

## **R/000/22/2940 Shyness, communicative competence, and vocabulary acquisition**

### **Full Report of Research Activities and Results**

#### **Background**

The question addressed in this empirical investigation is the influence of shyness upon children's performance on assessments of vocabulary development, specifically whether their performance is influenced by the form of administration of the test. Previous research has shown that children who are identified as shy, reticent or withdrawn tend to perform more poorly than their more sociable peers on these tests but there has been no examination of factors contributing to these individual differences. This study examines two hypotheses about their performance and incorporates controls missing from previous research.

*Shyness and verbal communication.* Recent research has established that shyness is an important dimension of individual differences among infants, older children and adults, whether it is construed as a category of temperament or as a personality trait (Crozier, 1995). Measures of shyness have proved reliable and show substantial long-term stability (Kerr, 2000). Differences between shy and non-shy children have been reported in observed behaviour and on a range of psychophysiological data but the most pervasive differences have been identified on measures of verbal communication, more specifically the frequency and timing of speech acts. Reticence, a long latency to make spontaneous comments and reluctance to contribute to conversations are characteristic of children who are identified as shy. This pattern has been identified in the classroom, using quantitative and qualitative analyses of children's spontaneous contributions, answers to teacher questions, interactions with peers, and frequency of on-task verbal behaviour (Evans, 1987, 1993; Crozier, in press).

*Assessments of vocabulary.* Differences between shy (or reticent) children and non-shy or more talkative children are not restricted to naturally occurring social situations in the classroom or elsewhere but are also found on formal tests of language development. A review of research by Evans (1993) concluded that children within the age range 3 to 11 years who have been identified as shy or reticent perform more poorly than their peers on formal language assessments, including standardized tests of vocabulary. The trend is for shy or reticent children to perform more poorly on tests of language production but the differences are less marked on tests of language reception and there are inconsistent findings on tests of receptive vocabulary. Evans (1996) administered examples of both types of test to the same sample of children and found differences in the test of expressive but not receptive vocabulary. Studies reviewed by Crozier (in press) have shown that differences are reliably found when measures of oral fluency are involved, including mean length of utterance and total word output in spontaneous speech and indices of the ability to generate rhymes, alliterations and the names of people and objects.

One problem with this research is that it has incorporated a diversity of constructs (e.g., shyness, reticence, withdrawn behaviour, social apprehension) so that it is difficult to compare studies and resolve inconsistencies in findings. A further problem is that several key studies compare groups that are at opposing poles of the dimension of interest, for example, the most reticent and least reticent, or isolated and sociable children. It is not clear whether obtained differences are due to sociable children having above average vocabulary performance or shy children having below average performance. Existing research suggests that sociable children tend to score above age norms rather than shy children scoring below norms. Finally, many studies

have utilised small sample sizes and samples of mixed age groups. Age has not been treated as a factor in the design of experiments so that it is not known if the effects are greater at one age than another. There are plausible reasons for expecting age differences. Shyness takes different forms at different ages (Crozier, 1999) and older shy children may be more likely to engage in solitary pursuits like reading that could increase their vocabulary.

*Explanations of performance differences.* Evans (1993) argued that reticent children have less competence in expressive and pragmatic domains of language development. She suggests that this is because their reticence has produced fewer opportunities for social interaction and impeded the development of communicative skills. It is possible that reticence, in turn, is linked to characteristics of the shy person's home that are less conducive to the development of vocabulary, for example, less social stimulation, less conversation, or a smaller social network of friends and acquaintances. This explanation can be characterised as the communicative competence hypothesis. An alternative explanation, which can be labelled the anxiety-performance hypothesis, draws upon the dominant theoretical approach to shyness, which regards it as a form of social anxiety, with the implication that verbal behaviour is inhibited by anxiety. There is extensive evidence that shyness is more likely in certain kinds of settings. It is more likely in situations that are interpreted by the individual as evaluative or ego-threatening. It is also elicited in novel settings and in interactions with strangers, unfamiliar people or authority figures. Cognitive tests administered by researchers would seem to meet criteria for settings likely to elicit shyness. The prediction can be derived from this hypothesis that performance will be influenced by test administration conditions that make social-evaluative factors salient. No research has tested this prediction directly although Broberg et al (1997) have argued that their findings imply that shyness affects verbal but not written responses to test items.

