TERRITORIAL JUSTICE AND THE PROVISION OF NURSERY EDUCATION IN ENGLAND AND WALES 1981-1994

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Abstract

This study is concerned with the geographical distribution of the provision of nursery education in England and Wales from 1981 to 1994. It examines the extent to which the provision of nursery education is related to the need for the service. Davies's (1968) concept of territorial justice implies a positive correlation between need and provision. This interpretation of territorial justice is well established in the academic literature on the distribution of public services. Boyne and Powell (1991) have questioned whether a positive correlation between need and provision is always required for territorial justice. The key issue, it has been argued, is the requirement to consider the dimensions of need and service provision. This study assesses the validity of Boyne and Powell's (1991) analysis and builds substantially on its foundation. A new set of criteria for the assessment of territorial justice is developed. These are presented as the alternative to the Davies (1968) criterion of territorial justice. Territorial justice is more appropriately concerned with 'equal provision for relevant dimensions of need'. The criteria for the evaluation of territorial justice developed in this study are applied to nursery education. The correlations provide a mixture of evidence of territorial justice and injustice in the quantity of service provision, together with territorial injustice in the quality of service. The Davies (1968) criterion of territorial justice would have indicated greater territorial justice in the provision of nursery education than that found using the new criteria. This study contributes at two levels to previous literature on territorial justice: a new method is used to assess territorial justice and new evidence on territorial justice within nursery

education provision in England and Wales is presented. Further studies using the criteria developed in this study are required in other areas of public policy.

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I dedicate this research to my mother. I regret that she is not here for its completion.

Chapter 1: Introduction

The educational needs of children under five years old are at the top of the political agenda in England and Wales. The benefit which children under five can gain from nursery education has attracted interest from politicians, educationalists and the media (Moss and Penn 1996, Ball 1994, O'Leary 1994). Nursery education still remains a discretionary local authority service in England and Wales, despite a recognition that it is an important preliminary stage in the educational development of a child (Education, Science and Arts Committee 1988). The demand that "high quality publicly funded education provision should be available for all 3 and 4 year olds" (National Commission on Education 1993:130) continues to feature in the policy documents of a number of organisations, including the Royal Society of Arts (Ball 1994) and political parties (Foster 1994, Blunkett 1995). In response to these demands, the Government has proposed to introduce a voucher system in nursery education. The initiative will apply to four year olds in the first instance. This system is significant because it is the first official policy commitment to provide access to nursery education for children below statutory school age throughout England and Wales.

Whilst the consequences of the voucher system are not yet clear, the voucher system does focus attention on the current distribution of nursery services. It has been asserted that access to nursery education is influenced by the geographical area in which a child resides (Audit Commission 1996 see also section V below). Pugh (1987:304), for example, argues that "pre-school provision is largely a lottery, in which decisions about a child's pre-school experience depend on where that child happens to live". Variations in the quantity of nursery education across geographical areas have been focused on in this debate about access to services. Many authors have highlighted differences in the number of places available between local

authorities and regions within Britain (eg. Blackstone 1971, Van Der Eyken *et al* 1983, Penn and Riley 1992, Ball 1994, Audit Commission 1996). For example, Van Der Eyken *et al*'s (1983) research on the geographical distribution of pre-school services indicates that 37% of children in the South East of England attend pre-school establishments compared to 3% in the South West. Similarly, the Audit Commission (1996) highlights that some local authorities in England and Wales provide for 25% of children, whilst in other authorities, 90% of children have a nursery place.

Recent attention has also focused on the quality of nursery education. The emergence of interest in this issue may be linked to the quest for quality which is evident in the public sector more generally (Walsh 1991). Current research in nursery education is concerned with the identification and meaning of quality in nursery settings (eg. Department of Education and Science 1990, Sylva and David 1990, OFSTED 1993a, Moss 1994). The specific emphasis of these studies is on the quality of the nursery curriculum rather than on geographical variations in quality. Thus, whilst there has been much research on geographical variations in the quantity of nursery education, variations in the quality of service have not yet been measured or evaluated.

The much reported finding that there are geographical variations in the distribution of nursery education provided the catalyst for this study. Do levels of service provision vary dramatically across local authority areas? What is the relationship between the need for nursery education and its provision? Do areas which have the greatest needs have the highest amounts of service provision? Similarly, in areas where there are low needs, is the provision of nursery services also low?

The aim of this study is to evaluate the extent of territorial justice in the provision of nursery education across local authority areas in England and Wales between 1981

and 1994. In other words, are geographical variations in the provision of nursery education related positively to the need for the service?

This introductory Chapter is divided into six parts. In part one, the theoretical foundation of the study is examined. This is the concept of territorial justice which is concerned with the geographical relationship between need and provision within public services. In part two, the historical development of nursery education in England and Wales is discussed. The influences which have encouraged or restricted the provision of nursery services are identified. Part three reviews existing studies of territorial justice in local authority and health services within the UK. The range of services in which territorial justice has been assessed are identified and the findings of these studies discussed. The limitations of previous evidence of territorial justice in public services are highlighted. The methods of this study are outlined in part four. Part five assesses the extent to which territorial justice is likely to exist in local authority nursery education services. Finally part six outlines the contents of Chapters two to six.

I. Theoretical Foundation of this Research

The theoretical foundation of this research is the concept of territorial justice which is concerned with the geographical distribution of public services. According to Davies (1968), territorial justice is achieved where the provision of a service is positively related to the need for the service. Territorial injustice exists when service provision is negatively associated with service needs. Davies (1968) argues that:

> "in services for which the most apparent appropriate distribution between individuals is 'to each according to his need', the most appropriate distribution between areas must be 'to each area according to the needs of the population of that area'. Since the former criterion is synonymous with social justice we can call the latter 'territorial justice' (Davies 1968:16).

Territorial justice is based on the assumption that the criterion of need is appropriate in the distribution of public services. Davies (1968:39) argues that territorial justice is "an area distribution of provision of services such that each area's standard is proportional to the total needs for services of its population". Territorial justice demands that individuals who are in equal need, but living in different administrative areas, should have access to the same level of service. Allocating resources or services on the basis of justice does not mean that equal shares of public goods should be provided to all individuals, but rather that the supply of goods should vary in proportion to the needs of different groups. Territorial justice relates to the "equal treatment of like people, wherever they are located" (Bennett 1980:405). Territorial justice therefore implies equal provision for equal need. The concept of territorial justice not only provides a criterion for allocating resources between areas, but is also a means by which the justice of existing and previous resource allocations can be assessed.

Le Grand *et al* (1992) argue that the allocation of public services on the basis of need is required so that the objective of equity is upheld. A desire for equity represents one of the central justifications of the welfare state in Britain. As argued by Bartlett and Le Grand (1993:18) "the motivation that underlay the creation of the welfare state in the first place was in large part the promotion of greater social justice or equity" [1]. Powell (1995a) argues that that the desire for minimum standards and universality are the objectives of the welfare state. Minimum standards imply the allocation of welfare state resources to those who fall below the identified minimum. Thus, equity is the criterion upon which resources are allocated in attaining the

[1] Social Justice and equity are used interchangeably in this quotation. The relationship between these concepts is considered below.

objective of minimum standards. Universality relates to the provision of equal access to services to individuals on the basis of their common citizenship. Universality is therefore concerned with the extent to which there is equal access to services and not equality in relation to the distribution and allocation of these services. On the basis that welfare services are intended to be distributed on the criterion of equity, the evaluation of service provision should assess the extent to which equity has been achieved.

Equity is not easily defined since it is "a concept subject to many interpretations in policy contexts" (Bartlett and Le Grand 1993:18). Truelove (1993:20) also argues that "it is difficult, if not impossible, to provide one definition of equity that is applicable in all situations". Le Grand (1991) suggests that equity is synonymous with both fairness and justice; Glennerster (1992) argues that the obligation which equity places on public organisations is one in which all individuals should be dealt with fairly - individuals in the same circumstances should receive the same service. An equitable service may be one in which the distribution of resources is based on the circumstances of individuals. The concept of equity is concerned with fairness in the allocation of resources. Relevant criteria such as need, rights and effort are central in meeting the equity objective (Boyne and Powell 1995). It is the criterion of need, however, which has received the greatest recognition within the literature (Forder 1974, Plant *et al* 1980 and Bartlett and Le Grand 1993). For example, Bartlett and Le Grand (1993:19) argue that "we shall consider an equitable service to be one where use is determined primarily by need".

Whilst the concept of equity is distinguished from that of equality within the academic literature, the terminology of 'equality' is frequently adopted to describe equity. For example, Le Grand (1982:12) argues that "...equality in one sense or another has

been achieved [by the welfare state]. In particular, it is widely believed that public expenditure on the social services has been directed at the less well off, that such expenditures benefit the poor more than the rich". In this extract, Le Grand uses "equality" to describe the allocation of more resources to some and less to others. The concept of equity rather than equality would be more appropriate in this context. Another author, Smith (1994a) does not use the term 'equity' at all. Smith (1994a), uses the terms 'arithmetic' and 'proportional' equality. Arithmetic equality, it is argued, is concerned with the allocation of an equal share of resources or service provision to all individuals. In contrast, the allocation of resources on the basis of proportional equality implies the distribution of unequal shares to individuals on the basis of relevant criteria such as needs, merit and effort. This is the concept of equity. In an earlier discussion, Smith (1977) uses both 'proportional equality' and 'equity' to describe fairness and justice.

As equity is concerned with fairness and justice in the allocation of resources, the term 'social justice' implies equity among individuals in society (Smith 1994a). Traditionally, academics have concerned themselves with the issue of social justice and the distribution of welfare services between individuals within society on the basis of social class, for example. (Floud *et al* 1956, Le Grand 1982). Social justice concerns a "just distribution (of resources) justly arrived at" (Harvey 1973:98). This implies that social justice can be achieved when resources are distributed on the basis of known and accepted rules, and that these are applied in the resolution of conflicting claims for service provision. Social justice concerns the distribution of resources between different groups within society, for example, social classes, religious denominations and ethnic groups. Harvey argues that embodied within the concept of social justice are the three concepts of need, merit and contribution to the common good (Harvey 1973:101). As territorial justice is concerned with the need

for and the provision of public services, it is only this aspect of social justice which is relevant here. Contribution to the common good relates to an individual's contribution to society. In social justice terms, those individuals who contribute at a high level to the success of a society have a greater claim on its benefits. An allocation of resources would meet the objective of merit if individuals were allocated the products of society on the basis of their effort and achievement. One factor which may impede the achievement of social justice is the extent to which the three elements within the concept are compatible with each other. Neither contribution to the common good nor merit are relevant to the concept of territorial justice. The existence of territorial justice therefore does not imply that social justice has also been achieved, since merit and contribution to the common good also have to be taken into account. In addition, territorial justice does not necessarily imply that services have been allocated in proportion to the needs of individuals within each area. As Kirby and Pinch (1983:231) argue, "patterns of allocation between areas do not necessarily imply similar patterns amongst individuals within the areas as one cannot be certain that those in most need actually receive the service". Territorial justice is therefore concerned with 'block equity', rather than 'individual equity', that is, the level of fairness which exists at the area level is focused on, rather than fairness attached to individuals within an area (Rae 1981). Davies (1968) does not make reference to the relationship between social and territorial justice, but does link the two concepts in a later discussion: "if perfect social justice prevailed, there would, by definition, be territorial justice" Davies (1978:219). Underlying this view is the assumption that need is the only criterion of social justice. Thus Davies ignores the criteria of merit and contribution to the common good within social justice which Harvey (1973) put forward. Whilst this is an interesting issue in itself, this study is solely concerned with territorial justice between areas and not social justice either between or within areas.

The distribution of services between geographical areas has generated interest following the work of Davies (1968). Smith (1977:94) argues that "the normal context for the discussion of distribution is population groups such as races or social classes. In geography, the primary focus is on distribution in space or among territories - who gets what where". There are two categories of study in this area. In the first, geographical variations in public services are reported and highlighted (eg. Pinch 1987, Curtis 1989). In Pinch (1987), for example, the amount of day care provision for children of pre-school age in England in 1977 and 1983 is examined. The study reports that the provision of playgroup places, for example, in 1983 is highest in the shire counties which had the largest number of places in 1977. Research such as this is concerned with inequality in the geographical distribution of public services. These studies do not, however, provide evidence of territorial justice. In the second set of studies, an attempt is made to explain variations in service provision across geographical areas. These studies have been termed output studies and "address the central question of political science: why do different governments adopt different policies?" (Boyne 1985:473). The influence of factors such as need and the political and resource environment on service provision are assessed in output studies. For example, do the areas with most provision have the most need? do these areas have the highest resources? is there a relationship between political control of local authorities and levels of service provision? Output studies therefore assess the relationship between a number of influences on service provision. Some output studies, whilst concerned with the relationship between a range of variables together and service provision, also focus on the relationship between need and provision. These output studies contain evidence on territorial justice. Examples include Boaden (1971), Danziger (1978) and Sharpe and Newton (1984). Research which focuses on the relationship between need and provision alone also represent studies of

territorial justice (eg. Howick and Hassani 1979 and 1980, Powell 1987, Powell 1992). All studies of territorial justice evaluate the relationship between need and provision.

As defined by Davies (1968), territorial justice is concerned with the relationship between need and service provision. Territorial justice therefore excludes other criteria of equity such as merit and effort identified by Boyne and Powell (1995). It also excludes two of the criteria within social justice. These are merit and contribution to the common good (Harvey 1973). Territorial justice requires that geographical areas should receive the quantity and quality of services in proportion to the level of need within each area. Territorial justice is not only a means of allocating welfare resources between areas, but is also a criterion by which the equity of the existing distribution of public services can be assessed.

This section has introduced the concept of territorial justice which is firmly rooted in the assumption that the criterion of need is appropriate in the distribution of public services. Territorial justice is narrower than the concept of equity because it is only concerned with the relationship between need and service provision, and not also the criteria of merit and effort. Territorial justice may also be distinguished from social justice on the basis that the concept focuses on the distribution of services between geographical areas rather than individuals and is solely concerned with the criterion of need. This section of the study now moves on to outline the development of nursery education in England and Wales.

II. Historical Development of Nursery Education in England and Wales

This study of territorial justice in nursery education must be set within the context of the development of the service in England and Wales and the different interpretations

of need which have influenced service provision. Nursery education evolved over a long period prior to a recognition of the service within the legislative framework. The first infant schools were established in the 1820s in several industrial towns in England. Whitbread (1972:8) argues that the rationale supporting the development of these schools in England was based on "moral and social rescue, reduction of petty crime against property, and early training and discipline". The Factory Act of 1833 was also influential in the growth of education for young children since the Act debarred the employment of children under nine and ten years in a number of industries. The entry of children up to the age of ten in elementary schools had an effect on the entry of the youngest children into infant and elementary schools. With the majority of parents in employment, and older children either working or in school, there was a need for a service for young children. In 1861, it was reported that 19.6% of children aged between three and six attended elementary schools (Whitbread 1972:24).

