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Characteristics of pre-school environments in Northern Ireland: An analysis of observational data

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Abstract

This longitudinal study assesses the attainment and development of children followed between the ages of 3 and 7 years. Over 700 children were recruited to the study during 1998 and 1999 from 80 pre-school centres. Both qualitative and quantitative methods (including multilevel modelling) are used to explore the effects of pre-school experience on children's cognitive attainment and social/behavioural development at entry to school and any continuing effects on such outcomes up to 7 years of age. In addition to the effects of preschool experience, the study investigates the contribution to children's development of individual and family characteristics such as gender, family size, parental education and employment. This overview describes the research design and discusses a variety of research issues (methodological and practical) in investigating the impact of pre-school provision on children's developmental progress. A parallel study is being carried out in England (EPPE).

Keywords

ireland, northern, observational, environments, analysis, school, pre, data, characteristics

Disciplines

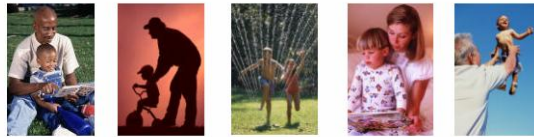
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Effective Pre-school Provision in Northern Ireland (EPPNI)

Characteristics of Pre-school Environments in Northern Ireland: An analysis of observational data.

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OVERVIEW OF THE PROJECT

This longitudinal study assesses the attainment and development of children followed between the ages of 3 and 7 years. Over 700 children were recruited to the study during 1998 and 1999 from 80 pre-school centres. Both qualitative and quantitative methods (including multilevel modelling) are used to explore the effects of pre-school experience on children's cognitive attainment and social/behavioural development at entry to school and any continuing effects on such outcomes up to 7 years of age. In addition to the effects of pre-school experience, the study investigates the contribution to children's development of individual and family characteristics such as gender, family size, parental education and employment. This overview describes the research design and discusses a variety of research issues (methodological and practical) in investigating the impact of pre-school provision on children's developmental progress. A parallel study is being carried out in England (EPPE).

Previous Research on the Effects of Early Education in the UK

There has been little large-scale, systematic research on the effects of early childhood education in the UK. The 'Start Right' Enquiry (Ball 1994; Sylva 1994) reviewed the evidence of British research and concluded that small-scale studies suggested a positive impact but that large-scale research was inconclusive. The Start Right enquiry recommended more rigorous longitudinal studies with baseline measures so that the 'value added' to children's development by pre-school education could be established.

Research evidence elsewhere on the effects of different kinds of pre-school environment on children's development (Melhuish et al. 1990; Melhuish 1993; Sylva & Wiltshire 1993; Schweinhart & Weikart 1997; Borge & Melhuish, 1995; National Institute of Child Health Development 1997) suggests positive outcomes. Some researchers have examined the impact of particular characteristics, e.g. gender and attendance on children's adjustment to nursery classes (Davies & Brember 1992), or adopted cross-sectional designs to explore the impact of different types of pre-school provision (Davies & Brember 1997). Feinstein, Robertson & Symons (1998) attempted to evaluate the effects of pre-schooling on children's subsequent progress but birth cohort designs may not be appropriate for the study of the influence of pre-school education. The absence of data on children's attainments at entry to pre-school means that neither the British Cohort Study (1970) nor the National Child Development Study (1958) can be used to explore the effects of pre-school education on children's progress. These studies are also limited by the time lapse and many changes in the nature of pre-school provision which have occurred. To date no research using multilevel models (Goldstein 1987) has been used to investigate the impact of both type of provision and individual centre effects. Thus little research in the UK has explored whether some forms of provision have greater benefits than others.

In the UK there is a long tradition of variation in pre-school provision both between types (e.g. playgroup, local authority or private nursery or nursery classes) and in different parts of the country reflecting funding and geographical conditions (i.e. urban/rural and local access to centres). A series of reports (House of Commons Select Committee 1989; DES Rumbold Report 1990; Ball 1994) have questioned whether Britain's pre-school education is as effective as it might be and have urged better co-ordination of services and research into the impact of different forms of

provision (Siraj-Blatchford 1995). The EPPNI and EPPE projects are thus the first large-scale British studies on the effects of different kinds of pre-school provision relating experience in particular centres and type of centre to child development.

Overview of Research Methods

The EPPNI and EPPE projects investigate three issues that have important implications for policy and practice:

- the effects on children of different types of pre-school provision,
- the 'structural' (e.g. adult-child ratios) and 'process' characteristics (e.g. interaction styles) of more effective pre-school centres, and
- the interaction between child and family characteristics and the kind of pre-school provision a child experiences.

The research design was chosen to enable investigation of the progress and development of individual children (including the impact of personal, socio-economic and family characteristics), and the effect of individual pre-school centres on children's outcomes at entry to school, through to age 7. The growing field of school effectiveness research has developed an appropriate methodology for the separation of intake and school influences on children's progress using so called 'value added' multilevel models (Goldstein 1987, 1995). As yet, however, such techniques have not been applied to the pre-school sector, although recent examples of value added research for younger ages at the primary level have been provided by Tymms et al. (1997); Sammons & Smees (1998); Jesson et al. (1997); Strand (1997); and Yang & Goldstein (1997). These have examined the relationship between baseline assessment at reception to infant school through to age 7.

The 8 aims of the EPPNI Project

- To produce a detailed description of the 'career paths' of a large sample of children and their families between entry into pre-school education and the first three years of primary school.
- To compare and contrast the developmental progress of 800+ children from a wide range of social and cultural backgrounds who have differing pre-school experiences.
- To separate out the effects of pre-school experience from the effects of education in the primary school period years 1, 2 and 3.
- To establish whether some forms of pre-school experience are more effective than others in promoting children's cognitive and social/emotional development during the pre-school years (ages 3-4) and the first three primary years (4-7 years).
- To discover the individual characteristics (structural and process) of pre-school education in centres found to be most effective.
- To investigate differences in the progress of different groups of children, e.g. children from disadvantaged backgrounds and both genders.

- To investigate the medium-term effects of pre-school education on educational performance at age 7 in a way which will allow the possibility of longitudinal follow-up at later ages to establish long-term effects, if any.
- To relate the use of pre-school provision to parental labour market participation.

The sample: centres and children

In order to maximise the likelihood of identifying the effects of various types of provision, the EPPNI sample was stratified by type of centre and geographical location. The centres were chosen to include a selection of nursery classes and schools, playgroups, private day nurseries, reception classes and reception groups. Thus examples of all major types of pre-school centre in Northern Ireland were included in the study.

Over 700 children were recruited from 80 pre-school centres from all Education & Library Boards in Northern Ireland. Children and their families were selected randomly in each centre to participate in the EPPNI Project. All parents gave written permission for their children to participate. In order to examine the impact of no pre-school provision, an additional sample of 150 children with no pre-school experience were recruited from the year 1 classes which EPPNI children entered.

The progress and development of pre-school children in the EPPNI sample is being followed over four years until the end of year 3 of primary school. Details about length of sessions and number of sessions normally attended per week have been collected to enable the amount of pre-school education experienced to be quantified for each child in the sample. Two complicating factors are that a substantial proportion of children have moved from one form of pre-school provision to another (e.g. from playgroup to nursery class) and some will attend more than one centre in a week. Careful records are necessary in order to examine issues of stability and continuity, and to document the range of pre-school experiences to which individual children can be exposed.

Child assessments

Around the third birthday, or up to a year later if the child entered pre-school provision after three, each child was assessed by a researcher on four cognitive tasks: verbal comprehension, naming vocabulary, knowledge of similarities seen in pictures, and block building. A profile of the child's social and behavioural adjustment was completed by the member of the pre-school staff who knew the child best. If the child changed pre-school before school entry, he or she was assessed again. At school entry, a similar cognitive battery was administered along with knowledge of the alphabet and rhyme/alliteration (literacy measures). The year 1 teacher completed the social behavioural profile.

Further assessments are made at the end of Year 2. In addition to standardised assessments of reading and mathematics, information on school progress, attendance and special needs will be collected. At age 7, children will also be invited to report themselves on their attitudes to school.

Measuring child/family characteristics known to have an impact on children's development

- 1) Information on individual 'child factors' such as gender, language, health and birth order was collected at parent interview.
- 2) Family factors were investigated also. Parent interviews provided detailed information about parent education, occupation and employment history, family structure and pre-school attendance. In addition, details about the child's day care history, parental attitudes and involvement in educational activities (e.g. reading to child, teaching nursery rhymes, television viewing etc) have been collected and analysed.

Pre-school Characteristics and Processes

Regional researchers interviewed centre managers on: group size, child staff ratio, staff training, aims, policies, curriculum, parental involvement, etc. 'Process' characteristics such as the day-to-day functioning within settings (e.g. child-staff interaction, child-child interaction, and structuring of children's activities) were also studied. The Early Childhood Environment Rating Scale (ECERS) which has been recently adapted (Harms, Clifford & Cryer 1998) and the Caregiver Interaction Scale (Arnett 1989) were also administered. The ECERS includes the following sub-scales:

- Space and furnishings
- Personal care routines
- Language reasoning
- Activities
- Interaction
- Programme structure
- Parents and staffing

In addition four additional ECERS sub-scales (ECERS-E) describing educational provision in terms of: Language, Mathematics, Science and the Environment, and Diversity were also used in each pre-school centre.

Case Studies

In addition to the quantitative data collected about children, their families and their pre-school centres, detailed qualitative data will be collected using case studies. The case studies were of some “effective” pre-school centres (chosen retrospectively as ‘more effective’ on the basis of the analyses of ECERS-R, ECERS-E and Inspection Report). This will add the fine-grained detail to how processes within centres articulate, establish and maintain good practice.

The methodology of the EPPNI project is thus mixed. These detailed case studies will use a variety of methods of data gathering, including documentary analysis, interviews and observations and the results will help to illuminate the characteristics of more successful pre-school centres and assist in generating guidance on good practice. Particular attention will be paid to parent involvement, teaching and learning processes, child-adult interaction and social factors in learning. Inevitably there are difficulties associated with the retrospective study of process characteristics of centres and it will be important to examine field notes and pre-school centre histories to establish the extent of change during the study period.

Analytic Strategy

The EPPNI research was designed to enable the linking of three sets of data: information about children's attainment and development (at different points in time), information about children's personal, social and family characteristics (e.g. age, gender, SES etc), and information about pre-school experience (type of centre and its characteristics).