## **Objectives**

The overall aim of the project is to investigate the cognitive-competence and anxiety-performance interpretations of individual differences in children's performance on formal tests of vocabulary. In pursuit of this aim, the study submits the following hypotheses to empirical test:

1. That the scores on vocabulary tests of shy children will be influenced by the conditions of test administration;
2. That differences between shy and less shy children will be specific to the test of vocabulary and will not be found on a test of mental arithmetic;
3. That differences between shy children and their peers will be influenced by the age of the children.

The study incorporates the two following design features missing from previous research. First, teachers nominating shy children will also provide ratings of the children on an established shyness checklist measure and also on items assessing reticence as used in the research by Evans (1993). This will help ensure that different teachers are selecting children on a common basis. It is also intended to overcome one of the limitations of earlier research that it is difficult to compare different studies on their definitions of terms. It facilitates comparison of findings with previous research. Second, the comparison group will not be selected by teachers for sociability or absence of shyness but will be selected arbitrarily (name adjacent on the register) from the same class as the shy children. This removes the ambiguity whether

differences in shyness are due to inferior performance of shy children or the superior performance of sociable children.

*Justification for hypotheses.* The communicative competence hypothesis proposes that differences on test scores reflect stable underlying differences in verbal competence and implies that test performance should be relatively constant across different conditions of testing. Furthermore, differences between shy and less shy children should be specific to assessments of language development, especially expressive vocabulary, than to other cognitive tests where expressive vocabulary plays a much smaller role. The anxiety-performance hypothesis implies that performance will be influenced by test administration conditions that make salient factors predisposing to shyness. In addition, this hypothesis implies that conditions evoking social anxiety will not be specific to vocabulary but will also affect performance on other measures of cognitive ability.

The study involves the administration of a test of vocabulary and a test of another cognitive ability (mental arithmetic) to samples of shy and less shy children under different administration conditions. The basic comparison is between individual face-to-face administration and testing in a group setting within the classroom where the child is not singled out for attention but is tested alongside his or her peers. The study also involved a second individual face-to-face condition that varies the condition of administration for vocabulary and arithmetic. In light of the conjecture of Broberg et al (1997), that differences between the shy and the less shy would be found in oral but not written responses, a second face-to-face condition invited participants to provide written responses to the vocabulary test items. Pilot study of the mental arithmetic test (see below) suggested that memory considerations would influence performance in the face-to-face condition (but not the group condition, where questions were available on the page); children in this condition were given the items on printed card as well as spoken.

*Changes in objectives from proposal.* The objectives of the study remain the same, as do the overall design and the proposed sample size. One of these conditions diverges from that described in the original proposal where a computer-presented condition was suggested. This change was made for four reasons. First, our literature search identified the plausible prediction made by Broberg et al (1997) that differences in vocabulary performance between shy and non-shy children would be evident in oral but not written responses. Since this is the only prediction about the influence of test conditions that we have been able to trace in the literature it was decided to incorporate it in the design. Second, its inclusion would remove a potential confound between the face-to-face condition (where the response was oral) and group condition (involving a written response). Third, we noted in the pilot study that children in face-to-face testing had difficulty remembering the questions in the mental arithmetic task so this condition introduced a memory aid. It was not possible to add a fourth condition to the experiment; it is difficult to negotiate access to schools under their current time pressures and this study already involved a substantial number of schools. Finally, our preliminary interactions with head teachers raised two concerns about the computer condition. First, some were sceptical about its ecological validity, since there were no plans to introduce computer testing of children. Second, there were considerable differences among schools in pupils' experience with computers in the classroom, introducing an additional source of variation. A final change from the original proposal involved omitting the test of non-word repetition memory. This

decision was based on criticism of this element of the study by one of the ESRC anonymous referees of the original proposal.