The foundations which led to the development of publicly provided nursery education were established by the Education Acts of 1870 and 1880. School Boards were authorised, but not required under the 1870 Education Act, to pass bye-laws for the enforcement of school attendance between five and thirteen years. The Education Act of 1880 forced School Boards to admit children to elementary schools at the age of five [2] (Evans 1985:44), but many children started school prior to this age. As argued by Whitbread (1972:44) "as school boards were established, attendance over five made compulsory and fees abolished, so infants of the manual working classes went to school in increasing numbers below the statutory age, just as those of the more

[2] the manner in which Parliament accepted five years has been described by Stretzer (1964:20) as fortuitous. Parliament was divided on whether children should begin school at five or six. Whilst only a short time was spent debating this issue, one Member proposed five years and this was accepted.

prosperous, skilled workers had even before 1870". Woodhead (1989) argues that entry to school before the legal requirement was a result of a concern with the health and welfare of children, especially those who lived in unhealthy and cramped slum accommodation. A second reason was the "pressure from working parents for schools to accept the younger brothers and sisters of older pupils who, prior to compulsion, would have played a major part in their daily care" (Woodhead 1989:9). Stretzer (1964:22) also suggests that "since the school deprived some parents of the earnings or services of their older children, it seemed fair to compensate them by looking after the younger ones as much as possible". The Education Acts therefore prevented older children from caring for younger members of their family. It is somewhat ironic that the attendance of three and four year olds in schools reached a peak in 1899-1900, when 622,498 (or 44% of children) attended elementary schools, since no consideration was given to the distinctive educational needs, if any, of this client group. It is only in recent years that children attended pre-school in numbers which can be compared with the 1899 period, for example, in 1986 508,683 children under five (43%) were enrolled in pre-school education (Woodhead 1989:8). A further pressure on the early admission of children to elementary schools was the 'payment by results' system introduced in 1862. Under this system, schools received grants on the basis of the results of the examinations taken by children at the age of six and upwards. Although children under six were not involved in the examinations, schools took the view that in order to achieve identifiable targets in educational terms, the formal system of education should begin as early as possible (Whitbread 1972:27). Thus children under five obtained the same kind of instruction as older children and "sat in galleries and were drilled in numbers and letters" (Blackstone 1971:23).

A dissatisfaction with the educational experience offered to the under fives in elementary schools served, in part, to change the pattern of pre-compulsory education in England and Wales. During the later part of the nineteenth century, the increasing influence of those encouraging the development of the kindergarden movement in Britain led to a re-examination of the education offered to the under fives (Woodhead 1989:9). Embodied within the kindergarden movement were the philosophies of the educational theorists Froebel and Montessori which centred on the value and significance of young children as individuals. The influence of these and other British educationalists including McMillan and Isaacs was fundamental in the development of a separate pre-compulsory education service. The approach promoted by these educationalists was a child-centred one in which the education of children through play was considered essential for the development of the individual child. Curtis (1986:5) argues that these educationalists "held the view that the young child is first and foremost a whole person, with thoughts, feelings and imagination that need to be cared for and cherished". These needs were not being fulfilled within elementary education.

The absence of a child-centred early years curriculum encouraged the view that elementary schools may not be the most appropriate schooling for the education of the under five population. The first nursery school was established in Deptford by McMillan, an educationalist, in 1911 in order to alleviate the suffering, hardship and lack of medical care experienced by young children. McMillan's drive to create a separate nursery school facility was partly a response to the inadequacy of the medical inspection arrangements introduced under the 1906 Liberal government reforms. These regulations only protected children over the age of five in elementary schools. In addition, McMillan believed that "young children need nurture, that schools should

develop close home and neighbourhood links, and that pre-school children should have appropriately-trained, well-qualified teachers" (Bradburn 1976:162).

The publication of two official reports further strengthened the case for an alternative to elementary schooling for the under fives. The first of these was a report by the Women Inspectors of the Board of Education published in 1905 which highlighted the view that elementary schooling was unsatisfactory for children under five years:

"the mechanical teaching in many infant schools seems to dull rather than awaken the little power of imagination and independent observations which these children possess"(pi).

The report argued that "where the Local Education Authority have so determined in the case of any school maintained by them, children who are under five years of age may be refused admission to that school" (Board of Education 1905 cited in Board of Education 1908:12). Quite apart from the possible exclusion of the under fives, the Inspector's report also considered the establishment of an alternative to the elementary school necessary for 'poor' children whilst children from the "better" homes should remain within the family environment. The report argued that:

"It would seem that a new form of school is necessary for poor children. The better parents should be discouraged from sending children before five, while the poorer who must do so, should send them to nursery schools rather than schools of instruction" (pii)

The second report on elementary school attendance prior to compulsory education was published by the Board of Education in 1908. Endorsing the Inspectorate report of 1905, the 1908 Consultative Committee report argued against the continued attendance of children under five in elementary schools. The Committee favoured the home as the best environment for children between three and five, and for those

children whose home situation warranted it, they "advocated the public provision of early education and training for all children whose home conditions and parental care were inadequate" (Blackstone 1971:31). The recommendation made by the Committee was that provision would take the form of a nursery school separate from the elementary school. The provision of nursery schools in each area was to be based on "the industrial and social conditions of the area, and the proportion of children under five years the conditions of whose homes are unsatisfactory" (Board of Education 1908:48). The report recommended that in urban areas the majority of children aged 3 to 5 years should be regarded as eligible for nursery provision. Local authorities were therefore to be given responsibility for the provision of nursery schools based on the criterion of the level of need within the areas for which they were responsible. The Committee also made recommendations on, for example, the nature of the curriculum, and the requirement to have classes with thirty children (or less) to encourage intellectual development.

The 1908 report was officially responded to in the 1918 Education Act. This legislation gave local education authorities the power to establish nursery schools for children aged between two and five years. The provision of nursery schools was not mandatory "we do not desire to compel the provision of nursery schools, but we propose to enable such schools, attendance at which must be voluntary, to be aided from the rates..." (Fisher 1919, cited in Blackstone 1971:41). David (1993:135) argues that the decision to allow local authorities to decide whether to provide nursery schools represents the "beginnings of a policy that the provision of nursery education should be subject to local, rather than central, government decision making". Nursery schools and classes were to be provided for children where it was considered necessary for the healthy physical development of children. Local authorities, however, did not develop nursery provision for children and, as

highlighted by Woodhead (1989:10), in 1929 there were only 29 state nursery schools in England and Wales. Blackstone (1971) argues that there were two reasons for the subsequent slow development of nursery school education. Firstly, the permissive nature of the legislation meant that local authorities were not under a duty to provide nursery schools. Secondly, since nursery schools were to be funded out of locally raised revenue, local authorities were reluctant to raise additional revenue.

Section 12 of the Education Act 1921 consolidated the existing legislation on nursery education. The Act gave local authorities the power to provide nursery schools and classes for children aged between two and five years. The service was recommended for those children "whose attendance at such a school is necessary or desirable for their healthy physical and mental development" (cited in Kent and Kent 1970:32). The decision by the Board of Education to issue a Circular later in the same year advising local authorities against the establishment of nursery schools is likely to have caused some confusion among authorities. This change of policy, caused by a shortage of funds after the war, continued until 1925 when new guidelines on nursery schools were issued. Whilst the continued provision of nursery schools was supported, schools were advised to restrict the number of places so that any risks associated with the spread of infection were minimised.

That the home was considered to be the ideal environment for children was again endorsed in the Hadow Report (Board of Education 1933:182) which argued that "the fundamental purpose of the nursery school or class is to reproduce the healthy conditions of a well-managed home". The Committee report did not accept that nursery schooling was necessary, or desirable, for all children under five, only those "who by reason of unsuitable environment require careful attention to their physical welfare and need to spend longer hours at school and to be provided with meals"

(Board of Education 1933:188). The impact of the Hadow Report and the other reports above had the overall effect of restricting the availability of nursery school education. A decline in the child population in the mid 1930s, however, facilitated the education of children under five. Local education authorities used the empty places within schools to provide nursery classes for the under fives, rather than nursery schools. Blackstone (1971:56) cites the examples of Manchester and Leicester which, during the 1930's, had adopted policies of providing nursery class facilities for the under five population within their areas. The provision of nursery facilities rapidly expanded with the second world war. Dent (1944:86) argues that "these good war-time nurseries are doing much to popularise the idea of a nursery stage in education and are opening the eyes of numerous parents to the high quality of the nursery school".

The White Paper which led to the Education Act 1944 represents the first official recognition of the value of nursery education for all children "...even when children come from good homes they can derive much benefit, both educational and physical, from attendance at nursery school" (Board of Education 1943, cited in Blackstone 1971:64). Under the 1944 Education Act, local authorities were given responsibility for securing the provision of primary and secondary schools and in the fulfillment of this were to "have regard to the need for securing" the provision of nursery schools (Education Act 1944). However, an expansion of nursery places did not occur following this legislation. Blackstone (1971:65) argues that there were three reasons for this: a shortage of teachers in infant and primary schools, the rise in the birth-rate in 1946 and the need for cuts in education expenditure requested by the government in 1949. Whilst places were available in primary schools once the post-war 'bulge' of children had passed through, children under five were not admitted to primary schools. This was because a reduction in class sizes in primary schools was deemed

appropriate. In addition, it was argued that teachers should be available to cover additional demands in the secondary education sector which would soon be required to provide an expanded service. Timmins (1996:149) argues that the "victims of this demographic shift in the school population proved to be the plans for nursery education". A government Circular in 1958 forbade education authorities, on economic grounds, from increasing overall levels of nursery school or class provision (Ministry of Education, Circular 334 1958). Local authorities were advised to maintain their current levels of nursery places, and by making provision part-time instead of full-time, they could offer twice the number of children a place. A further Circular in 1960 (Ministry of Education, Circular 8/60) endorsed this advice.

With the publication of the Plowden Report in 1967, the educational needs of young children, once again, attracted attention largely as a result of the compensatory value deemed to result from nursery education. The report argued that "attendance at a nursery school is desirable for most children. It is even more so for children in socially deprived neighbourhoods. They need verbal stimulus, the opportunities for constructive play, a more richly differentiated environment and the access to medical care that good nursery schools can provide" (Central Advisory Council for Education 1967:61). Nursery education could 'compensate' for adverse home circumstances. Similarly, Hechinger (1966:6) argued that "if deprivation starts to build up at an early age and progressively limits and eventually blocks entry into the mainstream of society, then an early start must be made to offset the lack of parental teaching, care and mind-molding". The 1972 White Paper, 'Education: A Framework for Expansion' (DES 1972) recommended the expansion of nursery education provision within a ten year period. The proposed places would be offered on a full time basis for 15% of three and four year olds, and on a part-time basis for 35% of three year olds and 75% of four year olds. The White Paper argued that "it would be right for most of the

extra nursery provision to take the form of classes for the under fives forming part of primary schools" (DES 1972:6). A high proportion of the increased places which resulted were created by the early admission of under fives into reception classes within primary schools and through the conversion of full-time nursery education places to part-time provision. Areas with "substantial social deprivation" were to be given priority in the allocation of funding during the years 1974-76 (DES 1972:7). Between 1966-1987, the number of children under five receiving some form of local authority nursery education increased from 15% to 48% (Family Policy Studies Centre 1989).

The legislative duty accorded to local authorities to have regard for the needs of all children was amended in the 1981 Education Act. Under this Act, local education authorities were only required to consider those children between the ages of two and five with statements of special educational need and not all children under five. That local authorities were given the power, but not the duty, to provide nursery education facilities meant that places were not universally provided for all children in the same way as compulsory education.

Legislative change in two areas is likely to have an impact on nursery education. Firstly, the passing of the Education Reform Act 1988 marked the introduction of formula funding which may encourage schools to be more receptive to the early admission of four year olds to infant classes within primary schools (Pugh 1992). Schools which recruit the highest numbers of pupils attract the greatest proportion of resources. Against a background of falling rolls, Daniels *et al* (1995), find evidence to suggest that schools are admitting increasing numbers of children under five. The introduction of the national curriculum with associated staged tests at 7, 11, 14 and 16 may also enhance the provision of educational facilities for children under five.

Like the 'payment by results' system introduced in 1862, the assessment of children in primary schools is likely to increase the demand from parents for early education. Blenkin and Kelly (1994:196) also argue that the national curriculum will promote a more structured curriculum in under-fives education - one which may not necessarily be appropriate to the needs of these children. Research conducted by Sylva *et al* (1992) highlights that a large proportion of those involved in early years education have changed their practices as a result of the national curriculum. Evidence presented by the authors shows a greater emphasis within the curriculum on targets and achievement. OFSTED's (1993a) research into standards within reception classes supports this finding. The Children Act 1989 represents the second legislative reform which may promote the development of additional services for the under fives. The Act places an obligation on local authorities to review the range of under five services.

The most recent policy development is the proposal to introduce an education voucher in nursery education. A voucher, planned for distribution to all parents of four year olds, was announced by the Prime Minister in October 1994. It is expected that the voucher can be exchanged by parents for a pre-school place in the public, private or voluntary sectors. The government, currently in the consultation phase of this initiative, began a pilot study of vouchers in April 1996.

In England and Wales, the public provision of nursery education continues to be discretionary. There is no requirement for local authorities to provide the service, nor for three and four year olds to attend any form of nursery service. The supply of nursery places has been affected by two conflicting influences at the same time - those which served to increase provision and those which reduced the availability of places. In relation to the factors which led to the development of nursery education,

Blackstone (1971) argues that there are two different, yet complementary, strands. These are the demands which originated from the middle class and those which came from the working class. The middle class demand for nursery education was driven by a desire to encourage the progress and development of children. The working class demand was more closely associated with the provision of an environment which was more adequate than the slum conditions in which some children lived. Both of these strands had one factor in common - a belief that the home was inadequate in meeting a child's needs. The influence of both the middle class and working class demands were important in the promotion of nursery education.

Kent and Kent (1970:20) argue that the factors which restricted expansion were the "belief that the place of pre-school children is in the home" and "the great pressure on available resources to meet the requirements of compulsory education". Randall (1995:347) also argues that the lack of progress in the development of child care policies, including nursery education, is associated with "an exaggerated respect for the autonomy of the family, which at the least has been available as a useful rationalization of non-intervention" and "perceptions of the family (which) have been permeated by an ideology of motherhood". Similarly, Jackson (1993) argues that the provision of nursery education has been affected by the belief that children are the responsibility of parents, and not of society as a whole. The cost of providing nursery education for all children is also viewed by Bilton (1993) and Randall (1995) as a factor which has restricted its expansion.

As highlighted in this examination of the development of nursery education, the issue of whether the home or nursery education outside the home is the most appropriate environment for children under five has not yet been resolved. Where there does appear to be a consensus is in relation to children who live in 'inadequate' home

circumstances - official reports have historically emphasised the value of nursery education for these children. In relation to other children, whilst the benefit of nursery education in the development of the whole child is recognised, the value of the home and the family in the enhancement of a child's progress are also important. The absence of agreement on the most appropriate environment for these children has served to restrict the supply of nursery education.

This examination of the development of pre-compulsory education provision has focused on the influences which have encouraged or restricted the supply of places for the education of children under five. The provision of a separate nursery education sector was influenced by a dissatisfaction with the formal education offered within elementary education. The benefit of pre-school education for children whose home environment is unsatisfactory has historically been the key factor which has enhanced the provision of nursery education. The other influence has been a belief that all children can benefit from nursery education. In contrast, nursery education has been restricted by the view that the home environment can offer an appropriate setting for children under five. The financial cost of nursery education has also restricted its supply. This examination of the historical development of nursery education has revealed the absence of agreement on whether nursery education should be provided for children or not. This may have served to restrict the supply of nursery education in some areas in comparison to others.

