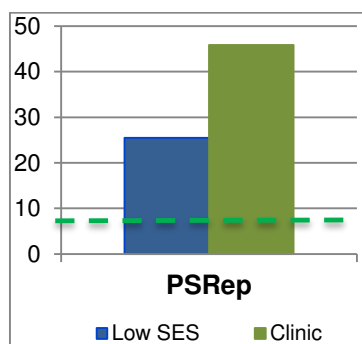


Figure 20. Percentage with low PSRep in Low SES and Clinic groups

## SES factors

We observed large differences between SES groups in primary carers' educational qualifications and employment status. Differences in children's standard and core language performance were also large. The associations between educational qualifications and standard language measures were small but significant in both groups, whereas the relations between educational qualifications and core language measures reached significance in the Low SES group only. Employment status of the primary carer in the Low SES group was significantly associated with performance on *all* language measures in the Low SES group, but this was not the case in the Mid-high SES group. Taking children of the 70 primary carers (mainly mothers) in the Low SES group who were employed, less than 3% had low scores on expressive language and sentence repetition measures, compared with 20-25% of children of unemployed carers or those seeking employment, with differences of about .75 standard deviation favouring those in employment. The slight trend for children of employed primary carers to be older (30%, 29% and 41% across the three age groups) was not significant and the reasons why children's language might be related to their mothers' employment status are likely to be complex. But the significant associations we found between employment status and children's school attendance, favouring those in employment (particularly in the youngest age group), support the pivotal role education plays in children's language development and life chances.

## Family backgrounds: language and literacy problems

A somewhat higher percentage of family members and close relatives were reported to have speech and language problems and literacy problems in the Low SES group compared with the Mid-high SES group (speech and language: 20% vs. 12%, and literacy: 27% vs. 19% respectively). The association between SES groups and family problems with speech and language was of borderline significance. Family speech and language problems were associated with low scores on two core language measures (PSRep and function words) and speech production (screen failures) in the Low SES group only. Reading problems in family members and close relatives were associated with expressive language and sentence and function word repetition in the Low SES group only, and PSRep in the Mid-high SES group. Whilst these results are broadly in line with existing evidence, they need to be treated with some caution. The numbers of low scoring children in the Mid-high SES group on either standard or core language measures were exceptionally low. Furthermore, given the number of comparisons involved, some of these significant results may have occurred by chance.

## Key findings

A number of key findings emerged from the study:

- a) Our study is the first to evaluate core language skills (e.g. repeating 1-3 syllable items, learning new words, and repeating simple sentences) previously found to be relatively free of SES effects in children from different SES neighbourhoods. The results are disturbing: contrary to expectations, performance of the Low SES group on all our core measures was low and all but one showed a disproportionate number of children scoring in the impaired range. The only measure that was less vulnerable involved elements of language that occur with very high frequency in everyday language. The scale of their difficulties with all other basic language tasks demonstrates the fundamental challenges many of these children face when they start school, whether their problems arise from limited development due to disadvantage or from language disorder, and the extent of their needs. However, for most children in our Mid-high SES sample, these core language tasks were effortless.
- b) The Low SES group were at increased risk of clinically significant language disorders, affecting about 11-12% of the sample. This was evident in their combined receptive and expressive language problems. The risk was about 7-12 times greater than in the Mid-high SES group, 1½ times the level expected in the general population, and about half the rate of children referred to clinical services. Very few of these children had contact with speech and language therapy (SLT) services.
- c) Receptive problems on their own were common, with an additional 14% having low scores. Overall the rate of receptive problems with or without co-occurring expressive problems was high and in line with prior evidence. However, significant discrepancy between low receptive and expressive scores was extremely rare. Tasks involving attention to detail, working memory, response inhibition, and planning and integrating material were particularly affected in the Low SES group. These skills (sometimes referred to in relation to language as higher order language skills) are crucial for accessing the decontextualized language of the classroom and accessing the curriculum successfully. These 'hidden difficulties' relate to poor reading comprehension and are the least likely to be recognised and come to the attention of clinical and educational services. However, they play a significant role in the negative long term sequelae associated with early speech, language and communication needs.
- d) Expressive problems without co-occurring receptive problems were rare in our Low SES sample, in contrast to the Clinic sample. The rate of receptive problems we found was in line with an earlier UK study of a similar aged Low SES group but in the latter study, expressive language was equally impaired. There are a number of possible reasons for these disparate findings including, for example, sampling differences (see below for impact of SES factors on expressive performance); cohort differences; changes in educational practice and nursery provision in the last ten years; and the high quality of preschool provision in Barking and Dagenham, where language enhancement in the early years is prioritised.
- e) Speech production problems and speech disorders were more prevalent in the Low SES group: delayed speech production was unexpectedly high, particularly in the youngest age groups; in addition, the spontaneous speech production of many children who fell short of a clinical diagnosis was considered to be poor. Speech production problems were not directly related to language problems. In line with previous evidence, speech production problems were most likely to come to the attention of clinical services.
- f) Very basic skills of speech and language processing, planning and memory were associated with standard language performance, and this association was stronger in the Low SES group. Poor performance on these core language measures (particularly sentence repetition) was highly associated