## **Method**

### *Participants*

The participants comprised 320 children from 29 Primary Schools, 80 Reception pupils (mean age = 4 years 9 months) and 240 Year 5 pupils (mean age = 10 years 1 month). Of this sample 158 were male and 162 were female; 158 were nominated as shy and 162 were assigned to the comparison group. Shy and non-shy children were selected on the basis of teacher ratings. Teachers were asked to consider the class as a whole and to nominate two boys and two girls whom they regarded as most shy. They were provided with a definition of shyness and the shyness items of the EAS (see below). The comparison group was formed by identifying, for each shy child nominated, the pupil in the same class of the same gender nearest in the register who had not been nominated. Following the selection of participants, the teacher rated the eight children on a set of nine items, five from the Teacher Ratings Form of the EAS Temperament Survey (Boer and Westenberg, 1994) and four reticence items from the study of vocabulary test performance reported by Evans (1996).

### *Materials*

*Reception cohort.* Test sessions involved completion of two standardized assessments of expressive vocabulary and a test of mental arithmetic. Each child was assessed using the Expressive One-Word Picture Vocabulary Test – Revised (EOWPVT-R). Administration and scoring of the test followed the procedures set out in the test manual, and raw and standard scores for each child were calculated. The Crichton Vocabulary Scale (1988 Revision) was also administered and scored following procedures set out in the test manual. This standardized test is a measure of production as children are presented with a series of words and asked to explain in their own words the meaning of each word in turn. A 10-item Mental Arithmetic test was constructed using infant classroom materials. The items were derived following analysis of teaching material for this age and discussion with classroom teachers. A version of the test was administered in a pilot study carried out in two schools and submitted to item analysis before a final version of the test was adopted. Teachers and children involved in the development of the test did not participate in the main study.

*Year 5 cohort.* The children completed the Crichton Vocabulary Scale (1988 Revision). Administration in one face-to-face Condition followed the same procedure as the younger cohort. Variations in the administration in the other two conditions are described in the procedure section below. Children were also presented with a 15-item Mental Arithmetic test. A pool of items was formed, drawing upon the format of items in a standardized intelligence scale, inspection of teaching materials appropriate for this age group, and discussions with teachers. As with the younger cohort, a pilot study and item analysis was carried out in two schools, and a final set of items was selected.

### *Procedure*

Permission was obtained from headteachers for the researcher to visit their school and test a selection of pupils. An accompanying letter explained the aims and objectives of

the study. A letter was sent to either the Reception or Year 5 teacher seeking their participation and explaining the procedure for nominating the eight pupils from their class. Consent forms were sent out to the parents of potential participants.

#### *Reception Cohort*

Having scheduled the school visits, the process of data collection commenced in February 2000 with the first cohort of participants (Reception; 4-5 year-olds). Upon entering each school, the research assistant was presented with a list of eight participating children but was unaware as to which four had been nominated as belonging to the shy group. Each test was conducted individually, on a face – to – face basis, and responses were given orally. The order of tests alternated with each participant. Upon completion of testing the selected children, the class teachers disclosed which were the shy children and gave the researcher the completed rating scales.

#### *Year 5 Cohort*

The second phase of the data collection process involved the cohort of Year 5 participants (age 9 – 10 year-olds). Consistent with the preparation for cohort 1, Year 5 teachers listed the eight children but did not indicate those identified as shy until after the final test had been administered. Three variations of the administration of tests were involved. In Condition 1 the tests were administered individually, face – to – face, and responses were made orally. Condition 2 also involved individual face – to – face administration, but participants made their responses in writing. Each arithmetic question was presented on card to reduce memory load. In Condition 3, participants completed the tests in a group setting, and the tests were administered to the entire class. The order of administration of the two tests alternated with each individual or, in the third condition, each class.

After all data had been collected schools were asked to provide information about Year 5 pupils' scores on NFER standardized tests of language and arithmetic reasoning that had been administered routinely during the course of the school year. For the reception children, base level assessments were available.

## **Results**

*Test scoring.* Scores on the vocabulary and arithmetic measures were screened for approximation to normal distribution and any outlier values. Steps were taken to assess the validity of this test by correlating scores with the children's scores on the NFER tests. Scores were available for 182 children (arithmetic reasoning) and 178 children (language). The Arithmetic scale constructed for this study correlated significantly with the NFER Mathematics test scores ( $r = 0.69$ ,  $P < .001$ ). This is comparable with the magnitude of the correlation between the Crichton test and the standardized language test (NFER Progress in English;  $r = 0.63$ ,  $P < .001$ ).