III. Studies of Territorial Justice

This section of the Chapter reviews the previous evidence on territorial justice and highlights the limitations of the research. Studies of territorial justice began following the work of Davies (1968) who specified the meaning of the concept and the statistical criterion for territorial justice. Davies's (1968) definition and statistical

criterion have been applied in subsequent analyses of territorial justice. Empirical studies have been undertaken for a number of local authority and health services within the UK (see Boyne and Powell 1991 for a comprehensive survey). Of the services delivered by local authorities, there are studies of territorial justice in education, housing and personal social services. The majority of studies focus on one service area. Blackstone (1971) and Pinch (1984), for example, are solely concerned with nursery education and pre-school services more generally. Howick and Hassani (1979, 1980) examine territorial justice in primary and secondary education. In the personal social services, Bebbington and Davies (1982) focus on territorial justice in services for the elderly. Pinch (1978) and Boyne and Powell (1993), for example, assess territorial justice in housing services. In the health sector, studies include Forster (1979) and Powell (1987, 1990a, 1991, 1992, 1995). In addition to these service specific studies, others examine territorial justice across a number of services (Davies 1968, Alt 1971, Boaden 1971 and Danziger 1978). The most recent studies of territorial justice have been undertaken by Powell (1987, 1991, 1992, 1995b) in health services and by Boyne and Powell (1993) in housing. A number of Powell's studies (1992, 1995) assess the extent of territorial justice before the establishment of the National Health Service in England and Wales. Excluding Boyne and Powell (1993) and Powell (1987, 1991), there have been no other published studies of territorial justice in any service since Jesson *et al*'s (1985) examination of territorial justice in education, which was concerned with the relationship between need and provision in education services in 1981. There are therefore few analyses of territorial justice during the 1980s and 1990s.

Studies of territorial justice are mainly British in character. Pinch (1985) argues that this may be because of the wide scope of welfare services in Britain compared to the United States, for example. In relation to the geographical coverage, few of the

studies of territorial justice examine service provision across England and Wales as a whole. The majority of studies focus on urban areas and the London boroughs. There are no studies of territorial justice in health care or personal social services for all authorities in England and Wales. Powell's (1992) study of territorial justice in health care comes closest to covering the whole of England and Wales (only South Wales is excluded). In housing, Boyne and Powell (1993) is the only study of territorial justice which covers all local authorities. In education, Howick and Hassani (1979, 1980) and Jesson *et al* (1985) are the only studies which cover the whole of England and Wales. The failure in the majority of studies to include all geographical areas means that whilst there may be territorial justice or injustice within different groups of authorities, the level of territorial justice across England and Wales as a whole in most services is not known (Boyne and Powell 1993).

The extent of territorial justice found within these studies may be assessed on the basis of the classifications presented in Boyne and Powell (1991). These classifications are weak, moderate and strong territorial justice. For example, where the correlation between need and provision is low, for example, this represents weak territorial justice. Injustice is present if the statistical relationship between need and provision is significantly negative. The category 'unpatterned' may be used to describe evidence which indicates neither justice or injustice. Across all of the empirical studies, there is a mixed pattern of evidence on the existence of territorial justice. In education, the correlation between need and provision can be described as moderate overall, with some evidence of territorial injustice. Moderate territorial justice is found in Boaden (1971) and Pinch (1984), for example. Davies (1968) finds evidence of territorial injustice between need and expenditure per primary school pupil. In housing, most studies find evidence of moderate territorial justice (eg. Alt 1971, Danziger 1978). In contrast, Boaden (1971) finds strong territorial justice

between the absence of amenities and local authority construction of housing. In the personal social services, the pattern of evidence provided by the studies is more mixed. In children's services, Boaden (1971) and Danziger (1978) find weak territorial justice. In services for the elderly, Bebbington and Davies's (1982) study indicates moderate territorial justice overall, with some evidence of strong territorial justice. The relationship between need and both residential accommodation and total services for the elderly indicates strong territorial justice. In health services, the evidence is also mixed. Whilst Powell (1987) finds moderate territorial justice, Jones and Bourne (1976) find weak justice. Forster (1979) finds an unpatterned relationship between need and the provision of General Practitioner services. Powell (1995b) finds a mixed relationship between need and provision. In this study, half of the correlations examined indicate territorial justice and the other half are unpatterned. In general, the relationship between need and provision across a range of public services may be described as indicative of weak-moderate territorial justice.

The majority of these studies measure service provision on the basis of inputs rather than outputs. Service inputs include the level of resources committed by public organisations to a particular service eg. expenditure or staffing. Service outputs involve the actual service provided by organisations such as the number school places. In education, expenditure per pupil and per capita are frequently used to measure service provision (Davies 1968, Alt 1971, Sharpe and Newton 1984). Only Blackstone (1971) and Pinch (1984) measure education on the basis of output indicators of provision (nursery places). In housing services, output indicators are more dominant than in education. For example, many studies use indicators of house construction rates (Boaden 1971, Danziger 1978, Kirby 1981). Indicators of inputs are also used in some housing studies (Alt 1971, Nicholson and Topham 1971). Within personal social services, indicators of inputs and outputs are used in the

measurement of service provision. Bebbington and Davies (1982), for example, use output measures, such as residential care places per 10,000 population, in addition to indicators of inputs (expenditure per person). Boaden (1971) and Danziger (1978) adopt only input measures of health and welfare services. In the health sector, input indicators of service provision are dominant. For example, Forster (1979) uses the indicator 'GPs per million population' to measure provision. Similarly, West and Lowe (1976) use 'staff per 1,000 population'. The widespread reliance on input measures may not be appropriate in the assessment of territorial justice. Input measures may not provide an accurate indication of the amount of service provision which is delivered because production costs and efficiency levels vary across areas (Boyne and Powell 1991). Thus one area may be able to produce higher service levels than another with the same resources. Indicators of service outputs represent a more appropriate measure of service provision than inputs.

With the exception of Powell (1987, 1990b), all of the existing studies of territorial justice focus on the relationship between the need for services and the quantity rather than the quality of service provision. Powell (1987) finds evidence which indicates that quality of service is negatively related to need. Powell (1990b) finds that the relationship between need and quality is varied with some negative and some positive correlations. Both of these studies also find some evidence of territorial justice in the quality of service provision. The absence of other evidence precludes the development of firm conclusions on the relationship between need and quality of service.

In summary, four broad conclusions may be drawn about the existing evidence on territorial justice. First, the majority of studies are focused on specific geographical areas instead of all authorities across England and Wales. Second, many of the

studies are quite dated with few evaluations of territorial justice during the 1980s and 1990s. Third, the quantity of service is assessed on the basis of input indicators of provision. As indicated above, inputs may not be relevant to territorial justice. Fourth, quality of service is excluded in almost all of the studies. This study addresses each of these issues in the assessment of territorial justice in nursery education. Firstly, this study assesses territorial justice across all Local Education Authority areas in England and Wales. Secondly, this study is concerned with territorial justice between 1981 and 1994 and therefore represents a contemporary evaluation of territorial justice. Thirdly, indicators of outputs are incorporated into the assessment of territorial justice.. Finally, quality of service is included in the assessment of nursery education provision.

IV. Method of this Study

A. Reconceptualising Territorial Justice

According to Davies (1968), the concept of territorial justice is concerned with a close relationship between the level of need for a service and the amount of service provision. The statistical criterion required for territorial justice is a perfect positive correlation between need and provision. Davies's (1968) concept of territorial justice and its statistical requirements have been used in all of the studies of territorial justice discussed above, with the exception of Boyne and Powell (1993). The concept of territorial justice has also gained wider currency in academic literature on the distribution of public services (eg. Smith 1977, Pinch, 1985 and Curtis 1989). The evidence found in studies of territorial justice has also been referred to in other research. For example, Glennerster and Low (1990:68) in their examination of education policies in Britain since 1974 argue that "over time, education has became the most equally distributed of all services". In support of this statement, the authors cite Davies's (1968) study of territorial justice.

It was not until the work of Boyne and Powell (1991) that the theory of territorial justice received its first effective re-assessment. Boyne and Powell (1991) questioned whether a positive relationship between need and provision is always required for territorial justice. The central issue is the identification of the dimensions of service need and provision. Boyne and Powell (1991) argue that in assessing territorial justice, the dimensions of need (breadth, depth and total) and the dimensions of provision (breadth, depth and total) should be considered. The authors suggest that territorial justice requires a positive correlation between need and provision only in particular circumstances. These are when corresponding dimensions of need and provision are compared, (where the breadth of need is compared with the breadth of provision, for example), or in situations where the relationship between the breadth and depth dimensions of need is positive. In other situations, insignificant and negative correlations can be indicative of territorial justice. Thus Davies's (1968) interpretation of territorial justice as 'equal provision for equal need' does not translate into a positive relationship between all indicators of need and provision.

This study assesses the validity of the analysis by Boyne and Powell (1991) and develops a framework of rules to assess territorial justice. These rules provide a more appropriate mechanism for the evaluation of territorial justice than that specified by Davies (1968). In addition, they substantially build on the arguments advanced by Boyne and Powell (1991) in two ways. Firstly, a detailed rationale supporting Boyne and Powell's (1991) interpretation of Davies's (1968) concept of territorial justice is presented in this study. Secondly, the rules specify the territorial justice requirements of all possible correlations between need and provision, including the quality of service provision. These rules are outlined and presented as the alternative to the Davies (1968) criterion of territorial justice.

This study takes the evaluation of the concept of territorial justice a stage further than that contained within Boyne and Powell (1991). Davies's (1968) concept of territorial justice implies 'equal provision for equal need'. The development of the rules in this study means that the statistical relationship between needs and provision established by Davies (1968) is no longer appropriate in all circumstances. Territorial justice does not always require a positive correlation between need and provision. The concept of territorial justice established by Davies (1968), a close correlation between need and provision, requires refinement. Conceptually, territorial justice is not concerned with a close correlation between need and provision. Rather, the concept of territorial justice demands the required correlation between need and provision on the basis of the rules presented in this study. Territorial justice is therefore more appropriately interpreted as 'equal provision for relevant dimensions of need'. Thus territorial justice requires that increases in the breadth of need should be matched by increases in the breadth of provision. Similarly, increases in both the depth and total dimensions of need should lead to proportionate increases in the depth and total dimensions of service provision respectively. Territorial justice does not require that increases in the breadth of need, for example, are matched by increases in the depth of service provision. This interpretation of Davies (1968) concept of territorial justice recognises the importance of the dimensions of need and provision in the assessment of justice.

B. Operationalising Territorial Justice

The assessment of territorial justice is based on a statistical analysis of the relationship between service need and service provision within nursery education. Following Davies (1968), correlation coefficients are used to determine the nature of this relationship. Correlation coefficients are appropriate since they allow the relationship

between the two variables, need and provision, to be identified (Bryman and Cramer 1990). Correlation coefficients do not imply causation (McMiller and Wilson 1983). Thus a strong correlation between need and provision does not mean that need has *caused* provision, or that provision has *caused* need. A strong correlation between need and provision implies a relationship between the incidence of need and the incidence of provision.

C. Data

This study uses data relating to the need for and the provision of nursery education in England and Wales between 1981 and 1994. All 115 local education authorities in England and Wales are included in the assessment of territorial justice. The data, derived from nationally published statistics, are used to identify the level of need and provision of nursery education. The use of statistical data is appropriate in this study due to the large number of authorities included and the analysis of need and provision over fourteen years. Alternative methods of data collection such as interviews with local education authorities or questionnaires sent to relevant individuals would have been inappropriate for two reasons. Firstly, the requirements of this study of territorial justice are comparable data relating to need and provision across all authorities. These data are already collected and published nationally by sources such as the Department for Education and Science (now the Department for Education and Employment) and CIPFA. Secondly, whilst interviews and questionnaries might have produced some additional data, the sheer size and scale of this study precluded the collection of this information on a comprehensive basis.

This section has presented the method adopted in this study. The existence of territorial justice in nursery education is evaluated on the basis of the new rules developed herein. This approach represents a significant departure from the statistical

requirement of territorial justice established by Davies (1968). Building on the work of Boyne and Powell (1991), the approach also advances the theory of territorial justice established by these authors. This study therefore develops and applies a new method in the assessment of territorial justice.

V. Territorial Justice and Nursery Education

This section examines the extent to which territorial justice is likely to exist in nursery education services. Firstly, as territorial justice is concerned with the relationship between need and provision, if central government allocates its resources to local authorities on the basis of need criteria, then it might be hypothesised that territorial justice is more likely to arise. The second issue relates to autonomy - territorial justice is more likely to exist in situations where local autonomy is weak and service provision is governed by central rules and regulations. The Layfield Committee (1976) drew attention to the effect of increasing local government discretion, highlighting that the standard of services, and the level of local taxation required to support services, would lead to substantial variation between authorities. Davies (1978:220) himself recognised the conflict between territorial justice and the autonomy of local authorities. He argues that in situations where local authorities have freedom from government intervention "the central government's ability to secure greater territorial justice would be greatly limited. O'Higgins (1987:11) also argues "territorial justice can only be ensured by continually intervening to restrict or direct the choices which local authorities make". Thus if central government has an objective of achieving territorial justice, central control of local authority decision making is more likely to lead to territorial justice than is local control. The acceptance of territorial justice as a policy objective of a local authority also reduces local control since "territorial justice requires local authorities to provide services at standards determined by the estimated needs of their population - a factor over

which they have no control - it must limit the autonomy of individual authorities to some extent" (Davies 1968:25). Walker and Lawton (1988:438) offer one of the few challenges to the view that territorial justice limits autonomy. The authors argue that "it is often assumed that centralist solutions guarantee, or at least enhance, territorial equity. For the most part, however, this is an untested assumption". The third issue relates to local democracy. Where local authorities have their own democratic legitimacy, the extent to which territorial justice can be achieved is weakened. Local democratic legitimacy means that local politicians have responsibility for decisions on local policies. The fourth issue concerns the level of professionalism operating within a service area. Professional power arises out of a shared professional ethos, common entry arrangements (usually restricted) and as a consequence of joint education and training programmes within a profession. Laffin (1986:109) argues that the level of professionalism "in a policy field has considerable impact on the content and form of policy in the field and also on policy implementation on the ground". Professionalism may serve to enhance uniformity in the provision of local services. Davies (1968:17) argues that "the more professionalised and better administered the services possibly the less important are individual value judgements, since more of the relevant aspects of the situation will be studied and controlled and subject to policy decision, either by the professional bodies or by the agency". Similarly Webster (1981:70) argues that "uniformity may...arise through the adoption of nationally or professionally defined standards of provision". Territorial justice is therefore more likely to achieved in services which are highly professionalised.

To summarise, territorial justice is more likely to exist where:

1. central government allocates its resources to local units on the basis of need;
2. central government controls local decision making;

3. local units do not have their own democratic legitimacy;

4. professional influence is strong.

The existence of territorial justice within a service is dependent on the relative strength of these four variables. In terms of nursery education the application of these factors in nursery education will now be considered. Firstly, central government resources are allocated to local authorities on the basis of their need for nursery education. One of the categories within the 'Education' Standard Spending Assessments in England [3] is 'Under Five Education'. Within this category there are two main criteria upon which resources are allocated: Additional Educational Needs (AEN) and the number of children under five. In the 1994/95 financial year, AEN was measured as children aged 0-4 years in lone parent families, those whose parents claimed state benefits and those children (or their parents) who were born outside the UK. The larger proportion of 'Under Five Education' resources (70%) is allocated on the basis of an authority's AEN (Department of the Environment 1990)[4]. Whilst local authorities are not required to allocate these funds to nursery education, it might be expected that in resourcing decisions, local authorities take account of the level of central government funding. Local authorities also have the capacity to enhance central funding by spending locally raised revenue, such as the Council Tax, on nursery education. Since central government allocates resources to local authorities on the basis of need criteria, local authorities are likely, in turn, to distribute their resources within nursery education on the basis of need. In this situation, territorial justice is likely to be promoted.

[3] In Wales, Standard Spending Assessments are not calculated on service basis.

[4] In London, the South East of England and the Isles of Scilly, additional resources are also provided to reflect higher costs in these areas.