Longitudinal research is essential to enable the impact of child characteristics (personal, social and family) to be disentangled from any influence related to the characteristics of pre-school centre attended. Given the disparate nature of children's pre-school experience it is vital to ensure that the influences of age at assessment, amount and length of pre-school experience and pre-school attendance record are accounted for when estimating the effects of pre-school education. This information is also important in its own right to provide a detailed description of the range of pre-school provision experienced by different children and any differences in the patterns of provision used by specific groups of children/parents and their relationship to parents' labour market participation. Predictor variables for attainment at entry to primary school will include prior attainment (verbal and non-verbal sub scales), social/emotional profiles, and child characteristics (personal, social and family).

The extent to which it is possible to explain (statistically) the variation in children's scores on the various measures assessed at entry to primary school will provide evidence about whether particular forms of pre-school provision have greater benefits in promoting development by the end of the pre-school period. Analyses will test out the impact of measures of pre-school process characteristics, such as the scores on various ECERS scales and pre-school centre structural characteristics such as ratios. This will provide evidence as to which measures are associated with better cognitive and social/behavioural outcomes in children.

Identifying continuing effects of pre-school centres at age 7

Cross-classified multilevel models have been used to examine the long term effects of primary schools on later secondary performance (Goldstein & Sammons, 1997). In the EPPNI research it is planned to use such models to explore the possible mid-term effects of pre-school provision on later progress and attainment at primary school at age 7. The use of cross classified methods explicitly acknowledges that children's educational experiences are complex and that over time different institutions may influence cognitive and social/behavioural development for better or worse. This will allow the relative strength of any continuing effects of pre-school attendance to be ascertained, in comparison with the primary school influence.

The Linked Study in England 1997-2003

The Effective Provision of Pre-school Education (EPPE) project is a linked project and is under the directorship of Professor Kathy Sylva, Professor Edward Melhuish, Professor Pam Sammons, and Professor Iram Siraj-Blatchford. The study explores the characteristics of different kinds of early years provision and examines children's development in pre-school, and influences on their later adjustment and progress at primary school up to age 7 years. It will help to identify the aspects of pre-school provision which have a positive impact on children's attainment, progress, and development, and so provide guidance on good practice. The research involves 141 pre-school centres randomly selected throughout 5 regions of England. The study investigates all main types of pre-school provision attended by 3 to 4 year olds in England: playgroups, private day nurseries, nursery classes, nursery schools, local authority nurseries and combined centres. The data from England and Northern Ireland offer opportunities for potentially useful comparisons.

Summary

The EPPNI project studies the complicated effects of amount and type of pre-school provision experienced by children and their personal, social and family characteristics on subsequent progress and development. Assessment of both cognitive and social/behavioural outcomes are made. The relationships between pre-school characteristics and children's development can be explored. The results of these analyses and the findings from the qualitative case studies of selected centres can inform both policy and practice. Comparisons with the English study (EPPE) can further illuminate the interpretation of results.

EXECUTIVE SUMMARY

The Effective Pre-school Provision in Northern Ireland (EPPNI) project is a longitudinal study that assesses the development of children followed between the ages of 3 and 7 years. Both qualitative and quantitative methods are used to explore the effects of pre-school experience on children's attainment and social/behavioural development at entry to school and up to 7 years of age. In addition to pre-school effects, the study investigates the contribution to children's development of individual and family characteristics such as gender, family size, parental education and employment. A parallel study is being carried out in England (Effective Provision of Pre-school Education - EPPE). The EPPNI and EPPE projects are the first large-scale British studies on the effects of different kinds of pre-school provision relating experience in particular centres and type of centre to child development. The data from England and Northern Ireland offer opportunities for potentially useful comparisons.

The EPPNI and EPPE projects investigate three issues that have important implications for policy and practice:

- the effects on children of different types of pre-school provision,
- the 'structural' (e.g. adult-child ratios) and 'process' characteristics (e.g. interaction styles) of more effective pre-school centres, and
- the interaction between child and family characteristics and the kind of pre-school provision a child experiences.

Over 700 children were recruited from 80 pre-school centres from all Education & Library Boards in Northern Ireland. Children and their families were selected randomly in each centre to participate in the EPPNI Project. In order to examine the impact of no pre-school provision, an additional sample of 150 children without pre-school experience were recruited from the year 1 classes which EPPNI children entered. The progress and development of the children is being followed from age 3 until the end of year 3 of primary school.

One aspect of the EPPNI project is the investigation of the characteristics of pre-school provision, including both 'structural' and 'process' characteristics. A principle method of gaining information is direct observation. One of the most widely used observational measures for describing the characteristics of early childhood education and care is the Early Childhood Environment Rating Scale (ECERS) (Harms, Clifford & Cryer 1998). This scale is used in this study with all the pre-school centres and this report provides the description and results from this stage of the EPPNI project.

Main findings of the ECERS observations

While pre-school centres in Northern Ireland are doing well overall on ECERS, there are big variations between individual centres, with some doing rather poorly. Most subscales of ECERS-R show fair to good scores when averaged across all types of provision. However closer inspection within types of provision reveals some differences. Many centres were found to be exciting places where children were challenged and supported in their learning and with sensitive, responsive interactions

between staff and children. Unfortunately, other centres were characterised by hasty planning and poor implementation of the curriculum. The subscale 'pre-school activities' tended to show the lowest scores. This indicates that differentiated pre-school curriculum activities such as fine motor activities, art, music, movement, sand/water, nature activities, etc. have scope for improvement in pre-school centres in Northern Ireland.

There is less variation between types of centre in Northern Ireland than in England on ECERS-R, and pre-school centres in Northern Ireland score slightly higher overall than comparable centres in England. This is due to the playgroups and the private day nurseries, but particularly the playgroups, scoring more highly on ECERS-R than in England. It is clear that on every subscale playgroups in Northern Ireland score higher than playgroups in England. When private day nurseries in Northern Ireland are compared with those in England, they score higher on 'personal care routines', 'social interaction' and 'parents & staff', but lower on 'pre-school activities'. Nursery classes/schools in Northern Ireland score higher on 'personal care routines', but lower on 'pre-school activities' and 'parents & staff'.

These results reveal the characteristics of pre-school centres based upon observations that relate to 'expert opinion' of good practice with pre-school children. It is an open question as to the degree to which these differences relate to later development for the children (Melhuish, 2000). Later reports will consider whether the differences in ECERS scores for centres are related to developmental progress for children attending those centres.

An analysis of the observational data on pre-school centres in Northern Ireland

Introduction to the Assessment of Pre-school Environments

Researchers have been debating for years about the concept of 'quality' in early childhood education and care. Judgement of quality involves values and what is a 'high quality' centre to one parent may be quite low in the eyes of a local authority officer or indeed another parent. Munton, Mooney and Rowland's (1995) have suggested that there are six dimensions of quality: effectiveness, acceptability, efficiency, access, equity and relevance. The main thrust of the EPPE and EPPNI studies is on the 'effectiveness' aspect of quality as defined by Munton and his colleagues. Munton et al. (1995) further identified three basic dimensions in describing the early years setting. These are the **structure** which includes both facilities and human resources; the educational and care **processes** which children experience every day; and the **outcomes** or the longer term consequences of the education and care the child receives. The observational measures described in this technical paper focus on educational and care processes but also include some structure in their description of quality.

One of the most widely used observational measures for describing the characteristics of early childhood education and care is the **Early Childhood Environment Rating Scale** (ECERS, now revised; Harms, Clifford & Cryer 1998). The difference between ECERS and its revised form ECERS-R is that improvements have been made as a result of over ten years of experience using ECERS. These improvements have been in terms of removing ambiguities and making scoring easier. The essential dimensions measured remain the same. The revised ECERS-R has 43 items which are divided into 7 sub-scales. These sub-scales are space and furnishing, personal care routines, language and reasoning, activities, social interactions, organisation and routines, adults working together. Each item is rated on a 7 point scale (1 = inadequate, 3 = minimal/adequate, 5 = good, 7 = excellent). Completion of the ECERS usually involves approximately one day of observation, as well as talking to the staff about aspects of the routine which were not visible during the observation session (for example, weekly swimming or seasonal outings). The word 'environment' in the rating scale is taken in its broadest sense to include social interactions, pedagogical strategies and relationships between children as well as adults and children. Matters of pedagogy are very much to the fore in ECERS-R. For example the sub-scale Organisation and Routine has an item 'Schedule' which gives high ratings to a balance between adult-initiated and child-initiated activities. In order to score a 5 the centre must have 'a balance between structure and flexibility' but a 7 requires 'variations to be made in the schedule to meet individual needs, for example a child working intensively on a project should be allowed to continue past the scheduled time'. Further attention to pedagogy can be found in the item Free Play where to earn a 5 centres must have 'free play occurring for a substantial portion of the day/session both indoors and outdoors' Although entitled 'Environmental Rating Scale' the ECERS-R describes processes of the educational and care environment even more than the physical space and materials on offer.

Construct validity for the original ECERS has been demonstrated in previous studies through its agreement with professional judgements and predictive validity through the results of child outcome measures applied to the 'graduates' of higher or lower quality provision. Discriminant validity has been based on the ability of the items to

distinguish between classrooms of varying quality which were assessed by trainers/experts. Reliability has been established in many studies carried out elsewhere on the ECERS and in general Kappa inter-rater agreement varies between .75 and .95.

In the EPPNI study, the ECERS-R was supplemented by a new rating scale (ECERS-Extension, Sylva, Siraj-Blatchford, Taggart and Colman, 1998), based on the Desirable Learning Outcomes used in England for 3 and 4 year-olds and pedagogical practices associated with it (Siraj-Blatchford and Wong, 1999). Both the ECERS-R and ECERS-E are based on a conceptual framework which takes account of pedagogical processes and curriculum.

ECERS was developed in the United States of America and intended for use in both care and educational settings. The team thought it necessary to use a second early childhood environment rating scale which focused on British provision as well as catering for diversity (Sylva et al., 1998). The ECERS-E was devised after wide consultation with experts and piloted extensively. The ECERS-E consists of 4 subscales: literacy, mathematics, science and environment, and diversity. Both the ECERS-R and the ECERS-E will be described as they were applied in 80 pre-school settings across Northern Ireland.

Both ECERS ratings were carried out by a senior research officer. The research officers had experience of assessing children for at least 6 months in the centre before the ECERS observation and ratings. Moreover, each observer put aside a full day for the ECERS. This was necessary because the scales contained very detailed information about curricular provision, pedagogy, planning, resources and relationships.