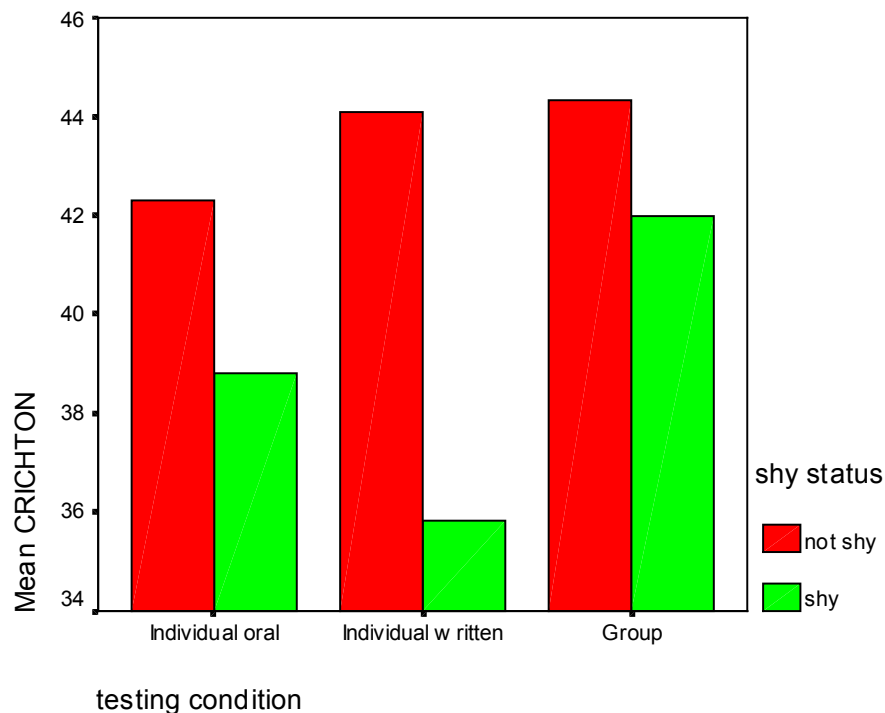
*Shyness ratings.* Scores on the items on the shyness and reticence checklists completed by teachers for the participating children were submitted to principal components analysis. One factor was extracted meeting the criterion of eigenvalues greater than unity, explaining 61 per cent of the variance. A reliability analysis was carried out on the nine items and the obtained value of Cronbach's Alpha coefficient proved satisfactory ( $\text{Alpha} = 0.92$ ). The nine items seem to be measuring a common factor and to produce an internally consistent scale. Scores on the items were summed to produce a total shyness rating score for each participant. It is essential to check that

the shyness scores are comparable across conditions and classes, and that the children nominated as shy obtain higher scores on the checklist than children arbitrarily chosen for the comparison group. Analysis of variance confirmed that shyness ratings were comparable across class teachers and conditions, and that children nominated as shy obtained significantly higher ratings than the arbitrarily selected comparison group.

### *Tests of hypotheses*

(1) Influence of conditions upon performance. This hypothesis was tested for Year 5 children by means of analysis of variance. The MANOVA model allowed for the fact that children are assigned at random to condition by class, rather than individually, and that children are also 'yoked together' by gender, since shy boys and girls and comparison boys and girls are assigned from each class to any one condition. The analysis tested for effects of shyness and the three variations of test administration. There were significant effects of shyness on Crichton Vocabulary scores in the two face-to-face conditions, but not in the group administration condition (see Figure 1 for a graphical depiction of mean scores). Scores on the Arithmetic test were submitted to a parallel analysis of variance, but there were no significant effects of shyness in any of the conditions.

Figure 1: Mean Crichton vocabulary scores by shyness and condition



The pattern of findings reported here provides support for the hypothesis that the conditions of testing have an influence on the performance of shy children on tests of vocabulary. Overall, shy children obtained lower scores than their peers on the Crichton test, but inspection of the data for each condition shows that the differences were smaller (and statistically non-significant) in the group test condition than in the two individual face-to-face conditions. The performance of the less shy participants remained relatively stable across conditions, but the relative performance of shy participants was best in the group condition and poorest in the face-to-face written condition. The finding that significant differences between shy and less shy children are obtained in both face-to-face conditions does not support the hypothesis that shy children would perform better when the required response was written rather than spoken. It is not possible from these data to explain this finding; it implies that writing under the eyes of the tester might have been at least as stressful as uttering the answer.