The second factor concerns the level of central government control over local decision making. It was concluded that territorial justice is more likely to exist in situations where local authorities have a duty to provide a particular service. Nursery education is a discretionary service and as such local authorities are not governed by a legislative requirement to provide any level of service. On this basis, the achievement of territorial justice is less likely in nursery education than in services such as compulsory education. However, despite its status as a discretionary service, some form of nursery education is provided by all local authorities in England and Wales. This may be because nursery education is regarded by local authorities as a merit good. As argued by Kirby and Pinch (1983:226), merit goods often have redistributive welfare aims and are allocated on the basis of a socially defined criterion of need. Local authorities may regard nursery education as a merit good and adopt the criterion of need in the allocation of the service. There is no evidence on whether nursery education has gained merit good status or not. On the basis that local authorities have no statutory obligation to provide nursery education, it may be concluded that territorial justice is less likely to exist in nursery education than in services where local authorities have a duty to provide. However, if nursery education has the status of a merit good, then territorial justice is likely to be promoted.

It was argued above that territorial justice was most likely where local units do not have their own democratic legitimacy. On this basis, territorial justice might be more likely in health services than in services provided by local government. In England and Wales, local authorities have democratic legitimacy which provides them with the power to make decisions at a local level. Local authorities can therefore decide, in the first instance, whether to provide nursery education or not, and in the second, the amount and type of nursery education to deliver. As argued by Smith (1994b), the

capacity of local authorities to make decisions such as these can lead to diversity in the provision of nursery education. Local democratic legitimacy can therefore undermine the capacity of central government to achieve territorial justice in nursery education.

It may be the case that when the capacity to make decisions relating to the provision of services at a local level is accompanied by an absence of minimum standards, variations between areas are even more likely. Wolman (1982:193) argues that "local autonomy will result in variations among local authorities in levels of services. Despite a common citizenship, individuals will receive differing levels of services depending on where they live, a situation some would consider inequitable. In some cases these variations may be substantial, and when a national minimum is not specified, as in the United States, they may be extreme". Nursery education is subject to both of these influences, and on this basis, the opportunity for the achievement of territorial justice may be minimised.

Finally, territorial justice is more likely to exist in services where professional autonomy is strong. In these services, professional values support the adoption of a common response to need. Services for the under fives are not highly professionalised possibly as a result of "a lack of central direction and coordination by central government" and also "by fragmentation in the local delivery of services" (Penn and Riley 1992:17). It is argued that because services for the under-fives are managed locally by three local authority departments (education, social service and leisure departments), professionalism is weakened. Consequently, uniformity in professional standards, which might arise in the provision of services for the under fives, is dampened by shared responsibility. Hoggart and Shrives (1991) suggest that professionalism is weak in services for the under fives because the career

structure is less well developed than for other local authority functions, such as architecture and transport engineering. It can be argued that professionalism is likely to be stronger in the education component of under fives services than in either social service or leisure provision because these services, such as nursery schools, are provided by professionals within education departments. As such, the staff employed within nursery education are likely to be qualified nursery or primary school teachers. Staff are also likely to be members of professional associations which "have had a persistent interest in establishing similar standards in local authorities (Foster *et al* 1980:30). In addition, nursery education is subject to the same national inspection arrangements as primary and secondary education. Nursery education provided in nursery schools and classes and infant classes is therefore more professionalised than other services for the under fives. In this case, the achievement of territorial justice is more likely in the education component of under-fives services than in other services, such as day care facilities for the under-five services.

In summary, territorial justice is likely to be present in nursery education for two reasons. Firstly, as central government allocates resources to local authorities on the basis of the criterion of need, local authorities are likely to have regard for this criterion when making decisions about nursery education. Secondly, the existence of professionalism within the education component of under-fives services is likely to promote the achievement of territorial justice. Territorial justice is, however, hindered by the democratic legitimacy of local government which permits policy diversity. In addition, territorial justice is also less likely in nursery education than in other services since central government does not control local decision making. If nursery education has acquired 'merit good' status, in which the criterion of need is considered appropriate in resource allocation, territorial justice may be promoted. On the basis of these arguments, it can be argued that territorial justice is less likely to

exist in nursery education than in services where there is a statutory obligation to provide and where democratic legitimacy is weak. Territorial justice is likely to be promoted in nursery education since the criteria by which resources are allocated to local authorities are based on need and because of the existence of professionalism.

VI. Structure of this Study

This study is divided into six Chapters. Chapter two is concerned with the concept of territorial justice. The limitations of territorial justice as defined by Davies (1968) are highlighted and, where appropriate, the concept is refined and clarified. Building on the arguments advanced by Boyne and Powell (1991), this Chapter examines the validity of the statistical criterion for territorial justice put forward by Davies (1968). Is a positive correlation between need and provision always required for territorial justice? In what circumstances are other correlations required for territorial justice? In what way does a re-evaluation of Davies's (1968) criterion affect the conclusions on territorial justice drawn in existing studies? These questions are addressed by evaluating Davies's (1968) concept of territorial justice. The importance of the dimensions of need and provision in the assessment of territorial justice are highlighted. Davies's (1968) criterion of a positive correlation between need and provision for territorial justice is assessed within the context of the dimensions of need and provision. The inappropriateness of this criterion in particular situations is identified. A revised set of rules for the assessment of territorial justice is developed. These rules provide the framework within which the correlations within previous studies of territorial justice are re-examined. This analysis leads to the conclusion that previous studies have over-estimated the extent of territorial justice in education services.

Chapter three is concerned with the provision of nursery education in England and Wales. The range of nursery education provision delivered in England and Wales is outlined. The Chapter discusses the concept of service provision in terms of the aspects (inputs, outputs and outcomes) and dimensions of service provision (breadth, depth, total). The issue of quality in nursery education is also examined. A number of measures of provision are identified which embrace the aspects, dimensions and quality of nursery education. Finally, the level of nursery education provision is examined across LEA areas in England and Wales between 1981-1994. This focuses on inter-authority variations, the relationship between different indicators of provision and trends in the provision of nursery education over time. Inter-authority variations are evaluated on the basis of the average levels of provision, the coefficient of variation and the authorities with the highest and lowest levels of provision. Indicators of provision are correlated with each other to determine the nature of the relationship between nursery places and expenditure, for example. In order to identify whether the pattern of service provision is stable over time, measures of provision in one year are correlated with consecutive years. The central questions addressed in this Chapter are: What does the term 'provision' mean in the context of nursery education? How should the concept be operationalised? How has provision changed between 1981 and 1994? Which authorities are the lowest and which are the highest providers of nursery education? How much variation is there between authorities in terms of full-time and part-time provision? Is there a tendency for authorities which are high providers of nursery places to allocate high levels of expenditure per pupil and high staffing? Is there stability in the pattern of service provision over time? This Chapter is therefore concerned with the concept of service provision, the measurement of provision in nursery education and the empirical evidence on the provision of nursery education between 1981 and 1994.

In Chapter four, the need for nursery education is analysed. This Chapter focuses on the concept of need, its application in nursery education and the empirical evidence concerning the need for nursery education between 1981 and 1994. On the basis of the Bradshaw (1972) taxonomy of need, the need for nursery education services is identified. Three approaches to the identification of need in nursery education are developed. Firstly, need is defined as all children aged 3 and 4 years. Second, the definition of need is restricted to those children aged 3 and 4 years who are disadvantaged. Third, need is defined in terms of all children aged 3 and 4, with those who are disadvantaged having the greatest level of need. This latter definition therefore comprises both the first and second approaches. A number of indicators of need are developed which encompass the breadth, depth and total need for nursery education. The geographical distribution of nursery educational need across LEA areas in England and Wales between 1981 and 1994 is identified. The average levels of need for all authorities, the coefficient of variation and the authorities with the lowest and highest needs are assessed. The empirical questions which are addressed in this Chapter are: which authorities have the highest and lowest needs? How much variation is there between local authorities in terms of each of the dimensions of need? How has the need for nursery education changed between 1981 and 1994? Do authorities which have a high breadth of need also have a high depth of need? Is there stability in the geographical distribution of need for nursery education?

On the basis of the indicators of need and provision developed in Chapters three and four, Chapter five identifies the extent of territorial justice in nursery education. The indicators of nursery educational need are correlated with indicators of nursery education provision and the new rules for the assessment of territorial justice are applied to the statistical results. The application of the appropriate rule is dependent on the dimensions of need and provision which are compared. In addition, where

non-corresponding dimensions of need and provision are correlated, the application of the appropriate rule is dependent on the relationship between the breadth and depth dimensions of need. The territorial justice requirements between need and quality of service are also identified. The questions addressed in this Chapter are: What are the requirements for territorial justice in nursery education? How much territorial justice is there in the breadth, depth and total dimensions of need? How has the relationship between need and provision changed between 1981 and 1994? How do these conclusions compare with those which would have been reached had the Davies (1968) criterion of territorial justice been employed? Would the adoption of Davies's (1968) criterion of territorial justice have produced the same results? In what areas would the conclusions have been different?

The Conclusion to this study highlights its contribution to knowledge of territorial justice. This study contributes at two key levels to existing literature. Firstly, the development of a set of rules for assessing territorial justice is a significant addition to the methods used in previous studies. Secondly, this study presents new evidence on the existence of territorial justice in nursery education. Both of these issues will now be considered. Firstly, this study develops a more appropriate framework to evaluate the existence of territorial justice within a service than that established by Davies (1968). The new criteria for the assessment of territorial justice have implications for all of the studies which have empirically evaluated the existence of territorial justice. First and foremost, existing studies have applied an inappropriate criterion for assessing territorial justice. Consequently, the conclusions which have been drawn by these studies have to be considered with caution. Secondly, the empirical evidence on territorial justice has to be re-evaluated in light of the new criteria which have been developed. The application of these criteria suggests less territorial justice in the provision of education services than has previously been concluded.

The development of the rules is likely to enhance the quality of future studies of territorial justice in a number of ways. First, the new criteria for the assessment of territorial justice demand a much closer examination of the concepts of need and provision and their operationalisation than has previously been undertaken in studies of territorial justice. This may have the effect of improving the measurement of these key concepts. For example, existing studies, particularly those in education and health, focus predominantly on service inputs in the measurement of service provision. On the basis of the arguments advanced in this study, outputs, rather than inputs, are more appropriate in the assessment of territorial justice. Second, the relationship between need and quality of service provision is more likely to receive attention in future studies of territorial justice.

The second contribution of this study relates to the application of the criteria for territorial justice. These criteria have been applied to determine the extent of territorial justice in nursery education. In applying the new criteria, this study is important for two reasons. Firstly, it represents the first empirical and complete assessment of territorial justice within any service area. The application of the rules developed in this study, as opposed to the Davies (1968) criterion, mean that territorial justice between every dimension of need and provision, including quality of service, is assessed. Unlike Boyne and Powell (1993), this study does not restrict itself to the correlation of the breadth of need and the breadth of provision. Secondly, this study is the first examination of territorial justice in nursery education in England and Wales since 1976. The only two existing studies of territorial justice in nursery education are those by Blackstone (1971) and Pinch (1984). Blackstone (1971) is concerned with territorial justice prior to the implementation of the 1974 structural reforms in local government. Pinch's (1984) study examines territorial justice in pre-

school services in 1976. Both of these studies are quite dated. In terms of their findings, only Pinch (1984) found evidence of territorial justice in nursery education. The evidence is indicative of weak and moderate territorial justice. However, the adoption of a five year time-lag between need and provision variables represents a key limitation of Pinch's study. The absence of positive correlations between need and provision in Blackstone (1971) may have been influenced by the failure of the study to present a rationale supporting the inclusion of particular indicators. Indicators of need relate more specifically to the needs of adults, rather than to children of nursery age. In addition, Blackstone (1971) only examined territorial justice in one year.

This study contributes to the theory of territorial justice and its application within a service. The theory of territorial justice put forward by Davies (1968) is clarified and new criteria for the identification of territorial justice are developed. The development of the theory of territorial justice is likely to enhance the quality of future studies of territorial justice since much greater consideration has to be given to the measurement of the concepts of need and provision. The new criteria are applied within the context of nursery education services in England and Wales. Evidence of territorial justice and territorial injustice has been found.

In sum, the aim of this study is to evaluate the extent of territorial justice in the provision of nursery education across local authority areas in England and Wales 1981-1994. In the achievement of this aim, this study addressees the following key questions: Is the Davies (1968) criterion of a positive correlation between need and provision appropriate in the assessment of territorial justice? What are the limitations of this criterion? How might territorial justice be more accurately assessed? How should need and provision be operationalised within the context of nursery education? To what extent does territorial justice exist in the provision of nursery education in

England and Wales? Finally, how do these conclusions compare with those which would have been drawn had the Davies (1968) criterion of territorial justice been employed? It is to the concept of territorial justice and previous evidence in education services that this study now turns.

Chapter 2: The Concept of Territorial Justice and Previous Evidence

Introduction

This Chapter is concerned with the concept of territorial justice in nursery education in England and Wales. Part one focuses on the statistical and related issues surrounding the accurate assessment of territorial justice. In part two, Davies's (1968) concept is reformulated and a number of rules are developed in order to assess territorial justice. In part three these rules are applied to previous studies of territorial justice in education. Conclusions are drawn on the extent of territorial justice in nursery education and education services more generally.

I. The Assessment of Territorial Justice

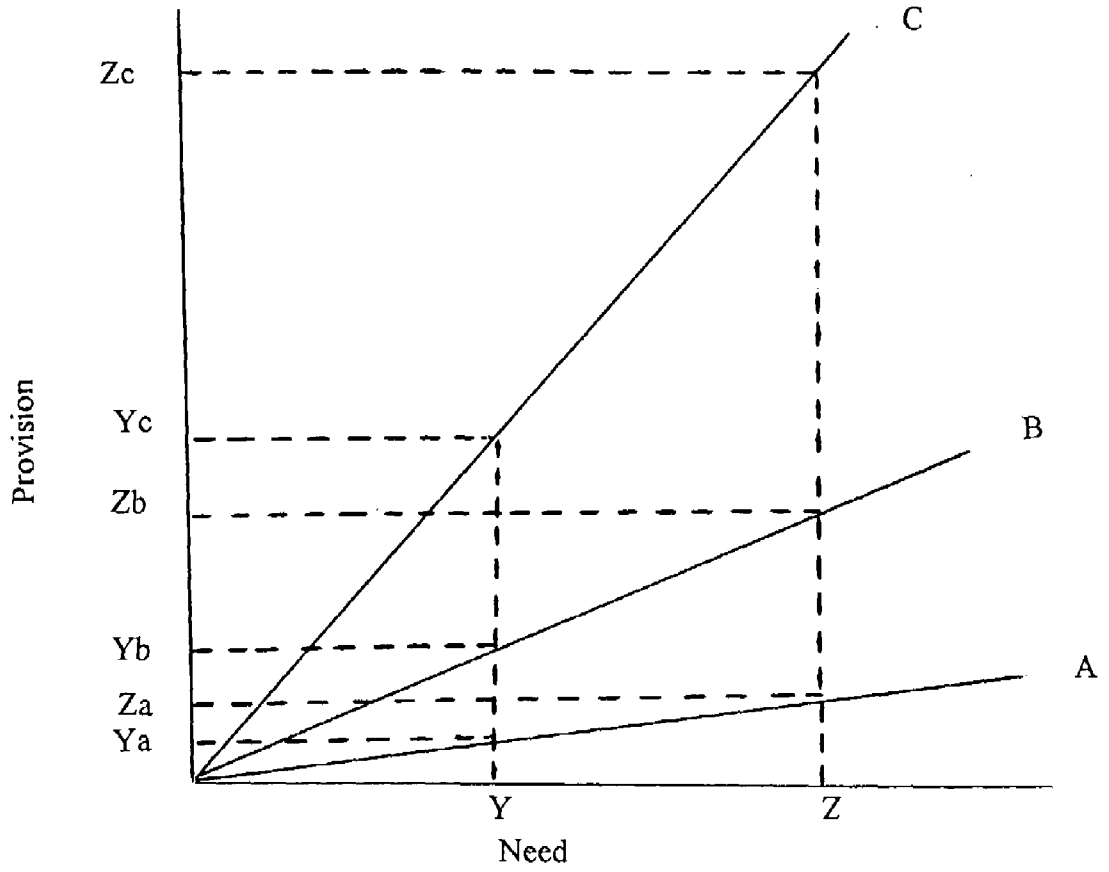
A. Key Issues

The assessment of territorial justice is based on a statistical analysis of the relationship between service need and service provision. According to Davies (1968:16), "the statistical definition of territorial justice is a high correlation between indices of resource use, or standards of provision and an index measuring the relative needs of an area's population for the service, the relative inequality of the standards indices being the same as that of the need index". Davies (1968:39) also argues that the statistical requirement for territorial justice is "a situation in which there is a perfect positive correlation between indices of standards of provision and the index measuring the relative needs of each area for the service". Correlation coefficients (which have values ranging from -1 - +1) indicate the nature of the statistical relationship between service need and service provision. As highlighted by Boyne and Powell (1993:49), Davies argues that "a perfect positive correlation is required for complete territorial justice, and a significant negative correlation indicates territorial injustice". The more positive the coefficient, the greater the level of territorial justice, and the more negative, the greater the territorial injustice. Correlation coefficients indicate

the closeness of the relationship between need and provision: the higher the coefficients, the closer the relationship between need and provision. Finally, correlation coefficients must be statistically significant to be considered valuable. The significance of correlation coefficients indicate the statistical reliability of the evidence and provides a quantitative estimate of the extent to which the results may have occurred by chance.

