modulations vocales de la mère sont atténuées dans la deuxième situation mais que ceci n'est vrai qu'avec les enfants les plus jeunes. Cette atténuation permet aux enfant de mieux se concentrer sur la tâche mais réduit leur accès au contenu des messages émis par la mère. La discussion concerne les conséquences à tirer de ces constats dans la mise en oeuvre des programmes d'intervention.

Key words: Intervention programmes, Joint attention, Language acquisition, Prosody.

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Current theme of research:

Early language development; Children with special needs.

Most relevant publications in the field of Psychology of Education:

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Current theme of research:

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Communication skills, educational achievement and biographic characteristics of children with moderate learning difficulties

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This paper examines aspects of intellectual, linguistic and academic abilities of 71 children with moderate learning difficulties. A profile of these abilities is presented and analysed. The profile provides a rationale for mounting a long-term intervention study designed to develop these children's communication abilities. It also provides us with a baseline model against which the effects of the intervention can be assessed. In addition, the profile explores the relationships between several aspects of academic achievement and biographical factors such as age, gender, season of birth and IQ. Statistical analysis reveals significant relationships between several of the variables investigated. The implications of this analysis for educational practice are considered.

Introduction

The aim of the research reported in this paper is to explore the relations between communication skill and academic achievement in children with moderate to severe learning difficulties being educated in two special schools. This profile of abilities constitutes the initial stage of a long-term study designed to assess the effects of school-based interventions using structured communication activities on the learning skills and academic achievement of this population of children. Before turning to the profile of abilities in any detail, the theoretical frame-

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work driving the research will be outlined. General characteristics of this population of children will then be discussed, with the aim of providing a rationale for the selection of variables for inclusion in the profile.

Self-regulation and communication

Vygotsky's writings are now so widely known and influential in developmental psychology as to require little by way of introduction here. The central role portrayed by the theory for social interaction and communication in the transmission of culture and the formation of the "higher mental processes" such as reasoning, memorising, problem solving, planning and self-evaluation has attracted attention and stimulated research in a variety of fields. These include investigations of parent-child interaction (for example, Wertsch & Stone, 1979), peer interaction (for example, Forman, 1987; Tudge & Rogoff, 1989), methods of instruction (for example, Brown, Palinscar, & Armbruster, 1986), and moral reasoning (Kruger, 1992). Here, we begin by reviewing the evidence which is most relevant to those aspects of the approach that motivated the research reported.

Brown, Ferrara, Campione and their colleagues have been extending and exploiting Vygotskian thinking in developing educational programmes designed to improve literary and academic achievements of children who experience difficulty in learning at school (for example, Brown et al., 1986; Brown & Ferrara, 1985). Vygotsky (1978) argued that when children co-operate with others in collaborative activity, especially with someone more mature and knowledgeable than themselves, they not only acquire knowledge and skills specific to the activity in question, but also learn how to regulate their own future learning. Through such interactions, children discover how to regulate, plan, monitor and evaluate their own physical and cognitive activities and are able to exploit such abilities in other situations.

Brown and her colleagues hypothesise that some children's difficulties in learning stem from the fact that self-regulatory or meta-cognitive activities like planning and monitoring are typically implicit within the social context of learning situations. By making them explicit, bringing them into focus on the "social plane", such children can be helped to acquire self-regulatory skills and thus improve their subsequent learning.

Using a method termed "reciprocal teaching", Brown and colleagues have produced evidence for long-term gains in children's reading comprehension skills. Reciprocal teaching is a procedure whereby children are made explicitly aware of strategies implicated in expert reading for comprehension. The teacher models mature comprehension-fostering and comprehension-monitoring activities, making them overt and audible. Through guided practice in applying these usually implicit strategies, such self-regulatory behaviour gradually becomes an automatic part of the child's own reading process.

Using this method, Brown and Ferrara (1985) have demonstrated that the significant improvements made in pupils' reading comprehension scores are maintained a year after intervention. In a later study the researchers took over responsibility for a social studies programme lasting a complete academic year and applied the same technique. Gains were made not only in children's performance on standardised measures of reading, writing and subject knowledge, but also in the "quality of the thinking process" as demonstrated by the nature of their discussions and writing (Brown & Campione, 1990).

Shayer and Adey (1993; Adey & Shayer, 1993) also attribute the positive effects in Science, Maths and English following a two year intervention programme to the metacognitive skills which the children developed through the course of this programme.

Self-regulatory skills also play a part in the development of communication. Successful transfer of information is dependent upon an understanding of particular strategies and conventions of language use coupled with an ability to regulate one's use of these in order to produce comprehensible and coherent messages. Monitoring the effects of an effort after communication by observing and interpreting the actions and reactions of a partner in interaction provides essential feedback about the possible sources of confusion, ambiguity and misunderstanding engendered by the act of communication. The consequence, saying too much too

quickly, for example, or saying too little to avoid ambiguity, provides opportunities for insights not only into the perspectives of others and their informational needs, but also into the limitations of human cognition. Similarly, being on the receiving end of inadequate or ambiguous help and instruction may provide a basis for insights into how information has to be structured and paced in order to be comprehensible.