Results support the hypothesis derived from the anxiety-performance account and imply that shy children are more comfortable when they are tested among their peers than when they are singled out for individual attention. A sense of being the focus of attention is an important factor in eliciting shyness, a recurrent finding in research. Of course, less shy children may also be more comfortable in the more anonymous group condition, but the results suggest that shy children's performance is more influenced by the form of administration of the test.

The results show too that there is some support for the vocabulary competence hypothesis in that, overall, there was a statistically significant effect for the Crichton vocabulary measure but not for the mental arithmetic test. A possible explanation of this finding is that the mental arithmetic test may not have sufficiently sound psychometric properties to discriminate among participants. Against this, it can be argued that the test did discriminate in that there was an approximately normal distribution of scores. In addition, scores on this test correlated substantially with those obtained on the NFER Mathematics test administered on a separate occasion as well as with other measures of ability, namely the Crichton test and NFER Progress in English test. Indeed, the overall trend is for shy children to obtain lower scores on the arithmetic measure ( $r = -0.23$ ,  $N = 240$ ,  $P < .001$ ).

A further explanation is that the effect on arithmetic may be weaker than the effect on vocabulary, perhaps because this test makes fewer demands on preparing an appropriate verbal response. A between-subjects design might not have been sufficiently powerful to detect small differences between conditions on the measure of arithmetic. A considerable amount of the variation in both vocabulary and arithmetic test scores can be explained by variation among classrooms and this is a more important determinant of performance than individual differences in shyness. There were practical reasons for the decision not to adopt a within-subjects design. It would have been very demanding for the same individuals to undertake a larger set of cognitive tests. Schools would not have been willing to allow us to take children out of their classroom routine activities for the considerably longer time necessary. There is also an ecological argument. Pupils are normally tested either individually or in groups, not in arrangements designed to provide powerful tests of hypotheses. If shyness does have practical significance for schools then individual differences ought to be robust enough to be found across different arrangements of administration. This is the case for the vocabulary measure included in this study.

The tendency across the data set as a whole is for shy children to perform more poorly than their peers. In the 9-10 year group, shyness ratings correlate significantly ( $P < .001$  in all cases) with Crichton vocabulary ( $r = -.26$ ), mental arithmetic ( $-.23$ ), standardized language ( $-.32$ ), and standardized arithmetic ( $.34$ ). If

one restricts attention to the comparison sample, which presumably has a random sample of shyness scores apart from missing those extremely shy children nominated by teachers, the same pattern emerges (shyness ratings correlate with Crichton vocabulary:  $-.35$ ; mental arithmetic  $-.34$ ; standardized language,  $-.43$ ; standardized arithmetic,  $-.36$ ; all  $P < .001$ ). The reasons for this trend are worthy of further study.

This study makes further contributions to the literature. It shows that differences in vocabulary performance reported for reticent and socially isolated children can be found for children rated on a shyness temperament measure. Second, shy children perform less effectively than their peers; vocabulary differences are not simply due to more talkative or sociable children being more fluent than average.

## (2) Age, shyness and performance.

Scores obtained by the Reception cohort on the EOWPVT, Crichton scale, and mental arithmetic test were submitted to analyses of variance, one for each measure, with class and shyness as independent variables in each case. The effect of class was statistically significant in each case, but the effect of shyness within class did not approach the conventional significance level. This remained the case when the analyses were repeated with age (in months) as a covariate, on the assumption that small differences in age might be important for this cohort. Children of this age had not been given standardized tests in school. Ordinal data were available on baseline assessments of language and number development, but chi-square analysis failed to reveal any differences between shy and less shy children in the distribution of these assessments.