Boyne and Powell (1991:267) argue that the statistical definition of territorial justice is both 'too loose' and 'too restrictive'. The definition is considered too loose since "the same correlation coefficient may be produced by a variety of regression slopes". The statistical definition, a perfect positive correlation, means that territorial justice exists in each of the cases A, B and C below (Figure 1). In every case, Area Z has twice as much need and provision as Area Y. However, Davies does not indicate which of these regression slopes is more territorially just. Clearly, a resource constrained central government, for example, may prefer situation A to either B or C on the basis of cost considerations. Thus other criteria, in addition to territorial justice, are required to assist in decisions on resource distribution.

Figure 1: Rate of Response of Provision to Need



Source: Boyne and Powell (1991:268)

The statistical definition may also be considered too loose on the basis that resources and provision are treated as synonymous: a situation of territorial justice exists when resources or provision are highly correlated with need. Whilst Davies (1968:16) recognises that "the amount of resources required to achieve a certain standard can vary between areas", he, nevertheless, argues that "resources are important because they are necessary for achieving standards". There are two key issues in relation to Davies's (1968) treatment of resources and provision as synonymous. Firstly, there are three aspects within service provision, and resources, (or inputs), represent one of these. The other aspects of provision are output and impact. Provision therefore encompasses resources, and consequently, it is inaccurate to suggest that provision and resources are the same.

Secondly, resources or service inputs may not be appropriate for the assessment of territorial justice at all. Each of the components of inputs, outputs and impact measure a separate and distinctive aspect of service provision. It is necessary to identify the relevance of each of these aspects of service provision for the assessment of territorial justice. With respect to the use of service inputs in the assessment of territorial justice, the amount of money or other resources expended on a service may not be related to the service which is produced (service outputs). This is because the relationship between service inputs and service outputs is affected by factor costs and efficiency (Boyne and Powell 1991:266). Although there is likely to be a positive relationship between inputs and outputs, or resources and provision, as implied by Davies (1968), this cannot be guaranteed since the cost of production and the level of efficiency vary across local authorities and within different services. Variations in the costs of producing education services may be caused by, for example, differences in transport costs between areas. Efficiency is concerned with the ratio between resource inputs and service outputs (Hill and Bramley 1990). Efficiency levels can be improved in two ways: the same level of service may be provided for less resources; or for the same resources, a higher level of service may be provided. Efficiency levels are therefore subject to variation between areas on the basis of, for example, class sizes in education. All else being equal, a class with one teacher and thirty pupils is more efficient than one with twenty pupils since a higher level of output is produced with the same resources. Due to variations in production costs and efficiency rates, measures of service inputs may not therefore be appropriate for assessing territorial justice. Pyle (1976) argues that education services are less subject to such variations because the largest cost in education, teachers' salaries, are determined by national, and not local, pay scales. This argument may have less validity in recent years with the introduction of locally determined salary scales. Another argument against the use of inputs is that expenditure levels may not reflect the service provided. As

argued by Webster (1981:60) "expenditure has little direct meaning for consumers; what they experience are the variations in the amount and quality of service. It therefore seems preferable to use direct measures of service received or output in the analysis of distributional questions".

Kirby and Pinch (1983) argue that the impact, or outcome of a service, is relevant to territorial justice. It is not made clear why the authors take this view. However, service impact is dependent on the use and subsequent behaviour of individuals taking up the service. For example, the impact of the education service varies between individuals due to, amongst other factors, the level of attention during classes and the degree of additional work undertaken by students (Boyne and Powell 1991). The impact of a service is partially dependent on the individual and is therefore subject to variation on this basis. The adoption of service impact in the measurement of service provision would therefore only be appropriate in services where the consumption of a service was compulsory, and even in these situations, the impact of a service is dependent on an individual's subsequent behaviour. The use of service impact may not therefore be relevant in the assessment of territorial justice.

Service outputs can be taken to represent the commitment of the service provider to the provision of a service. As argued by Boyne and Powell "outputs are the most appropriate dimension of service provision for the purposes of evaluating territorial justice (1991:266). Service outputs reflect the service which is provided. On this basis, outputs can be compared between areas more easily. They are therefore relevant in the assessment of territorial justice.

In terms of the treatment of resources and provision, the Davies (1968) criterion of territorial justice is therefore more appropriately concerned with the correlation

between need and provision, not need and resources. Resources and provision are clearly not the same since resources only represent one aspect of provision. The statistical definition of territorial justice would be further enhanced if provision was measured in terms of the outputs of services rather than either inputs or impact.

In measuring service provision, the quality of services is relevant to territorial justice. As argued by Davies (1968:25) "territorial justice requires local authority conformity to a standard not only with regard to the amount of service provided but also with regard to its quality". Boyne and Powell (1991:267) also argue that "an overall measure of service standards should take both aspects into account". In measuring quality, two issues have to be addressed: the first concerns the meaning of quality and the second, its measurement. Both of these issues can be considered together. Newton and Sharpe (1977:63) argue that "all attempts to compare and evaluate [the quality of] services must resort to abstractions; not only are public services produced by a multitude of social, physical, and economic factors...but the consumption of these services by the public is, ultimately, a subjective experience which is not easily amenable to measurement of any kind". In measuring quality, a consideration of the service from the perspective of those individuals who use it is necessary (Stewart and Walsh 1990). Within this process, the issue of whether 'objective' data or the 'subjective' views of the service user should be used to determine quality of service has to be resolved. The 'subjective' views of service users can be obtained from surveys of these individuals. Whilst this represents the most appropriate means of assessing quality, where the spatial scale of the evaluation of territorial justice is wide and large scale surveys of service users are required, the approach may not be possible. As proxies of the views of users, 'objective' measures of quality can be developed by service providers. However, as recognised by Boyne

and Powell (1991), these two measures of quality may not be closely related in practice.

Boyne and Powell (1991) argue that Davies's statistical definition of territorial justice is too restrictive on two grounds. Firstly, the capacity to choose between the regression slopes presented in Figure 1 is unlikely to be available in practice. On the basis of the Davies criterion of territorial justice, local authorities are likely to judge the correlation coefficient with the highest positive value as more indicative of territorial justice. However, lower correlation coefficients may represent a situation in which provision is highly responsive to need. Secondly, the statistical definition of territorial justice imposes a linear relationship between need and provision - as the level of needs increase, a corresponding increase in the level of provision results. However, the policy of positive discrimination, which demands that additional units of need are met with higher than corresponding units of provision, does not conform to this linear relationship, yet need and provision may be statistically, but not linearly, related.

In addition to the restriction imposed by the linear relationship, the statistical definition may also be considered too restrictive on the basis that it suggests that need and provision variables should have equal variance: "...the relative inequality of the standards indices being the same as that of the need index" (Davies 1968:16). The criterion of equal variance implies that a one unit increase in need, for example, is associated with a one unit increase in service provision. In terms of a regression slope, Line C in Figure 1 represents the equal variance criterion most closely since changes in the need variable are matched by proportional changes in provision. It is not clear why Davies imposes the criterion of equal variance in the assessment of territorial justice. There are a number of problems with the criterion. Firstly, on the

basis of the positive correlation criterion, territorial justice is also represented by situations A and B in Figure 1 although there is not equal variance in the need and provision variables. Secondly, positive discrimination, as already discussed, does not require equal variance in need and provision - in fact the policy demands unequal variance. Boyne and Powell (1993) argue that the criterion of equal variance has not been applied in previous studies of territorial justice. Thus it can be concluded that the criterion of equal variance is not necessary for the achievement of territorial justice.

This discussion has highlighted some of the key statistical difficulties with the concept of territorial justice. As defined by Davies (1968), the concept is both too loose and too restrictive at the same time. Whilst some of these problems cannot be resolved, the definition of territorial justice can be improved. Firstly, in terms of its *'looseness'* the concept of territorial justice is more appropriately concerned with the correlation between needs and provision, and not needs and resources. In addition, service provision measured on the basis of service outputs provides the most appropriate indicator of the service delivered. Secondly, the *'restrictiveness'* imposed by the criterion of equal variance can be removed from the consideration of territorial justice.

B. The Dimensions of Need and Provision

Davies (1968) specified that a perfect positive correlation between need and provision was necessary for territorial justice. However, Davies fails to consider the central issue of the dimensions of service need and service provision in assessing territorial justice. The requirement to make comparisons between corresponding dimensions of need and provision represents the first of Boyne and Powell's (1991) conditions for an accurate assessment of territorial justice. The breadth, depth and total dimensions of need must be compared with indicators of the breadth, depth and

total dimensions of service provision. These dimensions of need and provision are now discussed.

There are three dimensions within the concept of need: breadth, depth and total. Drawing on Davies (1978), Boyne and Powell (1991:265) argue that "total need may be thought of as being composed of the number of individuals who are 'in need' multiplied by their average level of need". On this basis, total need is therefore the breadth of need (number of individuals in need) multiplied by the depth of need (their average level of need). Boyne and Powell's (1991) interpretation of Davies (1978) is helpful in clearing up some of the confusions expressed by Davies on this issue. Davies (1978:233) states that:

"a need indicator is an estimate of the amount of resources appropriate to some (defined) population of these recipients. It is the sum of the resources judged to be appropriate for each individual in that population".

Davies (1978:233) also argues that:

"the definition of the need indicator that we have just presented is for a total population weighted by the resources judged appropriate to each of its members".

The need indicator referred to by Davies (1978) in the above extracts is Boyne and Powell's (1991) concept of total need. There are two key problems with the definitions of total need put forward by Davies (1978) which Boyne and Powell (1991) have clarified. Firstly, Davies (1978) states that total need may expressed in terms of the resources required to fulfill the needs. Total need, as put forward by Boyne and Powell (1991), is more appropriately concerned with the number of individuals in need multiplied by the intensity of need. Although Boyne and Powell (1991) do not justify why they interpret Davies's (1968) view of total need in terms of numbers of individuals in need, rather than as Davies (1968) implies, the amount

of resources, needs are more appropriately expressed in terms of individuals. This is because the expression of needs in terms of the resources required is only appropriate where the value of resources is the same. For example, where total need is calculated as £100 in areas A and B, the allocation of this amount to each of the areas may have a different influence on total need. In area A, the value of the resources might be able to produce more than £100 worth of services required to meet total need due to the low cost of services in this area. In contrast, in area B, where services cost more, the resources might not have sufficient value to meet total need. The expression of total need in terms of resources therefore suffers from the problems already identified with the use of service inputs in assessing territorial justice - resources do not equate with need in the same way as resources are not synonymous with provision.

The second difficulty with Davies's (1978) definitions of total need is that there is some conflict in terms of whether total need is represented by "the sum of" or "weighted by" the breadth and depth of need. Clearly the former suggests that a measure of total need is obtained when the breadth of need is added to the depth of need, and the latter, that breadth and depth of need are multiplied. Boyne and Powell (1991) adopt the strategy of multiplying breadth and depth of need to produce total need. This approach appears to be more appropriate than one based on adding breadth and depth. Thus, in the following example presented in Table 2.1, Area A has double the breadth of need of Area B, whilst at the same time, has only half of the depth of need as Area B. If total need is calculated by adding breadth and depth, Area A, despite its low depth, has almost double the total need of Area B. The effect of adding breadth and depth is that the dimension of need which has the highest value has the greatest influence on the total need figure. In the example, breadth clearly has the strongest influence on the total need figure. In contrast, when breadth and depth are multiplied, both dimensions have more of an equal influence on the total need

figure. In the example, Area A and Area B have the same level of total need (200). The expression of total need in terms of breadth multiplied by depth of need seems more appropriate than one in which breadth and depth of need are added.

Table 2.1: Calculating Total Need

	Breadth of Need	Depth of Need	Total Need	
			Addition	Multiplication
Area A	100	2	102	200
Area B	50	4	54	200

In terms of the meaning of the breadth and depth of need, as recognised by Boyne and Powell (1991:265), the breadth of need is "relatively easy to assess". Breadth of need (BN) relates to the number of individuals in a particular need category. The breadth of need for education might be measured as 'number of children aged 5-16 years'. In this example, breadth of need is assessed on the basis of a 'head-count' of these individuals. Alternatively, breadth of need may be represented by the proportion of the population who fall into a particular category of need, for example, the '% of the population aged 5-16 years'. Depth of need (DN) concerns the intensity of need (Boyne and Powell 1991). The 'proportion of children aged 5-16 living in overcrowded households', for example, provides a depth measure of need (assuming that children in overcrowded households have a higher level of need for education than children who do not live in these circumstances). This indicator represents a measure of the depth of need on the basis that of all those children aged 5-16, those children who live in overcrowded households have the greatest need. Depth of need focuses on the proportion of the need population with particular need characteristics.

The identification of these characteristics is problematic since judgements about what constitutes need within a service have to be made. In education, for example, if it is argued that some children have a higher level of need than other children, the nature of these need circumstances have to be identified. As recognised by Bennett (1982:133) "it may be difficult to assess what constitutes need within any particular service category". Although the measurement of the breadth of need involves some judgements about "what constitutes need", breadth of need, by its very nature, is less concerned with the particular need circumstances of individuals. The measurement of depth of need involves key judgements about these circumstances. This issue is developed when the measurement of need in nursery education is examined (Chapter four). As argued above, total need (TN) is the breadth of need multiplied by the depth of need.