Gillian Brown and her colleagues (Brown, Anderson, Shillcock, & Yule, 1984), though not, explicitly influenced by Vygotskian theory, have explored similar ideas. Working with adolescents in Scotland, they have investigated the effects of extended experience in structured peer interaction activities on the development of communication skills. They draw a distinction between "chat", and "information-giving talk", claiming that the latter requires the use of specific skills which are not necessarily employed in the course of everyday talk. In a series of studies, these researchers demonstrated that many children approaching the end of their secondary education still have difficulty in accurately transferring information. Brown et al. (1984) argue that it is not the case that these children are deficient in a particular aspect of spoken language but rather that they have difficulty in knowing how and when to deploy their language in order to be most effective as communicators. By providing children with a range of tasks which offered opportunities for them to use information-giving speech in a variety of situations they were able to demonstrate that children made considerable progress over a relatively short period of time. These improvements in children's communication were shown to last over time and were transferable to different tasks.

Such studies add weight to Vygotskian theory by demonstrating that the manipulation of aspects of social interaction and communication to provide experiences which, according to the theory, should result in changes in self-regulated learning, do in fact result in significant gains as predicted.

Evidence of another kind comes from a different field of research; investigations into the impact of verbalisation on problem solving performance. Several studies (for example, Chi, Bassok, Lewis, Reimann, & Glaser, 1989; Fergusson-Hessler & de Jong, 1990) involving comparisons of effective and less effective problem solvers (for example, in solving physics problems) have demonstrated that efficient and accurate problem solving performances can be distinguished from less effective efforts by analyses of the content of concurrent verbalisation (i.e., of solicited commentaries made by problem solvers about their own, ongoing, attempts at solution). The "self-explanation effect" refers to a number of differences in the characteristic talk which accompanies good and poor performance. For instance, students who explain example problems to themselves learn better, are more accurate in self-assessments of what they know and use analogies more effectively. Chi and VanLehn (1991) analysed the verbal protocols of effective and ineffective learners and found that good learners "made more comments about the conditions under which specific actions were advisable, the relationships between actions and goals, the consequences of actions, and the meanings of mathematical expressions".

Clearly, the correlation between the nature of concurrent verbalisation and problem solving performance does not, alone, form a basis for causal inference about the processes involved. However, the results of experiments involving formal models created and tested as computer programs add weight to the claim that explanation-based learning is a necessary component for effective problem solving (VanLehn, Jones, & Chi, 1992). Referring to the work of Brown and her colleagues, VanLehn et al., comment "Because reciprocal teaching increases the amount of explanation giving, and explanation giving is similar to self-explanation, reciprocal teaching may succeed just because it encourages 'explanation-based learning of correctness' and the other processes modelled" (p. 54).

The implication of research into the self-explanation effect, which claims a causal role for language in cognitive control, is that any educational intervention which succeeds in improving children's ability to explain their own activities should result in improved problem solving abilities.

Given the importance of self-regulatory activity for communicative and cognitive development, it is hypothesised that children with learning problems lack specific skills in self-reg-

ulation which result from, and lead to, language and communication difficulties. The purpose of the initial stage of the research described in this paper is to establish this link between communicative competence and education performance and to identify any other variables which may be affecting the performance of this population of children; specifically, age, gender, season of birth, IQ and social background. The profile will also serve to provide a baseline against which to monitor progress during the intervention.

Children with moderate learning difficulties

The children in the study are all attending special education schools for children with "moderate learning difficulties" (M.L.D.). Children are placed in these schools after initial identification by their class teacher in a mainstream school and subsequent referral by an educational psychologist. Although the schools officially cater for children with general learning disability, in reality the schools provide for children with a wide range of difficulties which include specific learning or language difficulties, emotional and behavioural problems and severe learning difficulties (Rutter, Tizard, & Whitmore, 1970). Several issues are particularly pertinent to the education of this group of children and are discussed below.

Season of birth. It is increasingly thought that season of birth may have implications for academic achievement and referral to special education. Various studies, both in this country and the USA, have shown that summer-born children (those born between May and August) tend to be over-represented in special schools and child guidance clinics compared to children born during the autumn term (September to December) and spring term (January to April) (Williams, Davies, Evans, & Ferguson, 1970). The summer-born group have also been found to do less well academically (Pidgeon & Dodds, 1961), have their abilities underestimated (Pumfrey, 1975) and are more likely to be considered to have emotional and behavioural problems (Mortimore, Sammons, Lewis, & Ecob, 1988; Tarnowski, Drabman, Anderson, & Kelly, 1990)[1].