It is not clear why there was little effect of shyness upon the performance of the younger sample. Significant results have been obtained on one of the tests (EOWPVT-R) with reticent children aged 6 years (Evans, 1996), although the contrast in that study was between reticent and 'verbal' rather than 'average' children. There is evidence (Crozier, 1999) to imply that social-evaluative anxiety becomes more prominent as a factor in shyness after approximately five years of age and this might provide one explanation for the larger effect of shyness among the older children as well as for the tendency for shy children to perform less well when tested individually. Age changes in self-concept and comparison of self with peers might also be relevant. However, this is an issue that needs to be addressed by further research.

## **Conclusions**

Findings about individual differences on assessments of vocabulary and the status of the communicative competence hypothesis have theoretical and practical significance. From a theoretical perspective they demonstrate the impact of temperament upon language development. They imply an interaction between temperament, social experience, and language performance that would make an important contribution to the literature on child development and language acquisition. They are potentially of considerable educational significance, particularly in the context of recent changes in educational policy concerning the assessment of children, where assessments of language development have been extended into primary school education and are used for making decisions about children and judgments about the quality of their teaching. It is important to establish if there is a source of individual differences that affects children's scores and is not being

recognised by their schools. Although effect sizes are small (as estimated from the correlation coefficients) differences can nevertheless have practical significance

This study has been successful in meeting its objective of testing alternative explanations of shyness differences in tests of vocabulary. Testing 320 children in 29 different schools was a major undertaking. There is a small but consistent trend for shy children to perform less well than their peers. The performance of shy children on a measure of vocabulary is influenced by the means of assessment, with shy children performing less well than their peers in a face-to-face individual test but comparable to them when tested as part of a group, whether in the condition of this experiment or in routine classroom standardized testing.

## Activities

The following conference papers have been presented:

Crozier, W. R. & Hostettler, K. Shyness and children's performance on tests of vocabulary development. Poster presented at ESRC/Regard Conference, 'Future Social Science Research: Support, Strategy and Direction', September 2000, University of Bristol.

Crozier, W. R. & Hostettler, K. (2000). Shyness and children's test performance. Paper presented at British Educational Research Association Annual Conference, September 2000, Cardiff University.

The following public seminar has been presented:

Crozier, W. R. Shyness, reticence and children's vocabulary development, Learning Capital Programme, Cardiff University, July 2000.

The following are to be presented:

Crozier, W.R. & Hosteller, K. Shy schoolchildren's performance on tests of vocabulary. Poster presentation at British Psychological Society Centenary Conference, Glasgow, March 2001 [this paper has been selected by the Society for the issue of a press release].

Crozier, W.R. & Hostettler, K. Shyness and children's vocabulary. Paper in Schmidt, L. (convenor), Symposium, 'Childhood Shyness: Perspectives on Development, Learning, Attention, and Psychopathology', Society for Research in Child Development, Biennial Meeting, Minneapolis, April 2001.

It is intended to submit a paper to the 2001 Annual Conference of the British Psychological Society Education Section Conference.

## Outputs

Crozier, W. R. (in press). Shyness, self-perception and reticence, in R.J. Riding & S.Rayner (Eds), New Developments in Self-Perception, New York: Ablex.

Crozier, W. R. & Hostettler, K. Shyness, communicative competence, and vocabulary acquisition. In preparation for submission to major refereed journal.

## Impacts

The grant holder is preparing a brief account of the research findings to be disseminated to the schools that participated in the project. In addition, following discussion with participating head teachers about the aims and objectives of the project, he is preparing a booklet on the impact of shyness in the classroom, including the assessment of children and guidelines on helping shy pupils to reach their potential. This publication will be in non-technical language aimed at teachers, advisory teachers and student teachers.

## Future Research Priorities

The priority is to gain insight into the psychological processes that influence the performance of shy children in test conditions. This requires a closer examination of behaviour in the test situation, including recording verbal and non-verbal responses such as measures of latency and hesitation in responses. These may be important indicators that shy children set higher criteria for making a response when they are uncertain about the answer, to avoid the embarrassment of making a mistake.

A second priority is to examine age differences in test performance. Given the variability in children's test scores in the age group a within-subjects design might be a more sensitive measure for this purpose. It is also important to observe samples of shy and less shy children of different ages in the classroom to examine their social interaction and pragmatic use of language in classroom activities. This behaviour provides the basis for teachers' ratings of shyness. Furthermore, patterns of behaviour may be predictive of performance on formal tests.