Service provision also has these three dimensions. Breadth of provision (BP) refers to the total number of individuals, or proportion of the population, in receipt of a service, for example, 'the number of primary and secondary school places per 1,000 population'. Indicators such as this represent measures of outputs and, as discussed above, are the most appropriate aspect of service provision in the assessment of territorial justice. The second dimension of provision is depth of provision (DP) which is concerned with the amount of service received by pupils. This dimension of provision is commonly expressed in terms of service inputs eg. 'expenditure per pupil', or 'pupil teacher ratio'. The difficulties associated with the use of input indicators of service provision such as these have already been highlighted. More appropriate measures of the depth of provision would encompass outputs rather than inputs. However, it is not possible to use indicators of outputs which are also measures of the depth dimension of provision. The reason for this is that indicators of the output aspect of any service are limited to the measurement of the school places delivered, or

hospital beds provided, for example. The difficulty which emerges in attempting to obtain depth measures of these outputs is that the indicator becomes meaningless - the indicator of depth of provision becomes the school place or the hospital bed. For example, number of school places per pupil - within this measure, the indicator is likely to be the same as each pupil will hold a place. In the assessment of depth of provision, a unit by which to express the characteristics or features of the amount of service per pupil is therefore required. The unit of resources is invariably adopted in the absence of any other unit in calculating the amount of service per pupil. Thus measures of the depth dimension of provision have to be expressed in resource terms. Total provision (TP) reflects both the breadth and depth dimensions of service provision. Expenditure on primary and secondary schools per capita provides a measure of total provision. Since depth of provision is expressed in resources, total provision is also likely to be based on resource, or input, indicators. Measures of the depth and total dimensions of provision are therefore likely to be expressed in terms of the resources spent. The limitation of these measures of the input aspect of service provision must be recognised in the interpretation of evidence on territorial justice.

This section of the Chapter has examined the dimensions of need and provision. The concept of total need, put forward by Davies (1978), and later clarified by Boyne and Powell (1991) has been discussed. Although Boyne and Powell clarified the issue of total need, the authors did not develop a rationale supporting the interpretation of Davies's concept. This rationale has now been presented. Total need is concerned with individuals in need and not the resources required to fulfill these needs since resources may not match needs. A measure of total need is obtained by multiplying the breadth and depth dimensions of need. The discussion above has also clarified the distinctions between the dimensions of need and provision. More specifically, it has been argued that breadth of need refers to the number of individuals who fall into a

category of need and depth of need relates to those individuals within this group who possess particular need characteristics. Similarly, the breadth of provision concerns the number of individuals receiving a service and the depth of provision, the proportion, or the amount of service, obtained by individuals. Total provision encompasses both the breadth and depth dimensions of provision. In the measurement of the depth of provision, indicators of service inputs, for example, expenditure per pupil have to be used to quantify the amount of service. Consequently, measures of total provision are also expressed in resource terms.

II. The Relationships Required for Territorial Justice: Rules on Territorial Justice

Prior to an examination of previous studies, it is necessary to establish the statistical relationships between need and provision which are required for territorial justice. Davies (1968) argued that a positive correlation between need and provision was required for territorial justice. This criterion was unchallenged until Boyne and Powell's (1991) review of the theory and evidence of territorial justice. Boyne and Powell (1991) examine whether a positive relationship between need and provision is always required for territorial justice. The authors argue that territorial justice requires a positive correlation between need and provision when: corresponding dimensions of need and provision are compared (where the breadth of need is compared with the breadth of provision, for example); or in situations where the relationship between the breadth and depth dimensions of need is strongly positive. Where the correlation between the breadth and depth of need is uncorrelated, Boyne and Powell (1991) argue that territorial justice does not require a strong positive correlation between need and provision. The authors suggest that, in these situations, a moderate correlation is required for territorial justice. In situations where there is a close negative correlation between the breadth and depth of need, territorial justice requires "no significant relationship" between need and provision. The requirements

of territorial justice will now be examined and a number of rules for assessing territorial justice will be presented. The development of this set of rules to assess territorial justice represents a significant reformulation of the statistical requirements for territorial justice established by Davies (1968) and a development of the contribution made by Boyne and Powell (1991).

As suggested by Boyne and Powell (1991), a positive correlation between need and provision is appropriate in situations where corresponding dimensions are compared - a positive correlation must exist between corresponding indicators of need and provision. Thus territorial justice requires a positive correlation between: the breadth of need and the breadth of provision; the depth of need and the depth of provision; and total need and total provision. A positive correlation between corresponding dimensions of need and provision is the first of the seven rules on territorial justice identified in this study.

Rule 1: A Positive Significant Correlation Between Corresponding Dimensions of Need and Provision

Whilst a positive correlation between need and provision indicates territorial justice when corresponding dimensions are compared, a positive relationship may not be required if non-corresponding dimensions are employed. In a situation where the breadth of need is compared with the depth of provision, a perfect positive correlation is not appropriate for territorial justice. A positive correlation would imply that the depth of provision, or the amount of service received per individual child, for example, increases in response to rises in the breadth of need, the proportion of children in need of a service. However, it is not equitable if depth of provision is positively related to the breadth of need. It is unfair for additional nursery education places, for example, to be provided if the level of need per individual child increases.

Thus the Davies criterion is inappropriate where the breadth of need is compared with the depth of service provision. The necessary statistical relationship between need and provision for territorial justice in these circumstances is insignificant: provision per client should neither rise nor fall as the proportion of the population in need varies.

In situations where the depth of need is correlated with the breadth of provision, territorial justice does not require a positive correlation between need and provision. A positive correlation is inappropriate because increases in the depth of need should not be responded to with additional breadth of provision. The necessary statistical relationship between the depth of need and the breadth of provision for territorial justice is also an insignificant correlation: increases in the depth of need should not lead to increases in the breadth of provision. Thus in situations where BN and DP or DN and BP are compared, the nature of the statistical relationship between need and provision for territorial justice should be insignificant.

An insignificant correlation between the breadth and depth of need means that across areas, the breadth and depth of need are not related to each other. Areas with high breadth of need are no more likely to have a high depth of need than they are to have a low depth of need. If the correlation between the breadth and depth of need is insignificant, territorial justice requires an insignificant correlation between specific dimensions of need and provision. Rule 2 is presented below:

Rule 2: Territorial justice requires an insignificant relationship between BN and DP and between DN and BP if BN and DN are insignificantly related to each other.

Boyne and Powell (1991) did not consider the correlation of BN and DN in situations where the relationship between the dimensions of need was uncorrelated. The development of rule 2 therefore advances the knowledge on territorial justice beyond that suggested in Boyne and Powell (1991).

Boyne and Powell (1991:277) examined the existence of an insignificant, or uncorrelated, relationship between the breadth and depth of need, but only in terms of total need and total provision. The authors argue that:

"if BN and DN are uncorrelated, the relationship between non-corresponding measures of need and provision would indicate much less territorial justice. For example, the relationship between BN and TP might be moderate at best."

This suggests that territorial justice requires a moderate relationship between non-corresponding dimensions of need and provision in situations where the correlation between the breadth and depth of need is uncorrelated. This requirement will be reviewed below when each of the situations is discussed.

Where the correlation between the breadth and depth of need is insignificant, territorial justice also requires a positive correlation between specific dimensions of need and provision. There are four situations in which this applies. In the first, where the breadth of need is compared with total provision, the relationship between the two should be positive for territorial justice. An increase in the breadth of need should have a positive effect on total provision to reflect the increase in the breadth of need. Since the breadth and depth of need are insignificantly related with each other, a positive correlation between the breadth of need and total provision is appropriate for territorial justice. Thus where the dimensions of need are insignificantly related to each other, territorial justice requires a positive correlation between BN and TP.

Secondly, where the depth of need is compared with total provision, territorial justice also requires a positive correlation. This is because increases in the depth of need should be reflected in increases in the depth dimension of provision. The breadth dimension of provision should have not changed because of the insignificant correlation between the breadth and depth of need. Thus where the dimensions of need are insignificantly related to each other, territorial justice requires a positive correlation between DN and TP.

In the third situation, territorial justice also requires a positive correlation between total need and the breadth of provision in situations where the breadth and depth of need are insignificantly related to each other. This is because increases in the level of total need should be positively associated with increases in the breadth of provision to reflect increases in the breadth, but not the depth dimension of need. Thus where TN and BP are compared, a positive correlation is required for territorial justice when the dimensions of need are insignificantly related to each other.

Finally, territorial justice also requires a positive correlation between total need and the depth of provision. Increases in the level of total need should be positively associated with increases in the depth dimension of service provision. Thus, where TN and DP are compared, a positive correlation is required for territorial justice when the dimensions of need are insignificantly related to each other.

In each of the above four situations, territorial justice requires a positive correlation between specific dimensions of need and provision. An insignificant correlation between the breadth and depth dimensions of need underpins the positive relationship which territorial justice requires between specific dimensions of need and provision.

In each situation, total provision is correlated with the breadth or depth of need, or total need is correlated with the breadth or depth of provision. This leads to a third rule:

Rule 3: If BN and DN are insignificantly correlated with each other, territorial justice requires a positive correlation between BN and TP, DN and TP, TN and BP and TN and DP

Territorial justice therefore requires a positive relationship between specific dimensions of need and provision in situations where the breadth and depth of need are not related. Since the breadth and depth of need are not related, all of the positive correlation which is required for territorial justice is therefore a function of the other dimension. For example, the correlation between the breadth of need and total provision should be positive for territorial justice in the same way as a positive correlation is required between the breadth of need and the breadth of provision. Thus correlation between BN and TP in situations where the breadth and depth of need are not related is the same in territorial justice terms as the correlation of the corresponding dimensions of BN and BP. Boyne and Powell's (1991) suggestion that the strength of the correlation need only be moderate is therefore inappropriate. Territorial justice requires a positive correlation between non-corresponding dimensions of need and provision in situations where the relationship between the breadth and depth of need is insignificant.

Whilst the relationship between the breadth and depth of need may be uncorrelated, these dimensions may also be positively related to each other. Boyne and Powell (1991) argue that if it is assumed that BN and DN are strongly positively related to each other, then the Davies criterion for territorial justice, a perfect positive correlation between need and provision, will be required in every situation. The

acceptance of this assumption implies that an area with a high proportion of its population in need of a service is one in which the intensity of the need is also high. Where breadth and depth of need are positively related, total need will also be high (TN = BN X DN). As all three dimensions of need are therefore positively correlated, then any dimension of need can be compared with any dimension of service provision, and a positive correlation between need and provision is required for territorial justice.

The extent to which a positive relationship actually exists between the breadth and depth of need within any service has to be considered prior to developing a framework for interpreting correlation coefficients. The assumption that breadth and depth of need are positively correlated means that in areas where a large proportion of the population is in need of a service, there is a high level of need per individual. This implies that need is concentrated in particular areas - where there is a high breadth of need, there is also a high depth of need (and vice-versa). In this situation, territorial justice requires a positive correlation between all dimensions of need and provision to reflect the positive relationship between the dimensions of need.

The purpose of identifying the correlation between the breadth and depth of need is that these dimensions can act as proxy indicators for each other in situations where non-corresponding dimensions of need and provision are compared. This means, for example, where breadth and depth of need are strongly correlated, in situations where depth of need is compared with the breadth of provision, territorial justice requires a positive correlation. In this example, the depth of need is used as a proxy indicator of the breadth of need to enable the correlation of the non-corresponding dimensions of the depth of need and breadth of provision. The strength of the correlation between the dimensions of need determines the reliability and closeness of the proxy indicator

to the actual indicator. In situations where the correlation between the breadth and depth of need is strongly positive, it may be concluded that one dimension of need is a reliable proxy of the other dimension. A positive correlation between the breadth and depth of need insufficient - the correlation between these dimensions of need must be strongly positive. Rule 4 applies in situations where the correlation between the breadth and depth of need is strongly positive. As the breadth and depth are correlated in this way, any dimension of need may be correlated with any dimension of provision. Territorial justice therefore requires a positive correlation between need and provision.

This leads to a fourth rule:

Rule 4: If BN is strongly positively correlated with DN, territorial justice requires a positive significant correlation between any dimension of need and any dimension of provision;

Whilst it is possible to make the assumption that breadth and depth of need are positively related, it may also be the case that they are negatively correlated. A strong negative correlation between the breadth and depth of need means that in situations where the breadth of need is compared with the depth of provision, or the depth of need is compared with the breadth of provision, territorial justice requires a negative correlation. This means that areas which have a high breadth of need have low depth of need and vice versa. As the two dimensions of need are strongly negatively related, where the breadth of need is compared with the depth of provision, territorial justice requires a negative correlation. Similarly, where the depth of need is compared with the breadth of provision, territorial justice also requires a negative correlation. To clarify, where the breadth of need is correlated with the depth of provision, a strong negative correlation is required for territorial justice so that the relationship

between the depth of need and the depth of provision is positive. In this situation, breadth of need acts as a proxy for the depth of need. The proxy, however, is not positively, but inversely related with the relevant dimension of need. The strength of the negative correlation between the breadth and depth of need determines the extent to which the breadth or the depth of need is a reliable proxy indicator of the other dimension of need. Where the correlation between the breadth and depth of need is strongly negative, territorial justice requires a negative correlation between the breadth of need and depth of provision and the depth of need and breadth of provision. This is rule 5 on territorial justice:

Rule 5: if BN is strongly negatively correlated with DN, territorial justice requires a negative correlation between BN and DP and DN and BP;

A negative correlation would also suggest that areas which have a high breadth of need have a low depth of need (and vice-versa). In this situation, as argued by Boyne and Powell (1991:277), "total need may be roughly uniform across areas" as some areas may have high breadth of need whilst other areas will have high depth of need. The negative correlation between these dimensions means that the high breadth and low depth of need, or the low depth and high breadth of need, effectively cancel each other out. The purpose of identifying the correlation between the breadth and depth of need is to identify the extent to which they cancel each other out. This differs from rules 4 and 5 where the correlation between the breadth and depth of need was required to enable one dimension to act as a proxy for the other. In rule 6, territorial justice does not require either the breadth or the depth of need to be significantly correlated with total provision. Instead an insignificant correlation is required for territorial justice in situations where the breadth or depth of need is compared with total provision.

Rule 6: If BN is strongly negatively correlated with DN, territorial justice requires an insignificant relationship between BN and TP and between DN and TP;

The issue of quality in nursery education has not yet been considered in terms of its requirements for territorial justice. Quality of service ought not to vary with need. As the level of need for a service increases or decreases, the quality of service should remain constant. Children in high need should receive the same quality of service as children in low need. The quantity of service provision per child should vary according to need, but not the quality. In statistical terms, territorial justice therefore requires an insignificant relationship between all dimensions of need and the quality of service provision. Positive and negative correlations between need and the quality of service indicate territorial injustice. This leads to a seventh rule:

Rule 7: Territorial Justice requires an insignificant correlation between all dimensions of need and quality of service provision;

It is necessary at this stage to summarise these complex issues in relation to the assessment of territorial justice. The Davies criterion for territorial justice was a perfect positive correlation between need and provision. This criterion cannot be universally applied as suggested by Davies (1968). A positive correlation between need and provision is only appropriate where: corresponding dimensions of need and provision are correlated (rule 1); specific dimensions of need and provision are compared in which the correlation between the breadth and depth of need is insignificant (rule 3); or where specific dimensions of need and provision are compared where the correlation between the breadth and depth of need is positive (rule 4). A positive correlation between need and provision is not required for territorial justice in other instances. An insignificant relationship between appropriate dimensions of need and provision is required for territorial justice on the basis of rules 2, 6 and 7. Rule 5 requires a negative correlation between specific dimensions of

need and provision. In order to determine the existence of territorial justice, it is necessary to consider the dimensions of need and provision which are being compared, and the strength and direction of the correlation between the breadth and depth dimensions of need.