The over representation of summer-born children in these groups is frequently described as being due to characteristics of the British education system. Children born in the summer commonly spend less time in their first or infant school as a result of the entry criteria of local education authorities. It is this "term of entry effect" which prompted the Plowden committee's recommendation of a uniform date of entry for all children, irrespective of birthdate, so that every child spends three full years in their infant school (Department of Education and Science, 1967) . It has also been suggested that the summer-born child is disadvantaged by being the youngest in the class (assuming it is a single-age class). Williams et al. (1970) refer to this as the "age group effect". The situation may be exacerbated by the fact that summer-born children often begin school life when the class size is at its largest, and after the majority of children have settled into the routine of full-time education.

In an attempt to distinguish the main contributor to the "season of birth effect", Williams et al. (1970) conclude that it is the "age group effect" which is responsible, not the "term of entry" effect and thus suggests that an equal length of infant schooling as recommended by Plowden will not remove the extra handicaps which these children experience. It appears that summer-born children may constitute an "at risk" group which will not be wholly remedied by ensuring more schooling in the infant years. As Williams et al. (1970) suggest, these children require a different system of education not simply more education.

Carroll (1992) demonstrates that summer-born children also have the poorest attendance rates, which may contribute to, or be an effect of, difficulties at school. She also claims that children who are young in their class are disproportionately perceived by their teachers and peers as the least mature academically and socially.

Whatever the cause of the "season-of-birth effect", summer-born children, particularly those who struggle academically, undoubtedly face increased stresses which may lead to their being identified as having emotional, behavioural or learning problems. Such research has obvious implications for the identification of children having special educational needs and

the consequent referral to special education. For this reason, season of birth is included in the present analysis.

Gender. It has commonly been reported that significantly more boys than girls are identified as having learning difficulties (see for example, Eme, 1979; Mumpower, 1970). Indeed, the number of boys attending special schools for learning difficulties generally outweighs the number of girls (Pumfrey, 1975). Several reasons for this bias towards male referral have been presented. Mirkin (1982; cited by Vogel, 1990) suggests that teacher referral of children who are struggling academically is commonly subject to the biasing influence of the child's social behaviour. In her review of the literature concerning gender differences in children with more specific learning difficulties, Vogel (1990[2]) comments that females with learning difficulties are less likely to demonstrate disruptive behaviour or hyperactivity and their attentional deficits are likely to be less severe than their male peers. Caplan (1977) suggests that girls' learning problems may be construed by the teacher as emotional rather than cognitive which may also result in them being less readily identified as in need of special education. It appears, then, that the identification of boys with learning difficulties is sometimes likely to be more to do with their social behaviour than with the nature of their learning difficulties.

Despite this over-representation of boys in special education, it has been found that within the special school population, boys commonly have higher IQ scores than their female peers (Vogel, 1990). In an attempt to uncover any differential gender effects within the M.L.D. population, gender was included in the following analysis.

Intelligence. In the past, IQ scores have been used to determine a child's placement in special education. Once a child was identified by his/her class teacher as having difficulties and referred to the educational psychology service, a psychologist or medical officer would perform a standard IQ assessment and, depending on the result of this, the child would be placed in appropriate special education. An IQ below 50 would lead to the label of severe learning difficulty (or Educationally Sub-Normal (Severe) as it was known) and the child would be placed in a special school for children with severe difficulties. Children with an IQ score of between 50 and 75 would be described as having moderate learning difficulty (or Educationally Sub-Normal (Moderate)) and would be placed in a special school for children with less severe difficulties.

Since the Warnock Report (D.E.S., 1978) there has been an increasing shift towards staged approaches to identifying and assessing special educational needs. This shift of emphasis to teaching arrangements and resources when making a decision about special-school referral means that measures of "IQ" are no longer a necessary part of the assessment process. It is therefore highly likely that the range of IQ scores of pupils attending schools for moderate learning difficulty is greater today than it has been in the past. A measure of IQ has therefore been included in the present analysis.

Social background. Social backgrounds of children with mild learning difficulties have historically been a subject of much debate. The fact that a large proportion of children being classified as having mild learning difficulties coming from the "working class" population (Tomlinson, 1982) has highlighted issues of social selection and differentiation intrinsic to the school system.

The percentage of children taking free school meals differed between the two schools who participated in the study. "School attended" was therefore taken as an indicator of social background and used as a variable in the analyses.

The profile of abilities therefore comprises measures of educational performance, specifically of reading skill and communication in order to establish any link between the two, as presupposed by Ann Brown and her colleagues (Brown & Ferrara, 1985). Biographic factors of age, gender and season of birth have been included to determine their effects on the abilities of this population. Measures of IQ have also been taken.