with poor standard language performance (particularly weak expressive skills). Contrary to expectations and evidence from school-aged children, these skills, seen in their repetition of words, nonwords and whole sentences, were significantly delayed in our Low SES sample. Low scorers were substantially overrepresented in the Low SES group and substantially underrepresented in the Mid-high SES group. Performance on very basic skills was not independent of SES. Performance in the Low SES group improved with age but remained lower than expected, with about twice the rate of low scorers found in the general population and 4-7 times more than the Mid-high SES group.

- g) The proportion of low scorers on a measure of function words did not show age-related changes and was closest to normative expectation. This measure is important because it relates to children's knowledge of basic morphosyntax and is considered to be a hallmark of specific language impairment (SLI), affecting a small but significant subsample of children with language impairment. Four important points arise from this finding. First, in line with other research in Low SES groups, basic morphosyntactic skills appear to be relatively intact and not subject to delay. Second, the risk of low scores was still higher than the general population (about 9-10% affected) and substantially greater than in the Mid-high SES group (just over 1% with low scores). Third, this measure (together with sentence repetition) was highly related to expressive language in the Low SES group. Fourth, the language problems of children identified as low scorers on receptive and/or expressive language measures but who score in the *average* range on the repetition of function words are unlikely to be due to impaired basic morphosyntactic skills.
- h) The relatively poor novel word learning of the Low SES group, although not predicted, is not unexpected given the delay we found in their early speech sound processing skills which are known to play a key role in early language and vocabulary acquisition. The capacity of the Low SES group to produce novel words was at the level of more advantaged children six to nine months younger. These results, in line with other research, underscore the legacy and longer-term implications of delayed processing skills.
- i) Education emerged as a more important direct than indirect factor for children's core and standard language skills in the Low SES group. Two measures of school factors, attendance and amount of schooling, were significant in the Low SES group, particularly for the youngest age group in nurseries. Regular attenders at nursery had standard and core language scores about .75 standard deviation higher than poor attenders. A similar sized advantage was found for children with mothers in employment compared with those either unemployed or seeking employment. Furthermore, employment status was related to the attendance rate of preschool children: mothers in employment were more likely to get their children to nursery on a regular basis. Importantly, the advantage of regular nursery attendance was maintained for standard language performance 18 months later
- j) The rates of familial language and literacy problems were somewhat higher in the Low SES group, and related to some core and standard language measures. However, given the exceptionally low incidence of low scorers in the Mid-high SES group, any conclusions drawn need to be tentative.
- k) It should be noted that ours were neighbourhood samples. Although the differences in key SES factors between the two groups were large, there was also within group variability which was particularly significant for language outcomes in our Low SES group. On the one hand it is important to bear in mind that the majority of the Low SES sample had scores in the average range. On the other hand, those with above average scores were underrepresented. Furthermore, our sample excluded 5% of recruited children with nonverbal skills less than 2SDs below the mean, two thirds of whom had poor language. This range of skills and the downwards shift of the distribution, compared with the upward shift of the Mid-high SES group, will impact on the quality of peer conversations and the language of classrooms. We have also shown that children in the Low SES group were disadvantaged in their capacity to access the kind of decontextualized language they meet at school. The Matthew principle

works at all levels, benefitting children who are more advantaged and prejudicing the chances of those who are less well placed.