Governmental Guidance for pre-school practice: Northern Ireland and England

In Northern Ireland government departments have produced guidance for staff working in pre-school settings. In comparing the two documents DfEE (1999) Early Learning Goals and the Northern Ireland CCEA (1997) Curricular Guidance for Pre-School Education, several similarities are obvious. Both publications embody support for the pre-school stage of education and each addresses similar though not identical aspects of the curriculum. It should be recognised that children in England and Wales start school after their fifth birthday while for children in Northern Ireland who are four on the first of July, statutory schooling begins in September of that year. Whilst acknowledging that expectations from this stage of education may differ because of the disparity in the ages of the respective children, a more significant distinction is apparent.

The dissimilarity would seem to stem from a difference in the philosophy of approach which informs the two documents. This is perhaps most clearly embodied in the opening statement of the Curricular Guidance for Pre – School Education (1997), which places the development of the guidance firmly in the tradition of the (1989) Northern Ireland Nursery Education Guidelines “The Curriculum”;

“There is no place at this stage for the introduction of formal schooling in the sense of an established body of knowledge to be acquired or a set of skills to be mastered” (P.7).

In contrast the Early Learning Goals (1999) documentation is very clear about the types of skills in which the children should be competent by the end of the Foundation Stage.

In effect, a process versus a product approach would appear to be the distinguishing feature of the differences between the two sets of pre – school guidance. For instance, the N.I. CCEA guidance affirms that desired learning will result from an appropriate curriculum and that while children inevitably differ in their rates of progress each individual is entitled to a curriculum which would enable her or him to make appropriate progress. In actual physical terms, substantially more space in this paper is devoted to describing the types of enriching activities to be experienced by the children, than is devoted to outlining the evidence of learning or assessment criteria to be applied. There is a confidence that children will develop competence in skills and attitudes and will for the most part display behaviour that evidences these if they experience an appropriately stimulating and adult supported learning environment. On the other hand, the Early Learning Goals claim that,

“Monitoring of individual children’s progress throughout the foundation stage is essential to ensure that all are making progress and that particular difficulties in any of the areas of learning, whatever the cause, are identified and addressed.” (p. 9)

In fact, the issue of assessment significantly highlights the divergence of methods that is presented by the two documents. For example, the CCEA guidance refers to the curriculum in terms of mathematical experiences which will result in children using mathematical language in relevant contexts and beginning to understand early concepts of size and quantity (p.19). In contrast to this, the Early Learning Goals (1999) in tune with the terminology of its title, has definite goals or products in mind and delineates these outcomes in very specific terms, for example:

‘count reliably up to 10 everyday objects;
recognise numerals up to 10.’ (p.31)

This product oriented approach is again in evidence when we compare the Early Learning Goals with the Curricular Guidance in relation to ‘Language and Literacy’ and ‘Language’ sections in the respective documents. The former stipulates that most children will be able to amongst a list of 19 goals:

‘hear and say initial and final sounds in words, and short vowel sounds within words; link sounds to letters, naming and sounding the letters of the alphabet; read a range of familiar and common words and simple sentences independently; use their phonic knowledge to write simple regular words and name phonetically plausible attempts at more complex words’ (p. 19).

The latter is content to ensure progress through elaborating on learning processes such as

‘children enjoy and share books with each other and engage in role play; as a result of which they will express thoughts , ideas and feeling with increasing confidence and fluency; and will listen and respond to stories, nursery rhymes, poems, jingles and songs. ‘(p.18)

The nature of the disparities between the respective pre-school support documents DfEE (1999) Early Learning Goals and the CCEA (1997) Curricular Guidance for Pre-School Education, results in a different curricular experience for the respective children involved. As a result, pre-school centres in Northern Ireland might be expected to have lower scores on the ECERS –E, (3 curricular subscales), since these are in part a skill oriented measure, than pre-school centres in England.

Method

Sample

The pre-school centres in the study are shown in Table 1.

Table 1. Pre-school sample for main analysis

Type of provision	N
Nursery Classes/School	16
Playgroups	15
Private day nurseries	19
Reception Classes/	9
Reception Group	21
Total	80

Rating Scales: the Early Childhood Environment Rating Scale (ECERS-R) and the English Extension (ECERS-E)

Each pre-school centre was assessed using the ECERS-R and its extension. The ECERS-R consists of 7 sub-scales; each sub-scale is composed of 4-10 individual items which describe the 'quality' of provision along a continuum centred on materials, facilities, pedagogy or social interactions. The ECERS-R sub-scales are listed below with their titles and items. In this study the wording of the ECERS-R was adjusted slightly to conform to U.K. language use. Minor changes to sub-scale titles were made (shown in brackets).

Space and furnishings – items 1-8

Personal care routines (Personal care practices) – items 9-14

Language and reasoning – items 15-18

Activities (Pre-school activities) – items 19-28

Interaction (Social interaction) – items 29-33

Programme structure (Organisation and routines) – items 34-37

Parents and staffing (Adults working together) – items 38-43

The ECERS-E consists of 4 sub-scales:

Literacy – items 1-6

Mathematics – items 7-10

Science and environment – items 11-13

Diversity – items 14-16

The structure of the two environmental scales is presented on the following pages.

Procedure

All 80 centres involved in the EPPNI study were rated on the ECERS-R and ECERS-E rating scales by a regional Research Officer. Completion of the ECERS involved one day of observation as well as talking to the staff about aspects of the routine which were not visible during the observation session (for example, weekly swimming or seasonal outings).

Structure of the Environmental Rating Scale

<p>I. Space and furnishings</p> <ol style="list-style-type: none"> 1. Indoor space 2. Furniture for routine care, play and learning 3. Furnishings for relaxation and comfort 4. Room arrangement for play 5. Space for privacy 6. Child related display 7. Space for gross motor 8. Gross motor equipment <p>II. Personal care practices</p> <ol style="list-style-type: none"> 9. Greeting/departing 10. Meals/snacks 11. Nap/rest 12. Toileting/diapering 13. Health practices 14. Safety practice 	<p>III. Language and reasoning</p> <ol style="list-style-type: none"> 15. Books and pictures 16. Encouraging children to communicate 17. Using language to develop reasoning skills 18. Informal use of language <p>IV. Pre-school activities</p> <ol style="list-style-type: none"> 19. Fine motor 20. Art 21. Music/movement 22. Blocks 23. Sand/water 24. Dramatic play 25. Nature/science 26. Math/number 27. Use of TV, video, and/or computers 28. Promoting acceptance of diversity 	<p>V. Social interaction</p> <ol style="list-style-type: none"> 29. Supervision of gross motor activities 30. General supervision of children (other than gross motor) 31. Discipline 32. Staff-child interactions 33. Interactions among children <p>VI. Organisation and routines</p> <ol style="list-style-type: none"> 34. Schedule 35. Free play (free choice) 36. Group time 37. Provisions for children with disabilities <p>VII. Adults working together</p> <ol style="list-style-type: none"> 38. Provisions for parents 39. Provisions for personal needs of staff 40. Provisions for professional needs of staff 41. Staff interaction and co-operation 42. Supervision and evaluation of staff 43. Opportunities for professional growth
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(Harms, T., Clifford, M. & Cryer, D., 1998)

Ratings are to be assigned in the following way, taking into account exact indicators for each item (see Appendix X):

- A score of 1 must be given if any indicator under 1 is scored “Yes”.
 - A rating of 2 is given when all indicators under 1 are scored “No” and at least half of the indicators under 3 are scored “Yes”.
 - A rating of 3 is given when all indicators under 1 are scored “No” and all indicators under 3 are scored “Yes”.
 - A rating of 4 is given when all requirements for 3 are met and at least half of the indicators under 5 are scored “Yes”.
 - A rating of 5 is given when all requirements for a 3 are met and all indicators under 5 are scored “Yes”.
 - A rating of 6 is given when all requirements for 5 are met and at least half of the indicators under 7 are scored “Yes”.
 - A rating of 7 is given when all requirements for a 5 are met and all indicators under 7 are scored “Yes”.
 - A score of NA (Not Applicable) may only be given for indicators or for entire items when permitted as shown on the scoresheet. Indicators scored NA are not counted in determining the rating for an item. Items scored NA are not counted in calculating subscale and total scale scores.
- Harms, T., Clifford, M. & Cryer, D. (1998)

Structure of the Environmental Rating Scale – Extension

I. Literacy	II. Mathematics	III. Science and Environment	IV. Diversity
1. ‘Environmental print’: Letters and words 2. Book and literacy areas 3. Adult reading with the children 4. Sounds in words 5. Emergent writing/mark making 6. Talking and Listening	7. Counting and the application of counting 8. Reading and writing simple numbers 9a. Mathematical Activities: Shape and space (select either 9a or 9b for evidence; choose the one which you observed most) 9b. Mathematical Activities: Sorting, matching and comparing	10. Natural materials 11. Areas featuring science/science resources 12a. Science Activities: Science processes: Non Living (select one of a, b, c for evidence; choose one you observed most) 12b. Science Activities: Science processes: Living processes and the world around us 12c. Science Activities: Science processes: Food preparation	13. Individual learning needs 14. Gender equity 15. Multicultural Education
<i>(Sylva, K., Siraj-Blatchford, I., Taggart, B., & Colman, P., 1998)</i>			

Ratings are to be assigned in the following way, taking into account exact indicators for each item (see Appendix X):

- A score of 1 must be given if any indicator under 1 is scored “Yes”.
- A rating of 2 is given when all indicators under 1 are scored “No” and at least half of the indicators under 3 are scored “Yes”.
- A rating of 3 is given when all indicators under 1 are scored “No” and all indicators under 3 are scored “Yes”.
- A rating of 4 is given when all requirements for 3 are met and at least half of the indicators under 5 are scored “Yes”.
- A rating of 5 is given when all requirements for a 3 are met and all indicators under 5 are scored “Yes”.
- A rating of 6 is given when all requirements for 5 are met and at least half of the indicators under 7 are scored “Yes”.
- A rating of 7 is given when all requirements for a 5 are met and all indicators under 7 are scored “Yes”.
- A score of NA (Not Applicable) may only be given for indicators or for entire items when permitted as shown on the scoresheet.

Indicators which are scored NA are not counted when determining the rating for an item. Items scored NA are not counted when calculating subscale and total scale scores.

Occasionally centre records were consulted as evidence for rating an item. There were a number of items in the ECERS-R and ECERS-E which were not relevant for the centres in this sample, e.g. provision for 'nap/rest' was only considered to be relevant in 20 out of the 80 centres. Where items were not appropriate the item was excluded from further analysis, i.e. sub-scale scores were calculated from only the items which were scored/relevant. Inter-observer reliability was established to be of a high standard.