Method

A total of 87 children, 60 males and 27 females (mean age 13.9 years, s.d. 1.35, range 11.5-15.4 years) completed a battery of tests. These included an intelligence test, assessments of their reading and a communication skills task. All testing took place in a quiet room within the child s school over a period of two terms. Each child was therefore seen on three separate occasions. The tests lasted between approximately 20 minutes (reading assessment) and 60 minutes (I.Q.), obviously varying with the age and ability of the child. The children came from two Nottingham schools catering for children with moderate learning difficulties and all spoke English as their first language. Consent had been given by all parents. A total of 16 children were discarded from the present study for a variety of reasons. Eight (5 males and 3 females) children failed to achieve a score on both the reading comprehension and reading accuracy tests. Two children (both males) achieved a reading accuracy score but failed to obtain a reading comprehension score. Six children (4 males and 2 females) achieved a reading comprehension score but failed to achieve a reading accuracy score.

Measures

Intelligence. An abbreviated version of the Wechsler Intelligence Scale for Children, Revised (WISC-R; Wechsler, 1974) was administered by two experienced Educational Psychologists according to the WISC-R manual. This version consists of two verbal subtests: Information and Comprehension and three performance subtests: Picture Arrangement, Block Design and Coding (Kennedy & Elder, 1982).

Reading Ability. This was assessed by a trained researcher using the Individual Reading Analysis and the New Reading Analysis (Vincent & de la Mare, 1985a, 1985b). This test measures both reading accuracy and comprehension. The test was administered according to the criteria in the assessment manual with the exception of the comprehension measure which was adapted to suit the particular needs of this group of children. The manual states that if a reader can make no attempt at an unknown word then they are to leave it out and go on to the next one. This can cause problems, however, with this group of children, who are quite likely to give up altogether if they cannot read a word and are not supported by the adult. If a child could make no attempt to read a word, the tester read the word for them.

Communication Skill. Communication skill was assessed by the same researcher using a series of tasks taken from Concept Seven-Nine (Schools Council, 1972). These tasks are used to provide a general picture of children's ability to use spoken language to transfer information and to give and follow instructions. Pairs of subjects sit facing each other across a table divided by a low screen preventing them seeing each other's materials. Both subjects have a similar booklet containing five diagrams of increasing complexity, drawing paper and a red and blue pen. The children take it in turns to describe the first diagram in their booklet for their partner to draw. When the instruction follower (I.F.) thinks that they have completed the diagram, they pass it over the screen to the information giver (I.G.) The I.G. compares this diagram with the original and reconstructs the description if the match is not acceptable. This continues until the experimenter and the I.G. agree to accept the I.F.'s diagram. The children then change roles. Both children are encouraged to ask each other questions.

The activity continued in this way until both subjects had described and drawn five diagrams. As long as the children were still able to concentrate and succeed at the task, the experimenter gave both children another booklet each with more complex diagrams and the procedure started again. The activity continued until either the experimenter thought that the tasks were getting too hard, and the children were beginning to struggle to concentrate, or the final pair of booklets (booklets 9 and 10) had been completed. The experimenter intervened, where necessary, to keep the children on task. The performance of each pair of children was videotaped.

The highest level of complexity reached (as indicated by the highest book number achieved) was taken as a measure of communication skill. Clearly, using outcome measures from a collaborative task raises issues about the independence of the measures. Measures of communication are necessarily measures of joint achievement. However, our aim here is to see if such a measure relates in any theoretically coherent way to other independent measures of both biographic characterstics and educational performance.

Results

Due to the high attrition rate of children from the study, this paper reports on the profiles of the 71 children who completed the full battery of tests. An inspection of the age, gender and season of birth of the children not included revealed similar distributions to the total sample.

Table 1 shows the number of males and females in the sample and the proportion of children born during the autumn, spring and summer. Bivariate correlations of all measures are shown in Table 2. There was no correlation between social background and any of the measures, so this variable was discarded before any further analyses.

Table 1

Gender and season of birth of sample

Sex	Autumn (Sept.-Dec.)	spring (Jan.-April)	summer (May-Aug.)	Total
males	13 (18%)	9 (13%)	23 (32%)	45 (63%)
females	4 (6%)	6 (8%)	16 (23%)	26 (37%)
total	17 (24%)	15 (21%)	39 (55%)	71 (100%)

Table 2

Zero-order correlations

	age	gender	season of birth	I.Q.	reading accuracy	reading comp	communication
age							
gender	.066						
season of birth	-.007	-.101					
I.Q.	-.136	.370**	.402**				
reading accuracy	.131	-.099	.234	.113			
reading comp.	.123	.224	.349**	.494**	.426**		
communication	.367**	.165	.358**	.548**	.121	.335**	

Note. * $p<0.05$; ** $p<0.01$.