## Annex: References

Boer, F. and Westenberg, P. M. (1994). The factor structure of the Buss and Plomin EAS temperament survey (parental ratings) in a Dutch sample of elementary school children, Journal of Personality Assessment, 62, 537-551.

Broberg, A. G., Wessels, H., Lamb, M. E., and Hwang, C. P. (1997). Effects of day care on the development of cognitive abilities in 8-year-olds: A longitudinal study, Developmental Psychology, 33, 62-69.

Crozier, W. R. (1995). Shyness and self-esteem in middle childhood, British Journal of Educational Psychology, 65, 85-95.

Crozier, W. R. (1999). Individual differences in childhood shyness, in L. Schmidt & J. Chaulkin (Eds) Extreme Fear and Shyness: Origins, Neuroendocrine Mechanisms, and Clinical Outcomes. New York: Oxford University Press, 14-29.

Crozier, W. R. (in press). Shyness, self-perception and reticence, in R.J. Riding & S.Rayner (Eds), New Developments in Self-Perception, New York: Ablex.

Evans, M. A. (1987). Discourse characteristics of reticent children, Applied Psycholinguistics, 8, 171-184.

Evans, M. A. (1993). Communicative competence as a dimension of shyness, in: Rubin, K. H. and Asendorpf, J. (Eds), Social Withdrawal, Inhibition and Shyness in Childhood, Hillsdale, NJ: Erlbaum, pp. 189-212.

Evans, M. A. (1996). Reticent primary grade children and their more talkative peers: verbal, nonverbal, and self-concept characteristics, Journal of Educational Psychology, 88, 739-749.

Kerr, M. (2000). Childhood and adolescent shyness in long-term perspective: Does it matter? in W.R. Crozier (Ed.), Shyness: Development, Consolidation, and Change. London: Routledge, pp. 64-87.

## **R/000/22/2940 Shyness, communicative competence, and vocabulary acquisition**

### **Summary of Research Results**

The award was applied to reviewing the literature and undertaking an empirical investigation into the influence of shyness upon children's performance on assessments of vocabulary development, specifically the effect of the form of the administration of tests on performance. Prior research has shown that children who are identified as shy, reticent or withdrawn tend to perform more poorly than their more sociable peers on these tests but there has been no examination of factors contributing to these individual differences. This study was successful in testing hypotheses about their performance, incorporating controls missing from the design of prior research. The literature review is 'in press', to be published in 2001.

There is evidence that differences between shy or reticent children and non-shy or more talkative children are not restricted to naturally occurring social situations but are also found on formal tests of language development. Shy or reticent children within the age range 3 to 11 years perform more poorly than their peers on formal language assessments, notably standardized tests of expressive vocabulary. This has been interpreted by some psychologists in terms of the relative lack of competence of shy children in the expressive and pragmatic domains of language. An alternative explanation draws upon the dominant theoretical approach to shyness, which regards it as a form of social anxiety, with the implication that children's verbal behaviour is inhibited by anxiety. There is extensive evidence that shyness is more likely in novel and evaluative or ego-threatening situations and cognitive tests administered by researchers would seem to meet criteria for settings likely to elicit shyness. The aim of this research was to vary the conditions of testing in an attempt to manipulate the salience of evaluation. It also investigated whether effects on performance were specific to vocabulary or would also be found on a test of mental arithmetic.

Twenty-nine primary schools from three counties in South Wales participated in the project. Two samples of children were tested, 80 Reception children aged 4 to 5 years and 240 Year 5 children, aged 9 to 10 years. All the Reception children were administered tests of expressive vocabulary and mental arithmetic in individual, face-to-face testing sessions, and oral responses were required to the test items. One group of Year 5 children was tested in equivalent conditions, but two variations were introduced. A second group made written responses in individual sessions; a third group completed the tests in written booklets alongside the other children in the classroom. Teachers identified shy children in their class and a comparison sample was formed from children adjacent in the class register. Because of potential differences in the interpretation of shyness by the large numbers of teachers involved teachers were provided with a standard definition and also completed a shyness checklist for all the participating children.