Inter-observer reliability

Before using observational rating scales in research it is necessary to establish inter-observer agreement. Good levels of agreement depend on a sound choice of instruments and good researcher training. EPPNI observers spent many days in each centre before formal observation began. All research officers were trained extensively on the observational instruments and a research officer from Cardiff University acted as the 'standard' in a reliability exercise. In each Education and Library Board five centres were observed by the regional research officer and the person acting as 'standard'. Each centre was observed and rated over the course of a whole day. At the end of the day the two observers who had independently scored the ECERS-R and ECERS-E compared their scores on the same observations. Hence reliability was established for two instruments in 25 centres chosen randomly throughout the regions.

The reliability for each pair of observers was computed on the basis of:

- a) where each observer scored exactly the same point on a scale (% exact agreement)
- b) a Kappa value was computed. Kappa is a statistic which measures the degree of agreement between two observers while allowing for the level of 'chance' agreement. The Kappa statistic is computed by the following formula:

$$\text{Kappa} = \frac{R_o - R_c}{1 - R_c}$$

where R_o = proportion agreement observed

R_c = proportion agreement that would occur by chance

Kappas of 0.50 and higher are considered acceptable

The reliability figures for EPPNI were Kappas 0.81 to 0.91 These figures are comparable with reliability figures in other studies using ECERS and indicate good quality observational data in this study.

Results

A score for each sub-scale was calculated for the ECERS-R and the ECERS-E using the following equation:

$$\text{Sub-scale score} = \frac{\text{Sum of scores for each (applicable) item in the sub-scale}}{\text{Number of items scored}}$$

Total ECERS-R and ECERS-E scores were then calculated by summing the mean sub-scale scores (7 and 4 sub-scales respectively). Only relevant items (i.e. those that were rated) were used in the calculation of sub-scale scores, thus non-relevant items had no effect on the results.

Distribution of scores and an overview of the sub-scales

The total ECERS-R and total ECERS-E scores were approximately normally distributed (see Figures 1 and 2 respectively) and met parametric assumptions. Analysis of Variance (ANOVA) tests with Tukey's HSD post hoc tests were employed to compare differences between types of centres for total ECERS-R and ECERS-E scores. Furthermore, with some exceptions, the mean sub-scale scores were normally distributed and therefore ANOVA and Tukey's HSD tests were also employed in the analysis of the sub-scales. When the parametric assumptions were not satisfied, Kruskal-Wallis tests were used, and Mann-Whitney tests were used to test the significance of pair-wise comparisons.

Figure 1. Histogram of total ECERS-R scores

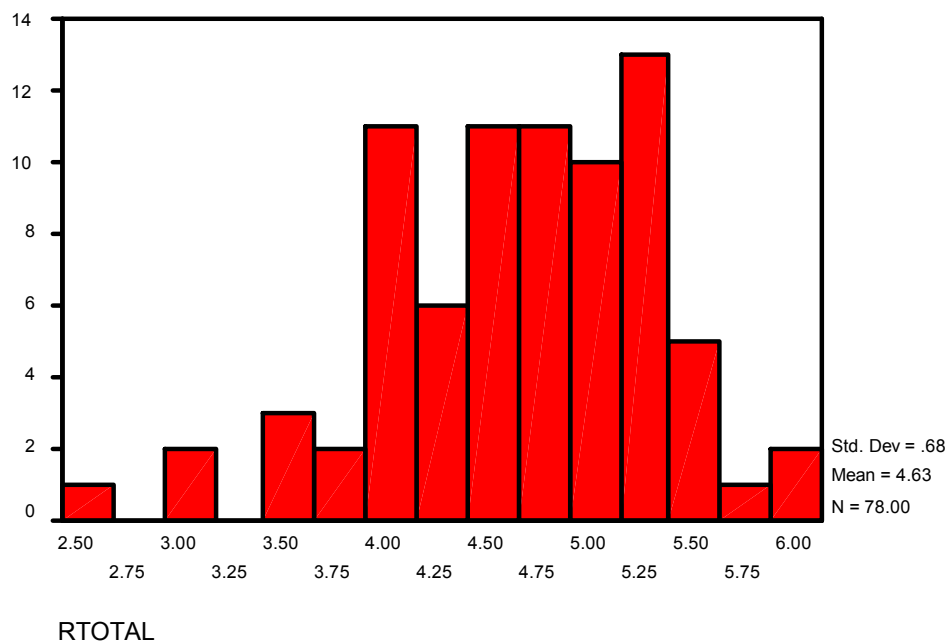
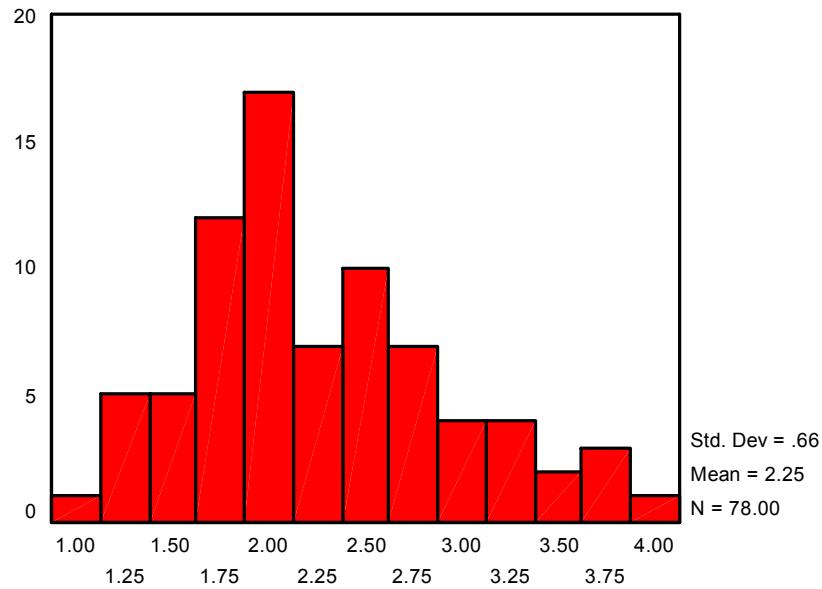


Figure 2. Histogram of total ECERS-E scores



ETOTAL

Figure 3 shows the means for the ECERS-R and the new scale based on the English Desirable Learning Outcomes, ECERS-E. The ECERS-R scores tend towards the top of the 'adequate' range and sometimes approach 'good'. The ECERS-E scores are much lower with provision for mathematics, science and diversity near 'minimal' ratings reflecting the absence of Desirable Learning Outcomes in Northern Ireland. These means are not weighted by proportion of children attending each type of provision.

Figure 3. Mean ECERS-R and ECERS-E scores

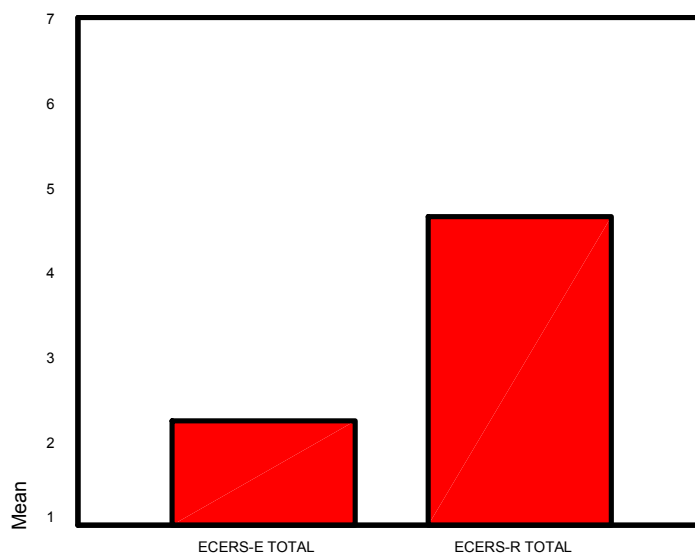


Figure 4 breaks down the two scales into their sub-scale components. The highest scores are found in 'social interactions', 'personal care' 'space and furnishings' and 'language' while the lowest scores are seen in 'pre-school activities' and the ECERS-E scales 'literacy' 'diversity' 'mathematics' and 'science and environment'. The low scores for ECERS-E scales are to be expected because these scales are based on the English Desirable Learning Outcomes (DLO's) which are not in operation in Northern Ireland. Hence, while the ECERS-E scales have a 'curiosity value', they are given a low priority and are included only as a 'minimal additional cost' item. The consideration of 'quality' of pre-school provision for this study is based primarily upon ECERS-R. Although the ratings averaged across all types of provision are broadly satisfactory, closer inspection within types of provision reveals some differences. In this sample many centres were found to be exciting places where children were challenged and supported in their learning and where the interactions between staff and children were sensitive and enabling. Unfortunately, other centres were characterised by hasty planning and poor implementation of the curriculum.

Figures 5 to 11 reveal the pattern of subscale scores by type of pre-school, in Northern Ireland. Note that in these figures the term 'nursery class' refers to 'nursery class or nursery school'. Beside each figure an indication of the items within the subscale is given.