Age was significantly and positively correlated with communication skill. Surprisingly, however, age does not correlate with either reading measure, despite the wide age range (11 to 16 years) sampled. Significant correlations also existed between IQ and gender, season of birth, reading comprehension and communication skill. Season of birth was significantly correlated with IQ, reading accuracy, reading comprehension and communication skill. There were significant and positive relationships between reading comprehension and reading accuracy and reading comprehension and communication skill. All other correlations failed to reach significan

Whilst communication skill is associated with reading comprehension, there is no correlation between communication and reading accuracy. In the present study, communication skill describes the ability to transfer information and negotiate meaning. Other aspects of children's communicative competence include having confidence to initiate interactions with teachers and knowing when and how to request help when in difficulty. These latter skills may be of more use for children facing problems in decoding the written word. Alternatively, the test of reading accuracy may be tapping phonological and decoding skills (for example, Bryant & Bradley, 1985) which may be independent of communication skills. Whatever the explanation, the best fit model investigated predicts that improvements in communication skill will exert no direct influence on reading accuracy, though there may be effects mediated by any improvements in IQ or reading comprehension.

In building a model of the inter-relations between biographical and cognitive factors, issues of gender and season of birth have been raised. As found in previous studies, the proportion of males and summer-born children in the sample is greater than would be expected in the normal population. At the same time, within the present sample of children, both males and summer-born children are generally out-performing their peers on a standardised test of intelligence. It is interesting to note that the effects of both gender and season of birth on reading comprehension are mediated by IQ.

Many researchers have drawn attention to the differences in social behaviour between boys and girls (e.g., Drabman, Tarnowski, & Kelly, 1987) and between summer birthday and non-summer birthday children (e.g., Williams, 1984). Girls with learning difficulties are likely to develop behaviour patterns characterised by withdrawal and introversion whereas boys are more likely to demonstrate demanding behaviour (Vogel, 1990). This difference in behaviour causes problems on two counts. First, it may result in girls not being referred to special education when they present quite severe learning difficulties. In contrast, boys with less severe learning difficulties who manifest behaviour problems may be identified as requiring special education. If these do occur, then among the special school population girls are more likely to demonstrate greater learning difficulties than boys. This is reflected in the present study by the lower IQ scores of the girls and by results showing that the boys outperformed the girls on measures of communication and reading comprehension.

Not only do summer-born children in the sample have higher IQ scores but they are also more proficient in reading accuracy, reading comprehension and communication. This "season of birth" effect appears to be opposite to the effect recognised in mainstream education where children born in the summer are reported to be disadvantaged due to their later admittance to infant schooling and the fact that they remain the youngest in their class. It seems that the problems which children face as a result of their summer birthday, may put them at greater risk of being identified as having learning difficulties. However, our results suggest that, once in special schools, these children generally do better than their peers. Bibby, Lamb, Leyden and Wood (1996) suggest that these gender and season-of-birth effects may be due to a selection bias operating during the identification process.

Age is not directly related to reading accuracy nor to reading comprehension, despite a sample range of 11 to 16 years. A possible explanation of this result is that the children in the sample have reached a "plateau" in their reading by the time they are about 11 years of age. At the moment, however, no other obvious explanation for this finding presents itself.

The preliminary profile of abilities of these children has served several functions. Primarily, as predicted, it has identified a relationship between communication skill and reading ability (mediated by IQ). Secondly, the profile has provided a baseline against which the success of future intervention studies may be assessed. According to the model, any change in children's communication abilities due to an intervention should lead to changes in IQ and further onto reading comprehension and reading accuracy. In developing a model of the relationships between biographic and cognitive factors, the profile has also identified several factors which may serve to heighten the probability of a child with learning difficulties being referred to special education and identified differences in educational performance associated with gender and season of birth.

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Table 3

Descriptive statistics: Means and standard deviations (in brackets)

	I.Q.	reading accuracy	reading comprehension	communication (range 1-10)
female	59.2 (9.79)	7.6 (1.10)	8.0 (0.85)	6.9 (1.83)
male	67.5 (10.35)	7.4 (1.29)	8.5 (0.95)	7.6 (1.85)
summer-born	68.4 (10.54)	7.7 (1.14)	8.6 (0.95)	7.9 (1.68)
not summer-born	59.7 (9.30)	7.2 (1.26)	7.9 (0.79)	6.6 (1.83)

Table 3 shows the means and standard deviations (in brackets) of all measures split by gender and season of birth. "Summer born" describes those children born between May and August. "Not summer born" constitutes children born in the months between September and April. Reading scores are age equivalents.

T-tests carried out on the data shown in table 3 demonstrated that the males and summer-born children had significantly higher IQ scores than females and children not born in the summer (gender: t=3.31, p<0.01; season of birth: t=3.66, p 0.01). Summer-born children also out-perform children born during the rest of the year in reading accuracy (t=2.01, p<0.05), reading comprehension (t=3.10, p<0.01) and communication skill (t=3.19, p<0.01)2.