These rules build on Boyne and Powell's (1991) framework in a number of ways. Firstly, a detailed rationale supporting Boyne and Powell's (1991) interpretation of Davies's (1968) concept of territorial justice has been put forward. The territorial justice requirements of particular correlations between need and provision which were not included in Boyne and Powell (1991) have been outlined. These relate to the correlations contained within rule 2 (between BN and between DP and between DN and BP) and rule 7 concerning the quality of service. In addition, the requirements for territorial justice when non-corresponding dimensions of need and provision are correlated (rule 3) have been clarified. Secondly, the rules specify the territorial justice requirements of all possible correlations between need and provision, including the quality of service provision. These rules are presented as an alternative to the Davies (1968) criterion on territorial justice. The rules provide a framework within which the level of territorial justice can be determined, both within previous studies, and in the interpretation of the evidence produced in this study. These rules are re-presented in Table 2.2 below:

Table 2.2: Rules for Assessing Territorial Justice

Territorial Justice Requires:

Rule 1: Positive significant correlation where corresponding dimensions of need and provision are compared;

Rule 2: Insignificant correlation between BN and DP or between DN and BP if BN and DN are insignificantly related to each other;

Rule 3: Positive correlation between BN and TP, DN and TP, TN and BP and TN and DP if BN and DN are insignificantly related to each other;

Rule 4: Positive correlation between any dimension of need and any dimension of provision if BN is strongly positively correlated with DN;

Rule 5: Negative correlation between BN and DP and DN and BP if BN is strongly negatively correlated with DN;

Rule 6: Insignificant relationship between BN and TP and between DN and TP if BN is strongly negatively correlated with DN;

Rule 7: Insignificant correlation between any dimension of need and quality of service provision;

Key:

BN= Breadth of Need
DN= Depth of Need
TN= Total Need
BP= Breadth of Provision
DP= Depth of Provision
TP= Total Provision

This Chapter now moves on to examine evidence on the relationship between need and provision within education services in England and Wales. The rules developed in

this section will be applied, where appropriate, to previous studies to determine the extent of territorial justice.

III. Territorial Justice - Previous Studies in Education

Few studies are explicitly concerned with the issue of territorial justice, although there are a number of studies which examine the relationship between service need and provision. While not specifically focused on territorial justice, these studies do assess the relationship between service need and service provision and therefore provide evidence on territorial justice. As noted in Chapter one, previous studies have examined the relationship between need and provision across a wide range of public services, including education. Only the study by Blackstone (1971) is explicitly concerned with nursery education, although Pinch (1984) includes nursery education in his study of pre-school provision. There is therefore insufficient existing research on territorial justice in nursery education to focus on this area alone. Ideally, one would wish to examine studies of territorial justice in services which are very similar to nursery education. However, no service is exactly the same as nursery education, either because it is mandatory for local authorities, or because the service is not provided within the same policy making environment as nursery services. Studies of territorial justice in education services generally can be examined. Although nursery education is discretionary, the service embodies much of the features of education services generally, such as the provision of education places and the employment of teachers. In addition, nursery education is provided within the same policy making arena as education services more generally. Thus the Department for Education and Employment, local authorities, school governors, head teachers and the inspection bodies are responsible for the delivery and monitoring of nursery services in the same way as they are in the primary school sector, for example. On this basis, therefore, studies which examine the level of territorial justice within other education services

provide the most appropriate comparison for nursery education. This Chapter now moves on to discuss evidence on the level of territorial justice within nursery education, and education services more generally.

A. The Dimensions of Need and Provision within Previous Studies

One of the most apparent deficiencies within previous studies is the lack of recognition of the dimensions of need and provision. As a consequence, all of the previous studies have assessed territorial justice on the basis of the Davies (1968) criterion: a perfect positive correlation. However, as shown above, this criterion is not appropriate unless one of the following three conditions have been satisfied: corresponding dimensions of need and provision are compared (rule 1); or the correlation between the breadth and depth of need is insignificant (rule 3); or the correlation between the breadth and depth of need is strongly positive (rule 4). In order to make a complete assessment of territorial justice, it is necessary to classify the measures of need and provision used by the authors into the dimensions of breadth, depth and total so that the rules which have been developed on territorial justice can be applied. Conclusions on the level of territorial justice which have been drawn on the basis of the Davies (1968) criterion will be compared with those using the rules which have been developed above.

A1. Classifying Measures of Need and Provision

It is first necessary to classify indicators of need and provision used in the previous studies into the dimensions of breadth, depth and total (see Table 2.3). All of the indicators of need used in the studies have been classified as indicative of the breadth of need on the basis that they refer to the proportion of the population in need of education services. None of the indicators within previous studies measure the depth or intensity of need for education. In terms of the breadth indicators used, a number

of the studies adopt indicators of the '% of the population of school age' (Davies 1968, Boaden 1971, Sharpe and Newton 1984). The majority of studies include measures which relate to the proportion of the population in particular need circumstances, for example, proportion of the male population in Social Classes IV and V (Boaden 1971, Danziger 1978 and Jesson et al 1985), and the % of the population born outside the UK (Howick and Hassani 1979, 1980, Jesson et al 1985). These measures have been classified as indicators of the breadth of need since they refer to the circumstances of the population in general and not the particular needs of the school age population. Had these measures been specific to the needs of individual children, they would have been classified as indicative of the depth of need. None of the studies provide measures of the total dimension of need. Such a measure would encompass the size of the school population together with the intensity of need in this group.

Table 2.3: Previous Evidence of Territorial Justice in Education Services

Study	Areas & Time Period	Need Measure	Dimension	Provision Measure	Dimension	Territorial Justice Davies criterion
Davies 1968	County Boroughs 1949-1965	1. prop. male pop. in semi/ unskilled occupations	Breadth	a.expenditure per primary pupil	Depth	1a. unpatterned 2a. unpatterned
		2.prop. of pop. in poor housing conditions	Breadth	b.expenditure per 1000 population (primary)	Total	3a. injustice 4a. weak
		3. % age 5-11/11-18 years	Breadth			1b. strong
		4.% pop. born in New Commonwealth	Breadth	c.expenditure per secondary pupil	Depth	2b. weak 3b. strong 4b. injustice
				d.expenditure per 1000 population (secondary)	Total	1c. injustice 2c. injustice 3c. injustice 4c. injustice 1d. weak 2d. unpatterned 3d. moderate 4d. weak
Boaden 1971	County Boroughs 1965	1.total population (size)	Breadth	a.expenditure per 1000 population	Total	1a. weak
		2.% age 5-14 years	Breadth			2a. strong
		3.% pop. in social class IV and V	Breadth			3a. moderate
Blackstone 1971	Administrative Counties 1965	1.% economically active females	Breadth	a.maintained provision per 1000 children aged 2-4 years	Breadth	1a. unpatterned
		2. % of pop. with excl. use of amenities	Breadth			2a. unpatterned
	County Boroughs 1965					1a. unpatterned 2a. unpatterned

Study	Areas & Time Period	Need Measure	Dimension	Provision Measure	Dimension	Territorial Justice Davies criterion
Alt 1971	County Boroughs 1958-1968	1.population size	Breadth	a.expenditure per 1000 population	Total	1a. moderate
Danziger 1978	County Boroughs 1958-1970	1.pupils per 1,000 pop.	Breadth	a.expenditure per capita	Total	1a. strong
		2.% male pop. in social class IV and V	Breadth			2a. weak
		3.% males with leaving school age of 15/20 years	Breadth	b.expenditure per pupil	Depth	3a. weak 4a. moderate
		4.proportion of immigrants	Breadth			5a. weak
		5.% of pop. lacking excl. use of amenities	Breadth			1b. strong 2b. unpatterned 3b. unpatterned 4b. unpatterned 5b. unpatterned
Howick and Hassani 1979	English LEAs 1976	1.proportion of immigrants	Breadth	a.expenditure per primary pupil	Depth	1a. moderate
		2.prop. overcrowding housing	Breadth			2a. weak
		3.prop. unskilled workers	Breadth			3a. unpatterned
		4.prop. families with 4 or more children	Breadth			4a. unpatterned
		5.prop. single parent families	Breadth			5a. weak
Howick and Hassani 1980	English LEAs 1976-1977	1. proportion of immigrants	Breadth	a.expenditure per secondary pupil	Depth	1a. moderate
		2. prop. overcrowding housing	Breadth			2a. weak
		3. prop. unskilled workers	Breadth			3a. unpatterned
		4. prop. families with 4 or more children	Breadth			4a. unpatterned 5a. weak
		5. prop. single parent families	Breadth			6a. injustice
		6. % residents with low income	Breadth			

Study	Areas & Time Period	Need: Measure	Need: Dimension	Provision: Measure	Provision: Dimension	Territorial Justice: Davies criterion
Pinch 1984	English LEAs	1. % employed married women with children	Breadth	a.nursery school & class places per	Breadth	1a. weak
	1976	2. % single parent families	Breadth	1000population		2a. moderate
		3. % unskilled workers	Breadth			3a. moderate
				b.reception class places per 1000 population	Breadth	1b. moderate 2b. weak 3b. weak
Sharpe and Newton 1984	County Boroughs 1960, 1972	1.% of pop. of school age	Breadth	a.exp. per capita b.exp. per pupil	Total Depth	1a. strong 1b. injustice
	County Councils					1a. weak 2b. injustice
Jesson *et al* 1985	English LEAs 1981	1.% 'poor economic conditions 2. % of households with head in social class IV and V	Breadth Breadth	a.exp. per pupil b.pupil teacher ratio	Depth Depth	1a. strong 1b. moderate 2a. weak 2b. weak

In relation to the classification of indicators of education provision, indicators of the breadth of provision are the number of nursery school and class places per 1,000 3 and 4 year olds (Blackstone 1971), or per 1,000 population (Pinch 1984). These measures provide an indication of the proportion of the client group for whom services are available. Where indicators reflect the level of service per pupil, they are classified as depth measures. The depth of education provision is represented in the studies by 'expenditure per pupil' (Davies 1968, Danziger 1978, Howick and Hassani 1979, 1980, Sharpe and Newton 1984 and Jesson et al 1985), and pupil teacher ratio (Jesson et al 1985). Indicators of total provision are expenditure per capita (Danziger 1978, Sharpe and Newton 1984), or expenditure per 1,000 population (Davies 1968, Boaden 1971 and Alt 1971). Both of these measures are classified as total provision since they reflect both the breadth and depth dimensions of education provision. Thus the number of school places (breadth of provision) has been multiplied by expenditure per pupil (depth of provision) and the total either divided by the population (per capita) or per 1,000 of the population.

A2. The Evidence

Table 2.3 provides a summary of evidence on the nature of the relationship between need and provision across a range of education services. The Table presents the studies, the areas and time period to which they relate and the measures and dimensions both need and provision adopted within the studies. The extent of territorial justice found in the studies on the basis of the Davies (1968) criterion is also presented.

The classifications below have been used to summarise the correlation between indicators of need and provision found in the studies. It is recognised that whilst this

framework is only appropriate where corresponding dimensions of need and provision are compared (rule 1 applies), it provides a useful means by which the correlations in the studies can be classified [5].

'injustice' if the relationship between need and provision is significantly negative
'unpatterned' if the coefficient is not significantly different from zero and the 0.05 level
'weak' territorial justice if the coefficient is positively significant but less than 0.30
'moderate' territorial justice if the coefficient is positively significant, greater than 0.30 but less than 0.60
'strong' territorial justice if the coefficient is positively significant and above 0.60

source: Boyne and Powell (1991:269)

It is possible to examine the conclusions drawn in each of the studies on the basis of the Davies (1968) criterion of territorial justice. As indicated in Table 2.3, many of the studies find evidence of territorial justice in the provision of education services. Some evidence of strong territorial justice is provided in a number of the studies (Davies 1968, Boaden 1971, Danziger 1978, Sharpe and Newton, 1984 and Jesson et al 1985). In three of these studies where strong correlations are obtained, need is represented by the population of school age (Boaden 1971, Danziger 1978 and Sharpe and Newton 1984). A number of other correlations tested in the studies indicate evidence of a moderate and weak relationship between education need and provision (eg. Pinch 1984, Jesson et al 1985). Some of the correlations tested by Davies (1968), Howick and Hassani (1980) and Sharpe and Newton (1984) also find evidence of territorial injustice. Blackstone (1971) is the only study which finds no evidence of either territorial justice or injustice in education services. All of the relationships tested in this study are unpatterned. Across all of the studies, weak correlations between need and provision are the most common relationship. This is

[5] This framework is deemed appropriate in the determination of the strength of the correlation coefficients where all of the rules apply (Chapter five).

closely followed by moderate and strong correlations. An unpatterned relationship between need and provision is also represented in the studies. On the basis of the Davies criterion of territorial justice, it can be concluded that the studies overall find weak-moderate evidence of territorial justice.

The conclusion that weak-moderate evidence of territorial justice exists in education services is based on the premise that positive correlations between need and provision are required for territorial justice. However, unless corresponding dimensions of need and provision have been compared (rule 1), or an assumption that the correlation between the breadth and depth dimensions of need and provision is insignificant (rule 3) or strongly positive (rule 4), positive correlations do not indicate territorial justice. Since the correlation between the breadth and depth of need cannot be assumed to be insignificant or positive, the conclusion that a weak-moderate level of territorial justice exists is premature.

In order to reach firmer conclusions, it is necessary to apply the rules which have been developed in this study to previous evidence. Only rules 1 and 2 can been applied to the evidence. Rule 1 may be applied where corresponding dimensions of need and provision are compared. Rule 2 is relevant in situations where the breadth of need is compared with the depth of provision, or the depth of need is correlated with the breadth of provision. The relationship between these dimensions should be insignificant for territorial justice. It is not possible to apply rules 3-6 since the nature of the relationship between the breadth and depth of need cannot be determined because none of the studies use indicators of the depth of need. The relationship between the breadth and depth of need may be insignificant, positive or negative. None of these possibilities is any more valid than the others since all three are conceivable. Rule 7 relates to the requirements of territorial justice when quality is

assessed. As none of the previous studies in education have included indicators of the quality of service, rule 7 cannot be applied. On this basis, territorial justice can only be evaluated within the context of previous studies where rules 1 and 2 apply, even though other situations, identified in rules 3, 4 5, 6 and 7 equally represent territorial justice. The implication of this limitation is that less information on territorial justice is available than might otherwise be the case. Rules 3, 4, 5, 6 and 7 can only therefore be applied in future studies which include measures of the breadth and depth dimensions of need, and examine the statistical relationship between them and include indicators of the quality of service provision.

Only those studies which correlate corresponding dimensions of need and provision (rule 1), and those which correlate the breadth of need with the depth of provision or the depth of need with the breadth of provision (rule 2) can be included in a more accurate assessment of territorial justice. Whilst a number of studies examine these relationships, the most common focus is on the breadth of need and total provision. However, evidence on this relationship cannot be evaluated because the correlation between the breadth and depth of need is unknown. Thus all of the evidence in Boaden (1971) and Alt (1971) has to be excluded from this analysis of territorial justice. A number of other correlations within some of the studies are also excluded, for example, the correlations between the breadth of need and total provision in Davies (1968) and Sharpe and Newton (1984) on the basis that the relationship between the breadth and depth of need is unknown.

B. Studies of Territorial Justice in Education: A Reappraisal of the Evidence

Table 2.4 re-presents the evidence on territorial justice in education services. Only

territorial justice on the basis of rules 1 and 2, and the actual relationship found in each of the studies is outlined. Finally, the Table indicates whether or not each of the studies finds evidence of territorial justice.