The principal hypothesis of the study was supported, in that the conditions of test administration did influence the vocabulary test performance of shy children. They performed more poorly than their peers in the two face-to-face conditions but not in the group test condition. Additional data on pupils' standardised test scores previously collected under group testing conditions by the schools also showed no significant

difference between shy and less shy children. There were no significant differences between shy and less shy children in the reception sample.

This is the first study to identify and compare different explanations of shy children's relatively poor test performance on tests of vocabulary. In addition, it extends findings of research carried out with reticent and withdrawn children to children who are identified as shy. It shows that differences in vocabulary test performance between reticent and talkative children are not simply due to the verbal precocity of the most talkative children, an interpretation that cannot be ruled out for other studies. It involves a larger sample of children than in previous research, and it took steps to rectify some weaknesses in the design of earlier studies.

The overall pattern of the findings, of no difference in performance among the 4–5 year-olds and in the group test of the 9-10 year-olds, considered together with differences among the older children in the two face-to-face conditions, is compatible with a longstanding theory of the development of shyness. Whereas novel situations can elicit shyness at any age, shyness becomes closely associated with concerns about being evaluated by others after about five years. This account provides an explanation of the results of this study if it is assumed that face-to-face testing is more likely to trigger evaluation concerns. This issue needs further research. It is also important to examine more closely the processes involved in the poorer performance of shy children in test conditions. It is plausible that reluctance to respond because of possible embarrassment at getting the answer wrong is an important factor but there is no direct evidence of this.

The findings have theoretical and practical significance. The study contributes to the literature on the temperament of shyness by showing that differences in behaviour in social interactions between shy and less shy children are also found in formal, 'scripted' social situations. A cognitive test provides a highly structured social situation with a clear role for the child to play and requires less assertiveness and social skill than most routine interaction, yet the influence of shyness is evident. The study contributes to the literature in educational psychology, specifically research into psychological factors that influence children's school achievement, by showing that there are small but consistent differences in test performance between shy children and their peers. Underachievement is usually associated with difficult or disruptive pupils, but it can characterise shy, withdrawn children as well.

The study has shown that conditions of test administration do affect the test performance of shy children, and implies that individual face-to-face testing can provide an underestimation of the child's abilities. This has practical significance for teachers and other professionals when assessing children. Future research should consider how teachers could help shy pupils overcome their inhibition in these situations and help them realise their potential.

**ESRC Award no. R 000 22 2940**

**Title: Shyness, communicative competence, and vocabulary acquisition**

ESRC Data Archive

SPPS file: crozier data archive.sav

Variable	Variable description	Labels	Missing value code
school	ID of school		None missing
class	ID of classroom		None missing
shy_sta	Shyness status	1 = not shy 2 = shy	None missing
cond	Experimental condition	1 = young cohort 2 = individual oral 3 = individual written 4 = group	None missing
age-grou	Age group	1 = 4-5 year-olds 2 = 9-10 year-olds	None missing
age	Age in months		None missing
sex	Sex of child	1 = male 2 = female	None missing
eowpvt_r	Vocabulary scores EOWPVT		999
eowstan	Standard scores EOWPVT		999
crichton	Crichton vocabulary scores		999
marith	Mental arithmetic scores		999
ma_perc	Mental arithmetic scores as percentage		999
Rating1 through rating 9	Scores on nine shyness checklist items	Paraphrase of item	None missing
shytot	Sum of 9 shyness checklist items		None missing
basema	Baseline number scores, class test		999
bamgroup	Baseline number class test, categories	1 = below average 2 = above average 3 = top	999
basevoc	Baseline oracy scores, class test		999
bavgroup	Baseline oracy class test, categories	1 = above average 2 = top	999

maclass	Arithmetic class test type	1= NFER Maths 2= Cognitive Abilities test 3= QCA (Qualifications and Curriculum Authority)	999
mrawsor	Arithmetic class test raw score		999
mstascor	Arithmetic class test standard score		999
voclass	Vocabulary class test, type	1= NFER 2=Cognitive Abilities Test level B 3=Primary Reading test, Level 2 4= Suffolk Reading Scale 5=QCA	999
vrawscor	Vocabulary class test raw score		999
vstascor	Vocabulary class test standard score		999