Figure 4. ECERS-R and ECERS-E sub-scale score

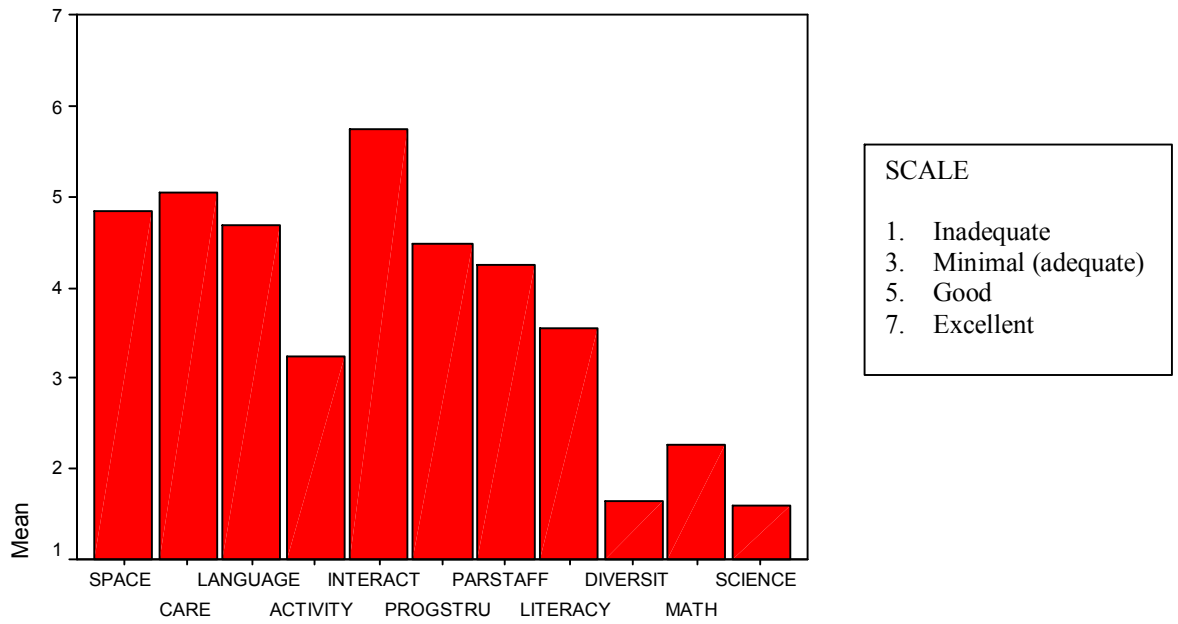


Figure 5. Space and furnishings by pre-school type

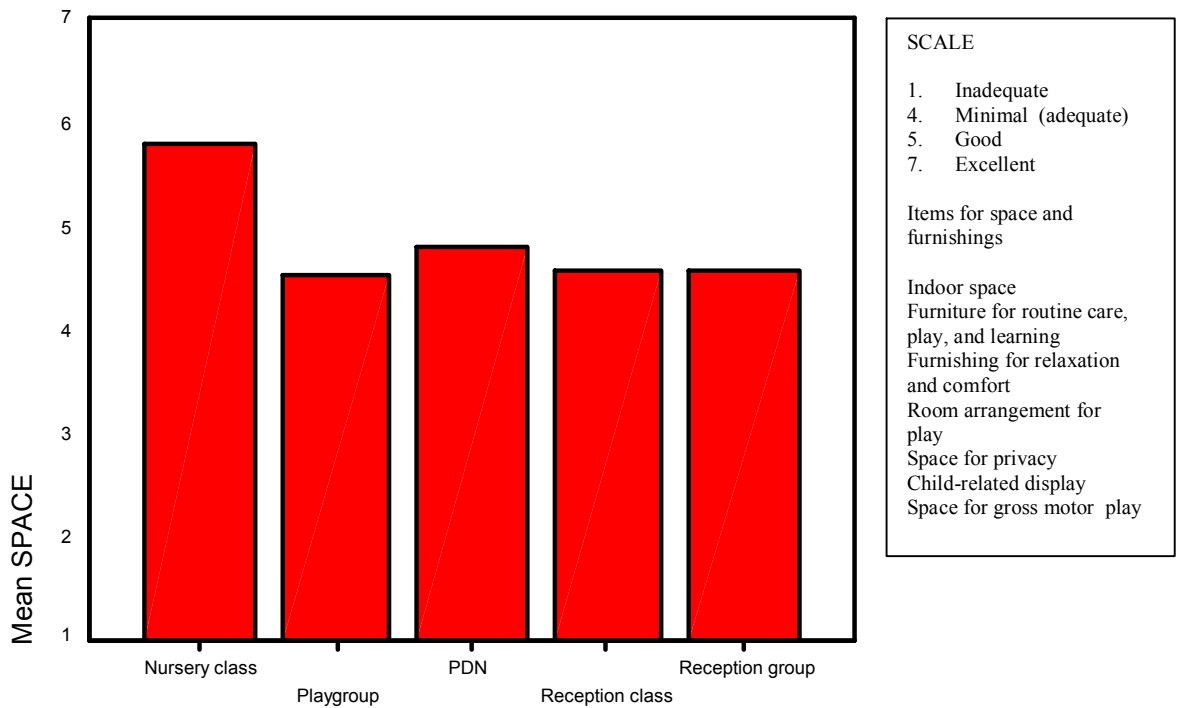


Figure 6. Personal care practices by pre-school type

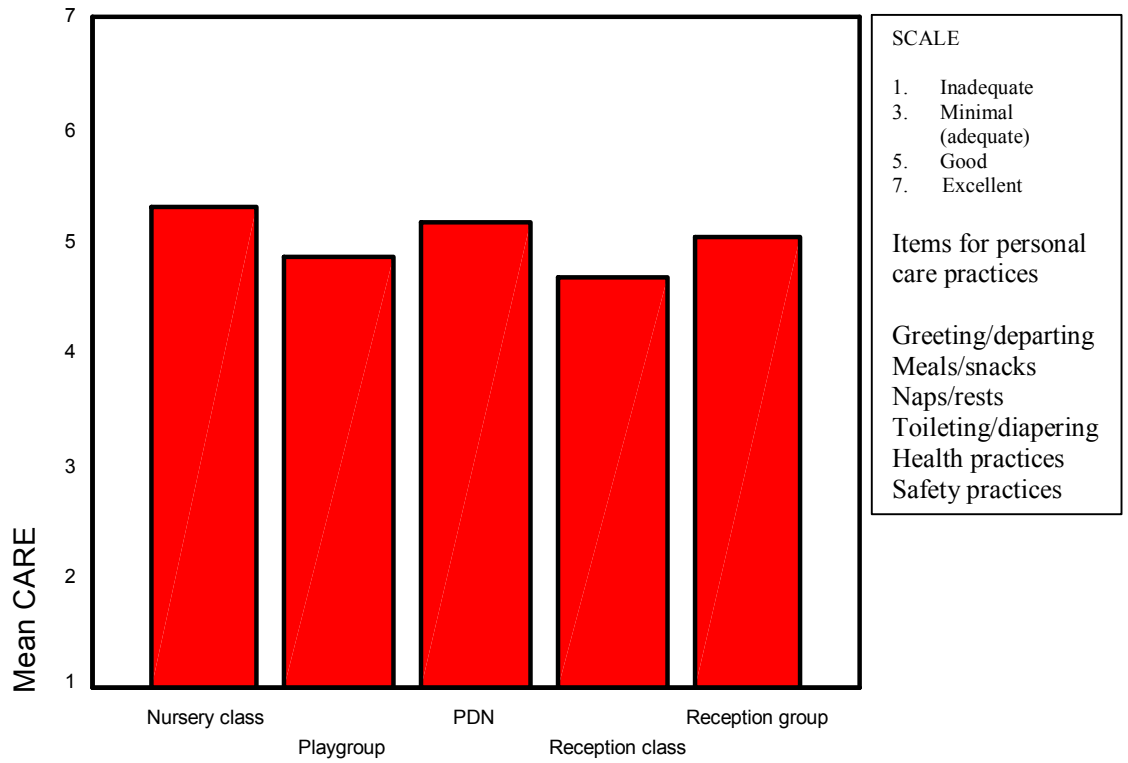


Figure 7. Language reasoning by pre-school type

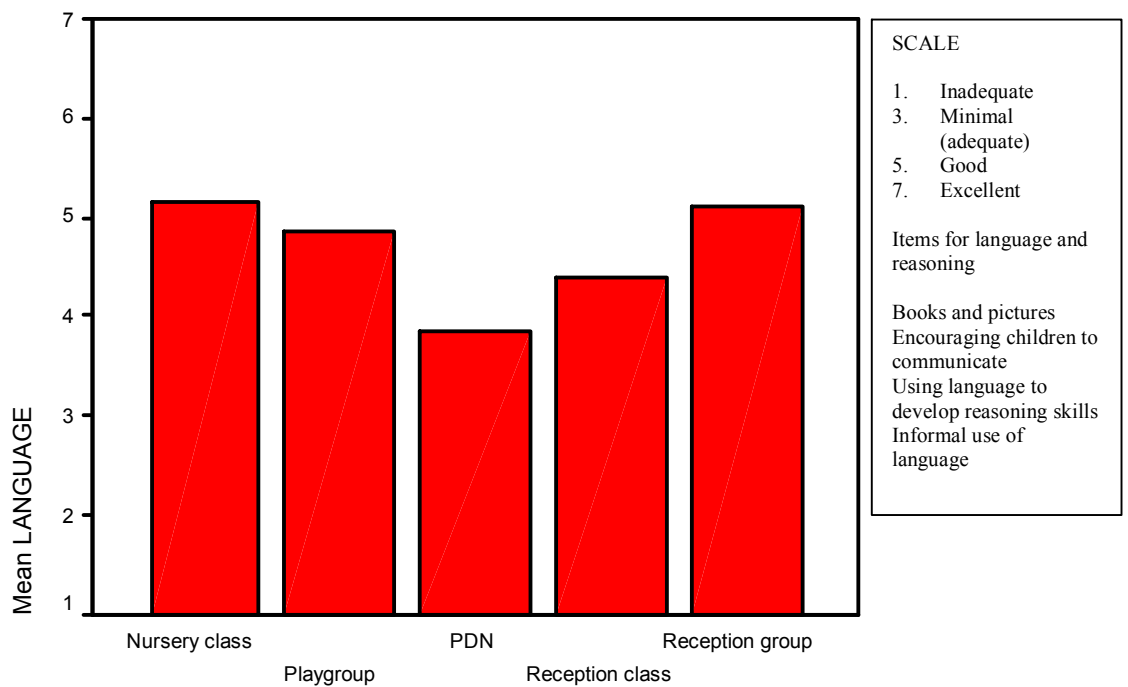


Figure 8. Pre-school activities by pre-school type

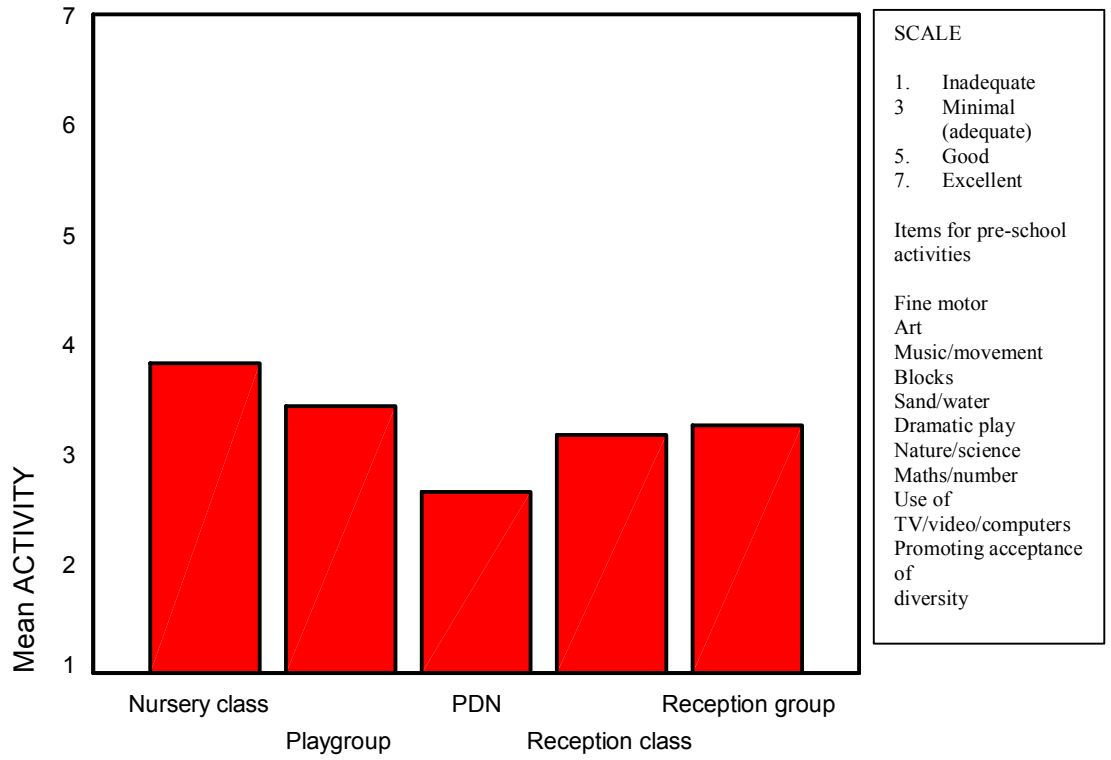


Figure 9. Social interaction by pre-school type

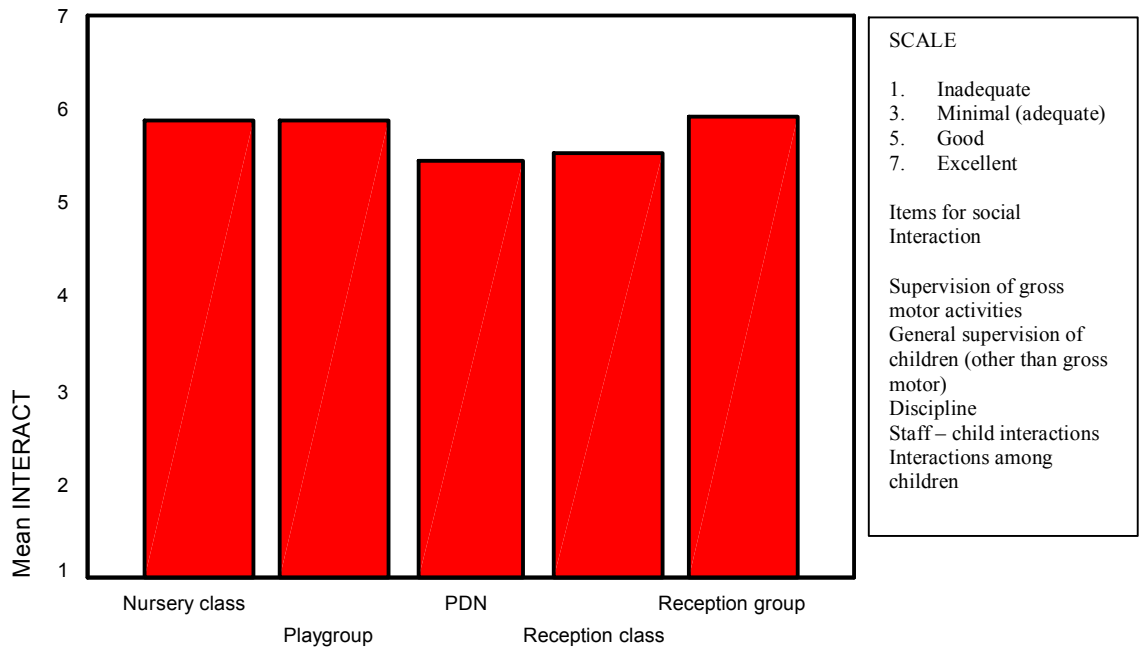


Figure 10. Organisation and routines by pre-school type

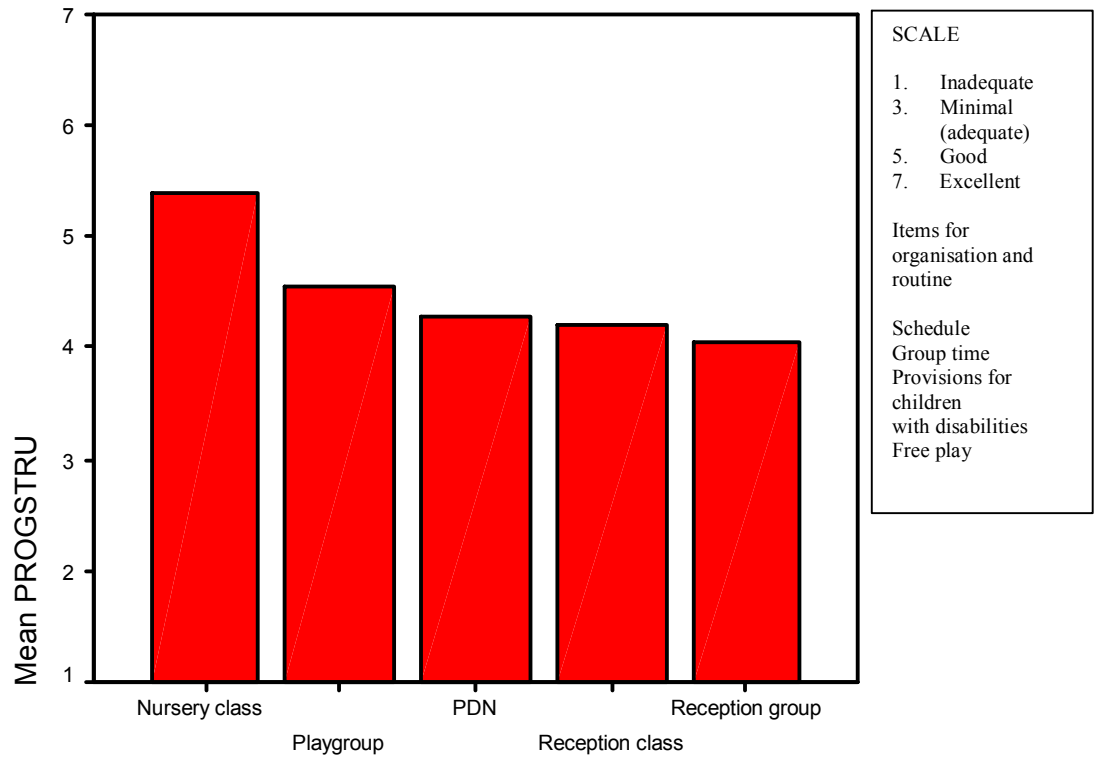
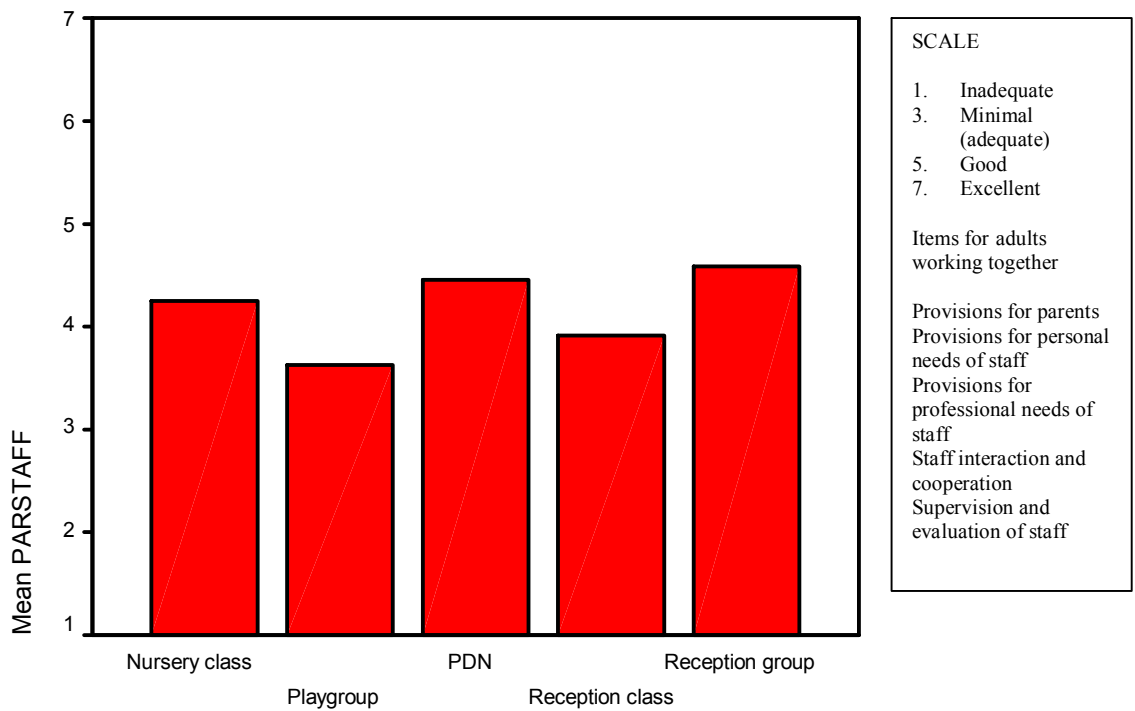


Figure 11. Adults working together by pre-school type



The total ECERS-R score averages near the good level overall, but this overall score obscures considerable variation for subscale scores. With regard to the separate subscale scores, the high level of scoring across all pre-school centres for 'social interaction' is noteworthy. This indicates a very good level of interaction between staff and children and amongst children generally. The subscales, 'space and furnishings', 'personal care', 'language', and 'organisation and routines' are overall at fair to good levels. The subscale 'adults working together' overall is fair reflecting scope for better provision for staff and parents. The worst subscale is 'pre-school activities' which is only at the minimally adequate level, with some pre-school centres being below adequate. This indicates that differentiated pre-school curriculum activities such as fine motor activities, art, music, movement, sand/water, nature activities, etc. have plenty of scope for improvement across the board.