The correlation matrix was subjected to a LISREL (Jörsekog & Sorbom, 1984) path analysis in order to assess the best fit to the data. A null model that specified no relationships between the variables was used as a comparison model. Four models were computed based on the zero-order correlation matrix. In each of these models a path was specified from season of birth to IQ, communication ability, reading comprehension and reading accuracy. Similarly all four models had paths from gender to IQ and from age to communication ability. The direction of the paths for the biographic variables was always from the biographic variable to the measured variable. All four models included a direct path between communication ability and reading comprehension. Using these path specifications two pairs of LISREL models were computed. In the first pair of models it was hypothesised that IQ predicts communication ability. In the second pair of models it was hypothesised that communication ability predicts IQ. Within the model pairs, the models differed according to whether it was hypothesised that reading comprehension predicted reading accuracy or vice versa.

In terms of the fit statistics, all four models were appreciably better than the null model. At the same time the final model was the best fitting model with respect to all the fit statistics (see Table 4). The first two models which embody the hypothesis that IQ predicts communication ability do not successfully reproduce the correlation matrix. The χ^2 statistic shows that these models produce a pattern of covariance that is significantly different to the zero-order correlations to be explained. The second pair of models in which communication ability predicts IQ are not significantly different from the zero-order model. In other words, both these models are able to reproduce the original correlation matrix. The best fit overall is obtained when communication ability predicts IQ and reading comprehension predicts reading accuracy.

Not all the specified path coefficients for the best fitting model are significant. With respect to the biographic variables, the paths between season of birth and both reading comprehension and reading accuracy are not significant. The path between communication skills and reading comprehension is not significant either. The effects of gender, season of birth and communication skills on reading comprehension are all mediated by IQ. Age has a direct effect on communication ability and reading comprehension has a direct effect on reading accuracy. Figure 1 shows the significant standardised path coefficients.

Table 4

Fit statistics for the LISREL models

Model	χ^2(df)	p	GFI	TLI	RNI	$\Delta\chi^2$	Δdf
Null Model	67.22 (12)	0.001	0.82				
IQ → Communication; Accuracy → Comprehension	32.32 (16)	0.001	0.87	0.78	0.70	34.90	4
IQ → Communication; Comprehension → Accuracy	32.44 (16)	0.009	0.89	0.78	0.70	34.78	4
Communication → IQ; Accuracy → Comprehension	25.48 (16)	0.064	0.90	0.87	0.83	41.74	4
Communication → IQ; Comprehension → Accuracy	18.59 (16)	0.290	0.93	0.96	0.95	48.63	4

Note. GFI=goodness-of-fit index; *TLI*=Tucker-Lewis index; *RNI*=relative noncentrality index. For further details refer to Gerbing and Anderson (1993).

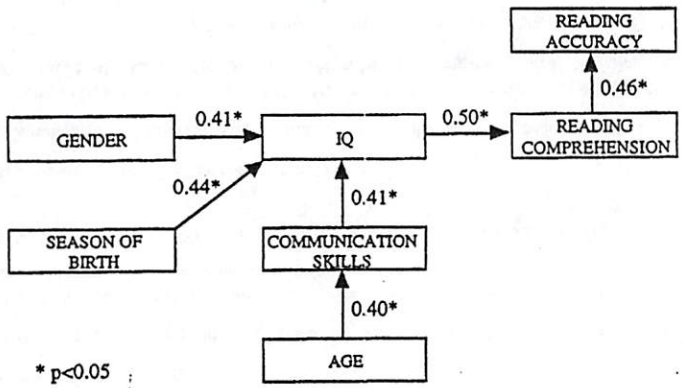

Figure 1. Standardised Path Coefficients (N=71)

Discussion

Building up a profile of children's abilities has enabled the development of a model which accounts for the inter-relations of various biographical factors with aspects of the children's academic achievement. In the best fitting model the expectation that communication skill would predict educational performance receives support. It was hypothesised that communication skill would be related to reading and this relationship is demonstrated though it is mediated by intelligence.

The association of communication skill with reading comprehension is consistent with the premise underlying the work of Ann Brown and her colleagues which was reviewed in the introduction. Their claim is that children who use spoken language effectively to describe, question and clarify, are able to achieve higher levels of reading comprehension. The present study offers some support for their position and for Vygotsky's claims about the effects of communication on the development of self-regulation. To date we have used a simple performance measure of joint achievement to assess communication skill. It is now necessary to extend such analyses to examine the individual contributions of the participants in both giving and receiving information and in controlling the interactional process.

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Notes

1 Work such as Vogel s is based on the education system in the USA and as such is likely to refer to children with specific learning difficulties, e.g., dyslexia, as much as children with generalised moderate learning difficulties. Some caution should be exercised in extrapolating these results to the British educational system.