- l) The rate of contact with SLT services in the two SES groups was very similar. Given the large gulf in performance, this demonstrates that provision to address speech and language needs was not equitable. Speech problems in both groups were most likely to come to the attention of services. In contrast, few children in the Low SES group with combined expressive and receptive problems had current or past contact with SLT services.
- m) The incidence of low scores on core and standard language measures in the Mid-high SES group was strikingly low, and well below expected rates. This suggests that for our Mid-high SES group, early language experiences had acted as a protective factor for language skills.
- n) Although not measured systematically, our researchers commented on the eagerness and willingness of our Low SES sample to participate in the assessment sessions. No child refused to co-operate and many asked if they could be seen again. Children were proud of their stickers but more significant was the amount of individual attention and recognition these sessions afforded them. Arguably this 'window of opportunity' for professionals involved in the care and education of young children to respond appropriately to their needs will not stay open, or at least be as accessible, later on in their school careers.

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## Language impairment and language disadvantage: are they separable?

Our findings argue against any simple separation of problems due to disadvantage and those due to language disorder. Children with inherently weak language processing skills will be affected by limited environmental input and support, and are therefore more likely to score in the impaired range than children with similar processing skills but strong input and support. Nevertheless, we have identified some profiles of performance in the Low SES group that are indicative of disadvantage and others more akin to language impairment.

Just over a seventh of the sample (14%) had an unusual profile of difficulty, with low scores for receptive language but expressive language above our  $-1.5$  SD cut-off (and 76% within the average range). Since we expect difficulties with receptive language to impact on expressive language, as is usual in children diagnosed with language impairment and as found in the Clinic sample, this profile points to marked problems with the receptive language *tasks* rather than with basic language skills. One of our starting points was the observation that standard measures of comprehension require metalinguistic skills that go beyond basic language understanding (particularly in the case of the CELF Concepts and Following Directions task), skills that are better developed in children from more advantaged backgrounds. Two additional findings support the inference that poor receptive performance is due to these challenges rather than difficulties with basic language:

- Receptive language performance in this sample was age related, in contrast to the Clinic sample. Strikingly, in the youngest age group, the rate of low scores in the Low SES group was *double* that of the Clinic sample. However, in the 4;0-4;11 age groups, the difference between samples reversed, with the Clinic sample having a higher rate than the Low SES sample. This suggests that a proportion of poor early performance was due to *delay* rather than disorder in the required skills, with the observed 'catch-up' likely reflecting the positive effects of school input and experience.
- On our core measure of morphosyntax, repetition of function words in sentences, the majority of these children had scores above our low cut-off, and over half scored within the average range. Since problems



with function words are a strong indicator of language impairment, their adequate performance on this measure suggests key language processing skills are unimpaired.

In contrast to function word scores, we observed high rates of poor word and nonword repetition, difficulties learning new words, and high rates of immature speech production, pointing to disproportionate delay almost across the board. Given that these core measures have proved free of SES effects in previous studies, we infer that children's language environments were severely limited, impacting on almost all aspects of early language development at the preschool stage.

But why was function word repetition an exception? The implication is that the input children have received by this age is sufficient to acquire high-frequency items that remain challenging for children with impaired language processing abilities, but this issue clearly requires further investigation. Nevertheless, about a tenth of the Low SES sample (9-10%) had low scores on function word repetition, a measure that is indicative of language impairment. Supporting the inference that these children had fundamental difficulties with language, the majority had low scores on all other measures, differing by 1SD or more from those with function words above the cut-off.

## Appendix: Test battery

<b>Standard language measures</b>	
Expressive and receptive language	Clinical Evaluation of Language Fundamentals Preschool-2 <sup>nd</sup> edition UK (CELF-2 <sup>UK</sup> )
Phonological awareness	Preschool and Primary Inventory of Phonological Awareness (PIPA)
Nonverbal skills	British Abilities Scales II (BAS II): Block design and picture similarity subtests
<b>Core language measures</b>	
Articulation and phonology	Diagnostic Evaluation of Articulation and Phonology (DEAP)
Phonological processing and memory	Early Repetition Battery (ERB): Word and nonword repetition (PSRep)
Expressive morphosyntax	Early Repetition Battery (ERB): Sentence repetition (SIT)
Word learning	Production and comprehension of new words

## References/Further Reading

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