The differences between types of centres were tested for statistical significance. For the total ECERS-R scores, the only statistically significant difference was that nursery classes/schools scored higher than private day nurseries. For separate subscales, 'personal care', 'social interaction' and 'organisation and routines' there were not significant differences across the types of pre-school. For 'space and furnishings' nursery classes/schools scored higher than all the other types of pre-school. For 'language' and 'pre-school activities' private day nurseries scored lower than all other types of pre-school. For 'adults working together' both private day nurseries and reception groups scored significantly higher than playgroups. The means and standard deviations for ECERS scores broken down by type of pre-school are given in Appendix 1.

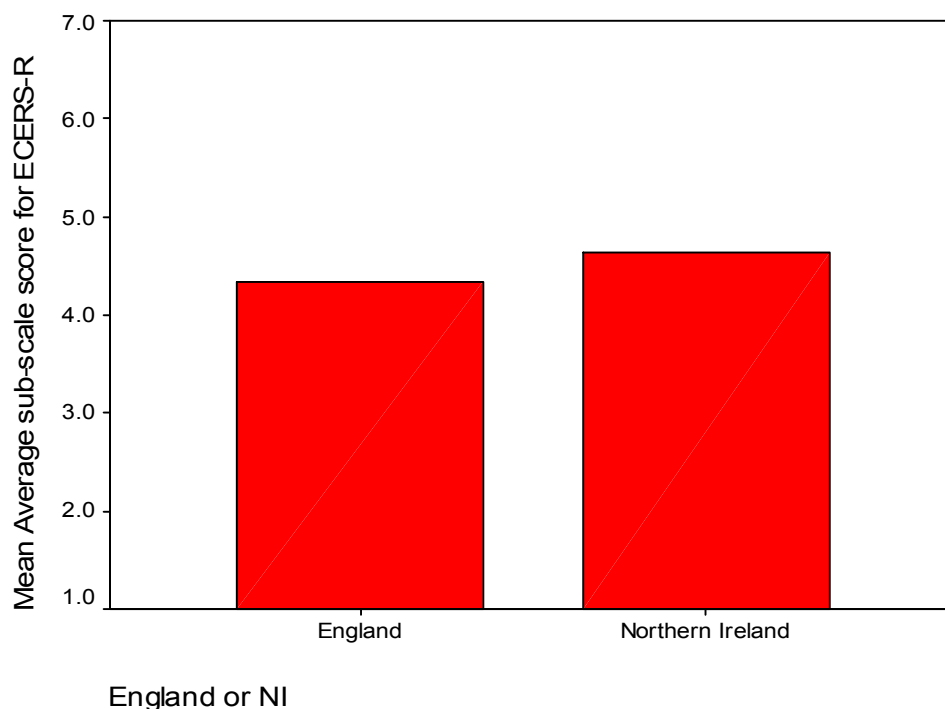
Comparison of pre-school centres in Northern Ireland and England.

As the ECERS scales were applied in similar fashion with pre-school centres in Northern Ireland (EPPNI) and in England (EPPE), comparison of the data sets between EPPNI and EPPE allows differences between pre-school centres in Northern Ireland and England to be explored.

ECERS-R

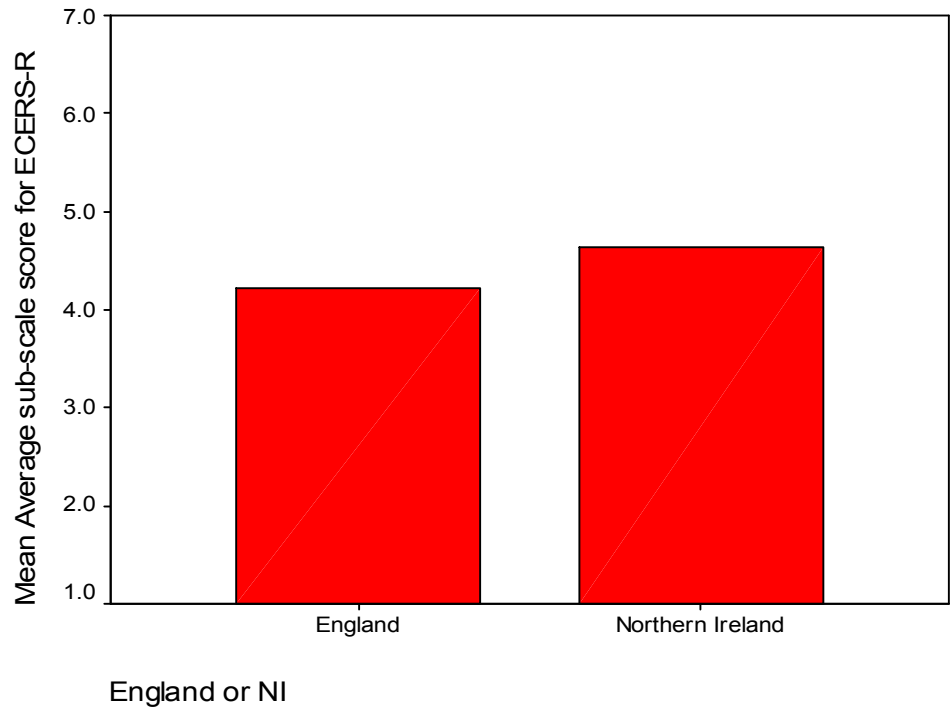
On the basis of the overall ECERS-R scores, Northern Ireland centres are scoring slightly higher than the centres in England (see Figure 12).

Figure 12: ECERS-R total score for all centres in England and Northern Ireland



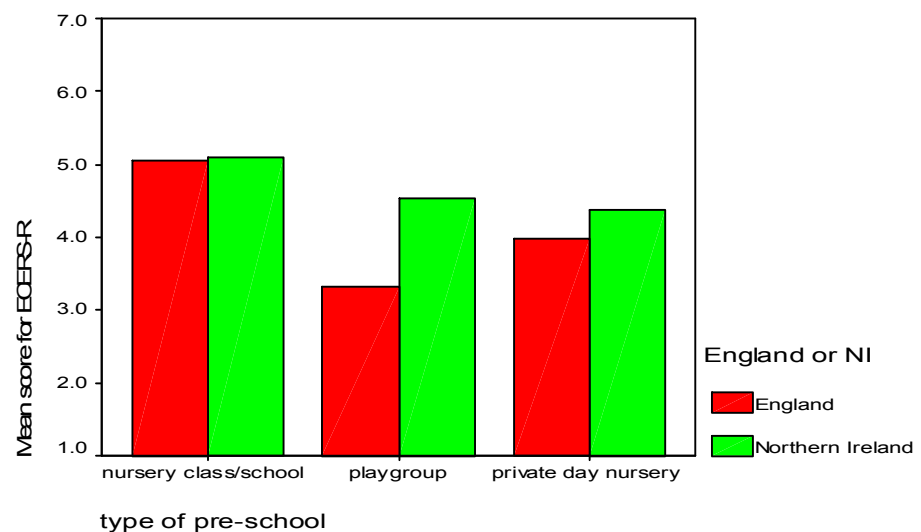
It could be that this difference in ECERS-R scores is because of the different types of centres in EPPNI and EPPE. However if the comparison is restricted to those types of centre which common to both studies, i.e. nursery classes/schools, playgroups and private day nurseries, a similar pattern emerges, (see Figure 13).

Figure 13: ECERS-R for common centres in England and Northern Ireland



The differences between the countries can be examined by the type of pre-school as in Figure 14. In looking at the separate types of pre-school, the reasons for the differences in ECERS-R total scores can be seen clearly. The overall higher scores in Northern Ireland are due to the higher scores of playgroups and private day nurseries in Northern Ireland. Whereas nursery classes/schools score almost exactly equivalently in the two countries. Playgroups, in particular, scored very much higher in ECERS-R in Northern Ireland than in England.

Figure 14: ECERS- by type of centre in England and Northern Ireland



When the ECERS-R subscale scores between England and Northern Ireland for common types of pre-school centre (nursery class/school, playgroups and private day nurseries) are compared, the differences in Table 2 are revealed. The subscales ‘personal care’ and ‘social interaction’ are significantly higher in Northern Ireland centres, but the subscale ‘pre-school activities’ is significantly higher in England centres. Other subscales do not reveal statistically significant differences.

Table 2: Comparing England and Northern Ireland on ECERS-R subscale scores.

ECERS-R subscale	England		Northern Ireland		Significance of difference between means (independent t-test)
	Mean	<i>s.d.</i>	mean	<i>s.d.</i>	
Space & furnishing	4.67	1.07	5.01	0.97	Not sig.
Personal care routines	3.69	1.40	5.11	1.21	p< .001
Language & reasoning	4.34	1.42	4.56	1.26	Not sig.
Pre-school activities	3.73	1.19	3.25	0.81	p< .005
Social interaction	4.73	1.33	5.71	0.99	p< .001
Programme structure	4.49	1.48	4.71	1.53	Not sig.
Parents & staff facilities	3.86	1.30	4.14	0.81	Not sig.

When the ECERS-R subscales are compared separately for each of the types of pre-school centre (nursery class/school, playgroups and private day nurseries), a slightly more complex situation emerges (independent t-tests). Firstly and most dramatically, it is clear that on every subscale playgroups in Northern Ireland score significantly higher than playgroups in England. When private day nurseries in Northern Ireland are compared with those in England, they score significantly higher on ‘personal care routines’, ‘social interaction’ and ‘parents & staff’, but significantly lower on ‘pre-school activities’. Nursery classes/schools in Northern Ireland score significantly higher on ‘personal care routines’, but significantly lower on ‘pre-school activities’ and ‘parents & staff’.

The pre-school centres in Northern Ireland are doing well overall on ECERS-R. Although there are big variations between individual centres, with some doing rather poorly. There is less variation between types of centre in Northern Ireland than in England on ECERS-R. This is due to the playgroups and the private day nurseries, but particularly the playgroups, scoring more highly on ECERS-R than in England.

Later stages of the project will consider whether the differences in ECERS scores for centres are related to developmental progress for children attending those centres.