2 A Multivariate Analysis of Variance performed on these data revealed no interaction between gender and season of birth.

Cet article concerne certains aspects des compétences intellectuelles, linguistiques et scolaires de 71 enfants présentant des difficultés modérées d'apprentissage. On présente et on analyse le profil de ces compétences. Ce profil fournit un rationnel pour mettre en place une intervention de longue durée destinée à développer les compétences communicatives de ces enfants. Il fournit également un modèle de base permettant d'évaluer les effets de l'intervention. De plus, le profil explore les relations entre plusieurs aspects de la réussite scolaire et des caractéristiques individuelles comme l'age, le sexe, la saison de naissance et le QI. Les analyses statistiques mettent en évidence l'existence de relations significatives entre plusieurs variables étudiées. Les auteurs examinent les implications de leurs analyses pour les pratiques éducatives.

Key words: Communication, Intervention, Moderate learning difficulty, Reading.

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Current theme of research:

Reading and communication skills of children with moderate learning difficulties.

Most relevant publications in the field of Psychology of Education:

Bibby, P.A., Lamb, S.J., Leyden, G., & Wood, D. (1996). Season of Birth and Gender Effects in Children attending Moderate Learning Difficulty Schools. *British Journal of Educational Psychology, 66*, 159-168.

Lamb, S.J., & Wood, D.J. (1994). Peer Interaction and Communication Skills in Children with Moderate Learning Difficulties. In H.C. Foot, C.J. Howe, C.J. Howe, A. Anderson, A.K. Tolmie, & D.A. Warden (Eds.), *Group and Interactive Learning* (pp. 351-356). Southampton: Computational Mechanics Publications.

Peter Bibby. Department of Psychology, University of Nottingham, University Park, Nottingham NG7 2RD, U.K.

Current theme of research:

Children with learning difficulties.

Most relevant publications in the field of Psychology of Education:

Bibby, P.A., Lamb, S.J., Leyden, G., & Wood, D. (1996). Season of Birth and Gender Effects in Children Attending Moderate Learning Difficulty Schools. *British Journal of Educational Psychology, 66*, 159-168.

David James Wood. Department of Psychology, University of Nottingham, University Park, Nottingham NG7 2RD, U.K.

Current theme of research:

Instructional science and learning processes.

Most relevant publications in the field of Psychology of Education:

Wood, D., Wood, H., Ainsworth, S.J., & O'Malley, C. (1995). On becoming a tutor: Toward an ontogenetic model. *Cognition and Instruction, 13*, 565-581.

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Current theme of research:

School development, effectiveness and meeting special needs.

Most relevant publications in the field of Psychology of Education:

Leyden, G., & Miller, A. (1996). Interviewing with Peer Groupings: Research and Practice. *Educational Psychology in Practice. Editorial 11*, 3, January 1996.

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Theory, experiment and practical application in research on visual impairment

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This paper examines the relation between theories of development in conditions of visual impairment, the experimental evidence on which models are based, and methods of education and remediation. It is argued that experimental findings always need fine-tuning to be adapted to individual circumstances and needs. Equally, practical procedures are based on tacit assumptions which need to be scrutinised explicitly, so that they can be updated when the empirical evidence suggests changes in our models of the role of the sense modalities in development. Spatial skill and braille learning are used as examples.

The first section discusses how theory and practice are reciprocally affected by simplistic dichotomies like the "nature-nurture" distinction, and the notion that vision is either necessary, or else irrelevant to spatial understanding. Spatial development is explained next by the CAPIN hypothesis which assumes that total absence of sight requires convergent and redundant, not just substitute, information and underlines the importance of specific task conditions. A third section focuses on the dual verbal and spatial processing demands of braille. The two final sections deal with empirical methods in asking questions about blindness in psychology and education.

Absence of sight raises both theoretical and practical questions. It is not always clear how theory and practice relate to each other, or indeed, whether they do. I shall argue that the connection between theoretical and practical questions and empirical findings is extremely important both for good models, good experiments and good practice. But the relation is not a simple one. This paper attempts to tease out some of the complexities by examples from two areas: spatial development in conditions of total congenital blindness and reading by touch.

Explicit and implicit aspects of models of development in visual impairment

A typical theoretical question about blindness, to which practical concerns are apparently irrelevant, concerns the role of the senses in thinking. It is an old question that goes back at

Suport[illegible]s work from "Blindness, Research for Learning, Work and Leisure' is gratefully acknowledged".

8/8/06

French et al → P-E-F → cul EPS services

"If EPs not supported by services, how well can they meet the needs of clients"

for better exposition of O/H model

clearly written

"Role of supervision: leading org. & the care of EP services"

paper 5.6 (cul 5.2)

LINK

Connect (with)

Burnout among teachers
Burnham of school (8!)