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Table: 1 ECERS subscale scores by type of pre-school centre in Northern Ireland

ECERS subscale	Nursery class/school		Playgroup		Private day nursery		Reception class		Reception group	
	mean	<i>s.d.</i>	mean	<i>s.d.</i>	mean	<i>s.d.</i>	mean	<i>s.d.</i>	mean	<i>s.d.</i>
ECERS-R										
Space & furnishing	5.76	<i>0.72</i>	4.52	<i>0.86</i>	4.74	<i>0.86</i>	4.58	<i>0.65</i>	4.56	<i>0.76</i>
Personal care routines	5.35	<i>1.18</i>	4.87	<i>1.38</i>	5.12	<i>1.11</i>	4.69	<i>1.47</i>	5.01	<i>1.22</i>
Language & reasoning	5.17	<i>0.92</i>	4.87	<i>1.39</i>	3.75	<i>1.01</i>	4.42	<i>1.16</i>	5.13	<i>0.92</i>
Pre-school activities	3.82	<i>0.52</i>	3.42	<i>0.62</i>	2.61	<i>0.73</i>	3.19	<i>0.51</i>	3.26	<i>0.44</i>
Social interaction	5.95	<i>1.03</i>	5.87	<i>0.68</i>	5.38	<i>1.12</i>	5.53	<i>1.54</i>	5.91	<i>0.39</i>
Programme structure	5.38	<i>1.41</i>	4.56	<i>1.31</i>	4.24	<i>1.66</i>	4.21	<i>1.05</i>	4.05	<i>1.08</i>
Parents & staff facilities	4.12	<i>0.91</i>	3.63	<i>0.77</i>	4.54	<i>0.48</i>	3.90	<i>1.42</i>	4.59	<i>0.59</i>
ECERS-R total	5.09	<i>0.61</i>	4.53	<i>0.86</i>	4.34	<i>0.76</i>	4.36	<i>0.64</i>	4.64	<i>0.37</i>
ECERS-E										
Literacy	3.56	<i>0.92</i>	3.51	<i>0.79</i>	2.94	<i>0.88</i>	3.70	<i>0.65</i>	3.98	<i>0.86</i>
Maths	1.79	<i>1.03</i>	2.02	<i>1.02</i>	1.51	<i>0.68</i>	2.67	<i>1.52</i>	3.20	<i>1.49</i>
Science & environment	2.23	<i>1.10</i>	1.51	<i>0.62</i>	1.09	<i>0.22</i>	1.29	<i>0.35</i>	1.75	<i>0.81</i>
Diversity	2.02	<i>0.74</i>	1.56	<i>0.75</i>	1.33	<i>0.60</i>	1.48	<i>0.58</i>	1.73	<i>0.61</i>
ECERS-E total	2.40	<i>0.54</i>	2.15	<i>0.60</i>	1.72	<i>0.45</i>	2.29	<i>0.52</i>	2.66	<i>0.69</i>

Appendix 2: The use of ECERS-E scales in Northern Ireland

The ECERS-E scale was devised to measure aspects of children's experience related to the English Desirable Learning Outcomes (DLO's), and hence the applicability in Northern Ireland is questionable. As these DLO's are not in operation in Northern Ireland, it is not surprising that pre-school centres did not make provision for children to have experiences related to the DLO's. The scales were included in the project as they were a 'minimal cost' addition to the observational data collection, and it might be useful for future development planning to know how Northern Ireland pre-school centres perform on these aspects currently. Overall the scores on the curriculum areas of 'literacy' 'diversity', 'mathematics' and 'sciences' are very low. The scores on the 'literacy' subscale are best (see figure 12) and are generally above the adequate level. However on the other three subscales pre-school centres almost always scored at a lower level. Throughout it should be borne in mind that the applicability of ECERS-E to Northern Ireland is limited as the curriculum issues raised by the Desirable Learning Outcomes in England do not apply in Northern Ireland as they do in England.

Figure 15: Total ECERS-E scores by pre-school type

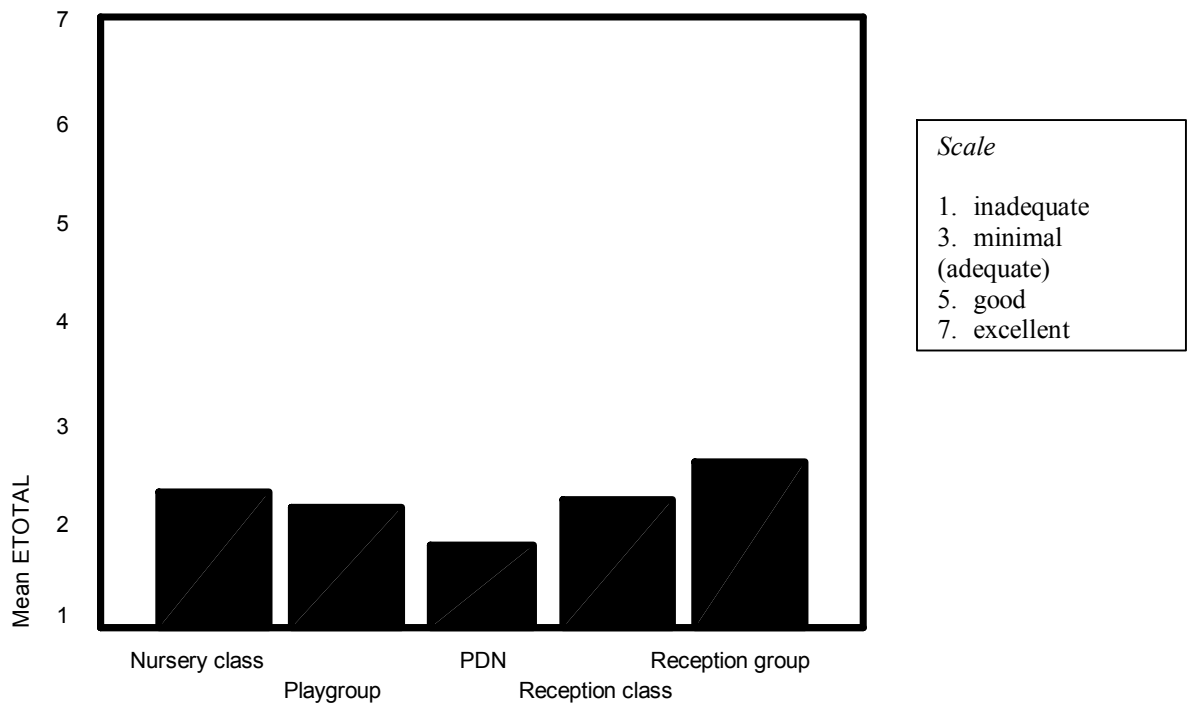


Figure 16:
Literacy by pre-school type

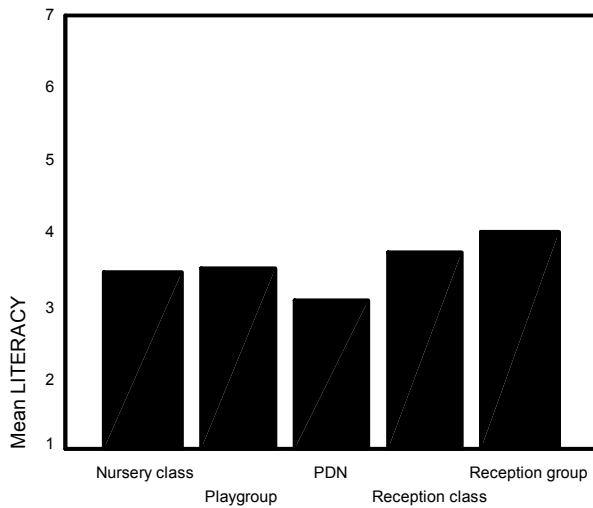


Figure 17:
Mathematics by pre-school type

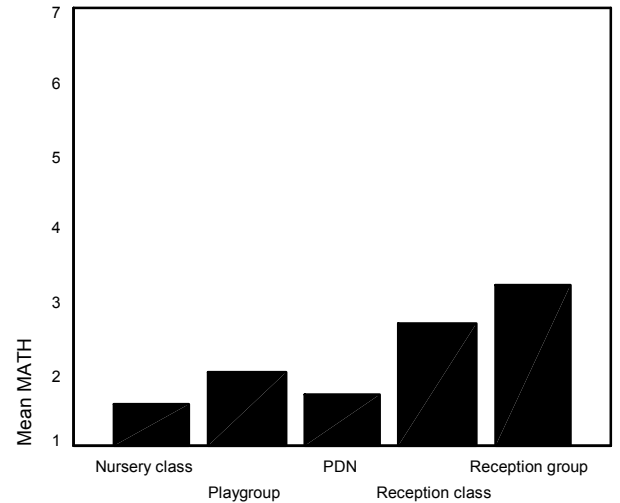


Figure 18:
Science/Environment by pre-school type

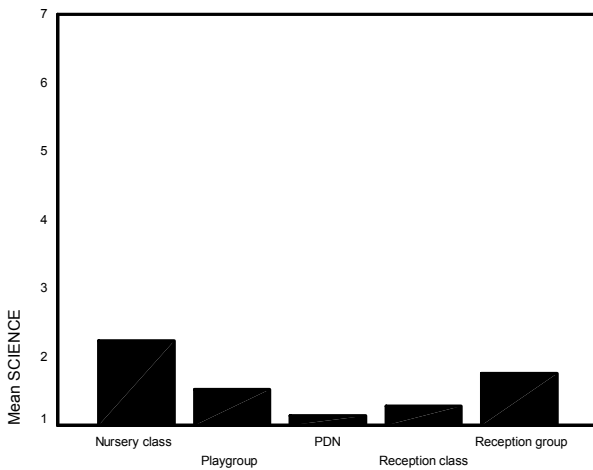
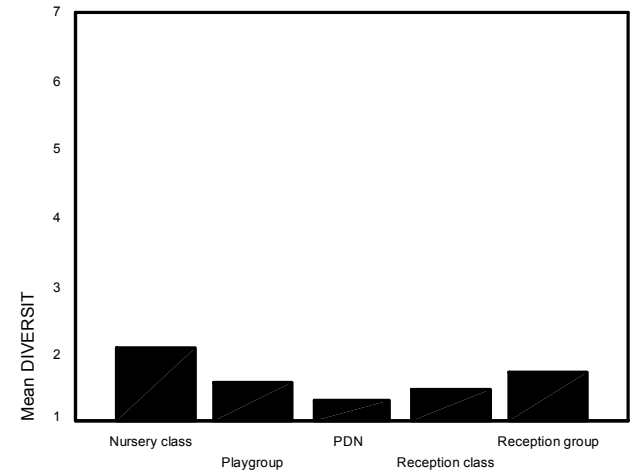


Figure 19:
Diversity by pre-school type



For ECERS-E total scores the only statistically significant differences between pre-school groups were that reception groups and reception classes were both higher than private day nurseries. In considering the ECERS-E subscales, for literacy the reception groups scored significantly higher than private day nurseries, but all other comparisons were non-significant. For mathematics, reception classes and groups scored higher than all other pre-school types, but this was statistically significant only for the comparisons between nursery classes/schools and private day nurseries. For science and the environment nursery classes/schools scored higher than all other pre-school types.