School 3 (F.F.)
HT. → attendance ← lo ↓ but still in 'right direction'

Not much [illegible]

TEACHER WELLBEING + O/H (pp 1–22)

INCIDENCE of T.STRESS → 30% → BACKGROUND

Cox/Kyriacou

Gen: All Cox transactional Model
Dewe + Lazarus → cognitive state → Lazarus → Appraisal
pollution, pressures, Karasek

Sources of stress: turbulent pupils / work overload

O/H of schools → Cox Model; French et al 'Fit' → individual, design

OH Q + GWBQ

SURVEY: 3 × Admin → OHQ, GWBQ

RESULTS
Teacher = 'W/O' (30%) → v. W/O (16%)
O/H model supported

INTERVENTION: workshops × 4 → PSM design → 'Semi auto gr' → Task/Dev/PS environ

School 6 (Beveridge)
Significant! Reduced W.O. score
Significant! → Increased O.H/Dev. score
"Crossover effect"

* Type A + Submit school quote

!Revise! Michigan Model to ⊕ Health, schools

!CHECK!

SECTION 3 "Creating safer, healthier schools"

~~pp 21 – 32 = 11 pages~~

p.p. 16 – 22 = 7 pages

* see Type overleaf!

NB: expand on definition of healthiness = goodness of fit: Michigan Model

- increase in OHR dev dimension other? Task? P.M.M.?
- 5 x 22 in sum term!
- Wider Res + Dev role of EP; Vic University LINKS!

Original Findings

- Intervention
- decreased stress (reversing trend in survey)
- improved school health (Level dimension)

Revise Michigan Model!

P-E-F

Context

Subtheme: "Need to support X's so they support + teach the pupils."

Creating healthier schools

Theoretical framework

Michigan Model of health at ed. org

SECTION 3

Violence = Kids estate + schools: Teacher fears of v. "What do I do ...?"

CONTEXT →
- Dunblane
- Murder of HT Phillip Lawrence
- Wolverhampton machete attack
- (necessary?)

NB: Safer (Not safe!) teacher system → pupils

Making Schools Safer p.16.

"Theoretical Framework" →
- OCC psych
- Pubs + violence
- Public sector violence
- Environmental Office → toxic waste
- housing officer → SSD home visits
- COHD + TOM → Phil, Clare

dearth of theory and evidence re violence in schools → glut of hearsay + opinion → lit + res. audit + survey, workshops, its, create model of v. in schools ← Analysis of teacher tasks + "risk"

Eps + dnss

"Original findings" →
- "theoretical ed. org + occ model + teacher systems"
- "Creation of whole school strategy to reducing violence"
- "Consultancy planning"
- "(But) Schools Safer"
- links schools, partnership

(Posi Paper)

CHECK!
CHECK!
CHECK!

Database of studies pro Inc. Ed
↓
Evidence?
USA → 5ks → gaps & evidence?
OECD pubs?

SECTION 4
"Including children and young people with disabilities in mainstream schools"

PP 23 – 32 = 10 pages

(Typos overleaf)

Steinfeld + Steinfeld?
→ Audit Commission & Quality of learning?
→ Steinback + Steinback

"epileptic colony"

SECTION 4
p. 23

CONTEXT
→ intro: values / civil rights
→ Research perspective
→ links between theory and EP practice

"? Why inclusive ed?"
CIVIL RIGHTS
"colonies"
HAMILTON VISITS → "participant observation"
↓
EACH BECOMES!
NEWHAM . . . .

"CRITICAL EXAM. of EP PRACTICE"

Research Perspective on Inc. Ed.
→ Probs of methodology (Research) (See p. 25)
→ Definitions of inc. schools?

Stigma of children
misleading parents
false claims re special ed
→ Reconstitution?
→ also school leavers
→ stultifying progress
See CREDIT pos.

→ Reconstitution

Inc. Ed. BPS + Prof. Practice
CSIE Charter (+) Posi Statement
see p. 26
Re-Read Posi Paper!

Original Contributions: 4 Theory, Inc ed, EP practice
p. 27
= applying new ed settings (inc schools)
→ EP Relationship re-read
→ Myths & peer support
Friend + friendship
"Dance Work" → "learn + collaborate . . ."
"2 ways we can work right"

Power
Contingent teaching
Scaffolding
peer mediated learning
work ?
role of support: Role Model
EP?

Inclusive Tools!
Introductions / PATH / COF
J+M
Inclusion Ed. Big Days!
Nick Lunn

Empowerment / ? (Costs)
→ Reason / "Reason"
→ "Nous + Ins" → parent → EP ? (NE, ADD?) + Support
→ parents

"The spoken Ed business"
Reason / Reason "Statements
Statement 4 Statement
& ... ?
STATEMENTS
PLACEMENTS"

"Strategic Aff"
"Children First"
"Press"
p. 32

READ SUMMARY
P. 30!

"EACH BECOMES"
"Press"