Table 2.4: Territorial Justice in Education Services

Study	Areas & Time Period	Need: Measure	Need: Dimension	Provision: Measure	Provision: Dimension	Territorial Justice: Required	Territorial Justice: Actual	Territorial Justice
Davies 1968	County Boroughs 1949-1965	1.prop. male pop. in semi/ unskilled occupations	Breadth	expenditure per primary pupil	Depth	1.insignificant	insignificant	Yes
		2. prop. of pop. in poor housing conditions	Breadth			2.insignificant	insignificant	Yes
		3. % age 5-11/11-18 years	Breadth			3.insignificant	insignificant	Yes
		4. % born in New Commonwealth	Breadth			4.insignificant	negative	No
				expenditure per secondary pupil	Depth	1.insignificant	negative	No
						2.insignificant	negative	No
						3.insignificant	negative	No
						4.insignificant	negative	No
Blackstone 1971	Administrative Counties 1965	1.% economically active families	Breadth	maintained provision per 1,000 children aged 2-4 years	Breadth	1.positive	insignificant	No
		2.% of pop. with excl. use of amenities	Breadth			2.positive	insignificant	No
	County Boroughs 1965					1.positive	insignificant	No
						2.positive	insignificant	No
Danziger 1978	County Boroughs 1958-1970	1.pupils per 1,000 pop.	Breadth	expenditure per pupil	Depth	1.insignificant	insignificant	Yes
		2.% male pop. in social class IV and V	Breadth			2.insignificant	insignificant	Yes
		3. % males with a leaving school age of 15/20 years	Breadth			3.insignificant	insignificant	Yes
		4. proportion of immigrants	Breadth			4.insignificant	insignificant	Yes
		5. % of pop. lacking excl. use of amenities	Breadth			5.insignificant	insignificant	Yes
Howick and Hassani 1979	English LEAs 1976	1. prop. of immigrants	Breadth	expenditure per primary pupil	Depth	1.insignificant	positive	No
		2. prop. overcrowded housing	Breadth			2.insignificant	positive	No
		3. prop. unskilled workers	Breadth			3.insignificant	insignificant	Yes
		4.prop. families with 4 or more children	Breadth			4.insignificant	insignificant	Yes
		5. prop. of single parent families	Breadth			5.insignificant	positive	No

Study	Areas & Time Period	Need		Provision		Territorial Justice		Territorial Justice
		Measure	Dimension	Measure	Dimension	Required	Actual	
Howick and Hassani 1980	English LEAs 1976-1977	1.prop. of immigrants	Breadth	expenditure per secondary pupil	Depth	1.insignificant	positive	No
		2. prop. overcrowded housing	Breadth			2.insignificant	positive	No
		3.prop. unskilled workers	Breadth			3.insignificant	insignificant	Yes
		4.prop. of families with 4 or more children	Breadth			4. insignificant	insignificant	Yes
						5.insignificant	positive	No
		5.prop. of single parent families	Breadth			6.insignificant	negative	No
		6. % residents with low income	Breadth					
Pinch 1984	English LEAs 1976	1. % employed married women with children	Breadth	nursery school & class places per	Breadth	1.positive	positive	Yes
						2.positive	positive	Yes
		2. % single parent families	Breadth	1,000 population		3.positive	positive	Yes
		3. % unskilled workers	Breadth					
				reception class places per 1,000 population	Breadth	1.positive	positive	Yes
						2.positive	positive	Yes
						3.positive	positive	Yes
Sharpe and Newton 1984	County Boroughs 1960, 1972	% of pop. of school age	Breadth	expenditure per pupil	Depth	insignificant	negative	No
	County Councils					insignificant	negative	No
Jesson et al 1985	English LEAs 1981	1.% 'poor socio-economic conditions'	Breadth	expenditure per pupil	Depth	1.insignificant	positive	No
		2. % of pop. with heads in social class IV and V	Breadth			2.insignificant	positive	No
				pupil teacher ratio	Depth	1.insignificant	positive	No
						2.insignificant	positive	No

The framework developed by Boyne and Powell (1991) which has been presented above will be used to classify the nature of the correlations found in the studies. As indicated, this framework is used in situations where corresponding dimensions of need and provision are compared. Where the application of rule 2 is appropriate, the actual correlations found in the studies are classified on the basis of insignificant, negative and positive relationships. Territorial justice is only represented where the correlation obtained is insignificant. No other correlation indicates territorial justice. Both positive and negative correlations in these situations represent territorial injustice. A positive correlation represents a situation where the depth of provision increases in response an expansion in the breadth of need. Similarly, a negative correlation implies that the depth of provision decreases when the breadth of need increases.

It is now possible to compare the correlations which were required for territorial justice with those which were obtained in the individual studies (Table 2.4). In the studies presented, it is only positive or insignificant relationships which are required for territorial justice. Taking first those situations where positive correlations were required for territorial justice and weak, moderate or strong results are obtained in a study, it can be concluded that territorial justice exists at the level indicated by the results. The only studies in which positive correlations are required are those by Blackstone (1971) and Pinch (1984). None of these studies produces strong evidence of territorial justice in education. Pinch (1984) finds evidence of moderate and weak territorial justice in the provision of both nursery school and reception class places. Blackstone (1971) does not find any evidence of territorial justice in the provision of nursery education.

In contrast to the limited application of rule 1 on territorial justice, rule 2 is more applicable in the context of the correlations in Table 2.4. All of the Danziger's (1978) correlations presented in Table 2.4 therefore represent territorial justice - an insignificant relationship was required for territorial justice and an insignificant result was obtained. On this criterion, *Davies (1968) himself finds some evidence of territorial justice, although he did not interpret the results in this way.* There is territorial justice between need represented by social class and housing conditions and expenditure per primary pupil. These are not repeated for secondary school expenditure. Territorial justice is also found by Howick and Hassani (1979, 1980) between the proportion of unskilled workers in an area and expenditure per pupil on primary and secondary education. In each of these situations, that is where insignificant relationships were obtained between need and provision, the conclusion which had previously been drawn on the basis of the Davies (1968) criterion was that the correlation was unpatterned and that territorial justice did not exist. An insignificant relationship is in fact what territorial justice requires.

In many of the studies where an insignificant relationship was required for territorial justice, a positive or negative correlation is found. Both positive and negative correlations in these situations represent territorial injustice. In terms of a positive correlation, territorial injustice is therefore found in Davies (1968), Howick and Hassani (1979, 1980) and Jesson et al (1985). On the basis of the Davies criterion (1968), these positive correlations were deemed to represent territorial justice. However, in these situations, territorial justice does not require a positive correlation and the previous conclusion that territorial justice existed is incorrect.

Negative correlations are found in Davies (1968) between a range of circumstances and expenditure per secondary pupil. The correlations tested by Sharpe and Newton

(1984) also find a negative relationship between the school population and expenditure per pupil. These correlations represent territorial injustice. On the basis of the Davies (1968) criterion, these situations were also deemed to represent territorial injustice.

The correlations presented in Table 2.4 provide limited evidence of territorial justice in education services. It is only the Pinch (1984) study which finds evidence of weak or moderate territorial justice where positive correlations were required for territorial justice. In addition, Davies (1968), Danziger (1978) and Howick and Hassani (1979, 1980) find evidence of territorial justice where insignificant relationships between need and provision are required for justice. These relationships had previously been classified as unpatterned. Their inclusion may suggest a stronger correlation between need and provision in education services than had been concluded on the basis of the Davies (1968) criterion of territorial injustice. Here it was concluded that weak-moderate territorial justice existed in the provision of education, with some evidence of an unpatterned relationship. This conclusion has to be re-evaluated on the basis of the rules of territorial justice developed in this Chapter. On the basis of the evidence presented in Table 2.4, less than half of the correlations indicate territorial justice. The majority of these are based on insignificant correlations. It is not possible to determine the strength of justice associated with insignificant correlations. It may be concluded that there is some evidence of territorial justice in education services. Before firm conclusions on the existence of territorial justice in education can be drawn, it is necessary to evaluate the operationalisation of the concepts of need and provision used in the studies presented in Table 2.4.

C. Operationalisation of the Concepts of Need and Provision

In order to make an accurate assessment of territorial justice within a service, it is necessary to use indicators of both need and provision which accurately reflect both of these concepts. In relation to the measurement of need, the most apparent shortfall in many of the studies is the failure to include a specific measure of the actual population of school age. Only Davies (1968), Boaden (1971), Danziger (1978) and Sharpe and Newton (1984) include this measure of the breadth of need. The population of school age is likely to provide a more valid indicator of the breadth of need for education than the population in general. The data within this measure is likely to be easily accessed, since in compulsory education (primary and secondary) this figure is fixed since all children must attend school. In a study of the need for publicly provided education, such a measure would exclude children who attend schools outside the state sector. The failure to include this measure of the breadth of need constitutes one of the key limitations of much of the evidence.

Two of the studies (Boaden 1971, Alt 1971) use the size of the population as a measure of need for education. Clearly, the measurement of need on the basis of the size of the population in an area represents a weak operationalisation of need in education. Two areas, for example, with the same population base, in which one has a large elderly population with few children, and the other a large number of children with few elderly people, can hardly be considered to have the same need for education. In the measurement of need, the indicators adopted should closely reflect the level of need for particular services.

The dimension of need which is completely neglected in the studies is the depth of need. None of the studies include a measure of the depth, or intensity, of the need for education. A measure of the depth of need would be focused on the level of need per

child. In order to obtain such a measure, a range of educational need criteria would be assessed and prioritised in terms of their contribution to the educational needs of the individual child. If, for example, the educational needs of a child living in a lone parent household are deemed to constitute double the level of need than that which is attached to children from other homes, then the depth of need per child from the lone parent household is twice the amount of other children. Other need situations would similarly be weighted. An indicator of the depth of need within an area would therefore be the sum of the weightings attached to individual circumstances calculated on a per pupil basis.

Whilst many of the studies include indicators of the socio-economic status of geographical areas, the depth of need per child is neglected. Consequently, these measures are indicative of the breadth of need - the proportion of the population in particular need circumstances. Pinch (1985:72) recognised the failure in existing studies to focus on this dimension of need. He argues that "although in theory needs play an important part in the conceptual frameworks of Alt (1971) and Boaden (1971), in practice their studies are restricted to comparatively simple measures of population size and social composition". Whilst recognising this issue, Pinch (1984) later uses indicators of need which are all focused on the breadth dimension of need. In terms of the socio-economic variables included in the studies, a range of circumstances are represented without a strong rationale supporting their inclusion. Many of these indicators relate to the characteristics of the population as a whole, rather than to the child population. For example, in many of the studies, indicators of need include 'the number of immigrants per 1,000 of the population' (eg. Howick and Hassani 1979), or the '% of the population in social classes IV and V' (Boaden, 1971) without any analysis of the extent to which children of school age are affected by these circumstances. Whilst Davies (1968:19) recognises the difficulty of using

breadth of need measures such as these which relate to the whole population, he argues that there is likely to be a positive relationship between the existence of these circumstances and the child population "some doubts may be aroused by the procedure of making inferences about the relative needs of an area by measuring the relative incidence on the area of factors associated with or causing individual needs for services. But some users of a social service received by a high proportion of the population - primary school education, for instance - would be almost certain to be affected by any such attribute". Undoubtedly, children may be affected in this way. However, it may also be the case that they are not influenced at all. In this situation, it is not surprising that need and provision are not related. A more accurate operationalisation of the depth of need for education would refer to the depth of need per child. The inclusion of these measures should be supported by evidence that children living in particular types of household are disadvantaged in educational terms. In addition, the extent of the association between need situations, such as children of lone parents, and the depth of need for education should be indicated.

A failure to accurately operationalise educational need can lead to inappropriate conclusions on the existence of territorial justice. The inclusion of indicators of need which do not closely reflect the need for education may go some way towards explaining why limited evidence of territorial justice is provided by previous studies. Another reason, put forward by Lewis (1975:9), is the "considerable amount of unmet need". The author argues that the level of need may be higher than that which is met by service provision. The suggestion that some needs may be unmet has implications for the indicators of need adopted in studies. Indicators of need should provide a reflection of both met and unmet need. Where they do not, this limitation of the data should be recognised. If, for example, need is represented as the 'number of children aged 5-16, there is no unmet need in this situation because education is

compulsory between these years. In contrast, where need is represented as 'the number of children living in families in Social Classes IV and V', the unmet needs which are not included in this assessment of need are those of children in other social classes. Where possible, met and unmet needs should be considered in the evaluation of need.

Almost all of the studies measure service provision on the basis of input indicators. As outlined above, input measures may not provide an accurate indication of the amount of provision those receiving the service actually obtain. This arises because service inputs are subject to variations, such as those relating to efficiency levels, between authorities. Thus with the same inputs, authorities can produce differing levels of service. Within the studies, indicators of the financial resources expended on a service represent the most widely used measure of service inputs. The evidence illustrates that some level of territorial justice exists in relation to expenditure within education services (Davies 1968, Danziger 1978, Howick and Hassani 1979, 1980). It should be recognised, however, that this does not mean that territorial justice exists within the actual service produced with this expenditure since similar resources may deliver different levels of service across local authorities.

Measures of service outputs more closely reflect the service provided to clients and therefore represent the most appropriate indicators of provision for assessing territorial justice. However, across all of the studies, it is only Blackstone (1971) and Pinch (1984) who include a measure of service outputs. In both of these studies, outputs is represented by nursery school and class places per 1,000 children aged 2-4 years (Blackstone 1971) and per 1,000 population (Pinch 1984). Blackstone's (1971) measure of outputs is calculated on the basis of a more appropriate population base than Pinch's (1984) since the indicator focuses on nursery age children, rather

than the population in general. Blackstone (1971) does not find evidence of territorial justice. In contrast, Pinch's (1984) study provides evidence of territorial justice in the provision of nursery school and reception class places.

In terms of the measurement of education service provision, all of the studies adopt measures of the quantity of provision rather than its quality. Whilst quality of service is not easily assessed, the failure of the studies of territorial justice in education studies to focus on the quality of service provision must be recognised. As a consequence, the relationship between need and quality is unknown in education.

It is possible to pick out some of the relationships between the measures used and the results obtained in the studies. A number of studies which have correlated the proportion of unskilled workers or % male population in Social Classes IV and V with expenditure per pupil have found evidence of territorial justice (Davies, 1968, Danziger 1978, Howick and Hassani 1979,1980, Pinch 1984). The insignificant correlations found in these studies are indicative of territorial justice. The application of the Davies (1968) criterion on territorial justice in each of these situations led to the conclusion that the correlation between need and provision was unpatterned. Jesson et al (1984) is the only study which includes both of these indicators of need and provision which does not find an insignificant correlation. The studies which have correlated large families with expenditure per pupil (Howick and Hassani 1979,1980) also find evidence of territorial justice. With the exception of Danziger (1978), none of the studies which have included indicators of the ethnic population find territorial justice (Davies 1968, Howick and Hassani 1979,1980, Jesson et al 1985). Similarly, single parent families as a measure of need produces little support for territorial justice. It is only Pinch (1984) who finds evidence of territorial justice between this indicator and nursery education provision. The evidence is also limited between

indicators of poor housing conditions, such as overcrowding or households lacking amenities. In general, studies which have correlated unskilled workers and large families with measures of the depth of education provision, (such as expenditure per pupil) have found evidence of territorial justice in education provision. In broad terms, the correlation of single parent families, ethnic population and poor housing conditions with provision produces evidence of territorial injustice.

Blackstone (1971) is the only study solely concerned with nursery education and merits further examination on this basis. Blackstone (1971) examines the relationship between a range of socio-economic need variables and provision, represented by the total, maintained and independent nursery places per 1,000 child population aged 2-4 years. Of these, it is only the correlations relating to maintained (state provided) nursery education which is relevant in terms of local authority provision. Blackstone (1971) conducts separate analyses for the Administrative Counties and the County Boroughs in 1965. There are two key limitations of the study. Firstly, need and provision variables are correlated with each other without any discussion of the likely influence of the measures of need on education provision. The measures of need are not clearly focused on the needs of nursery age children. Instead, the measures focus on, for example, the economic activity of adults. Indicators of need such as this are unlikely to be highly correlated with the provision of nursery education since nursery education does not normally meet the needs of working parents. This is because nursery education is not usually provided on a working day basis. Secondly, the study is limited in the fact that it only concerns one year. These limitations may have affected the ability of the study to find evidence of territorial justice in nursery education.

The accurate operationalisation of the concepts of need and provision is central to the development of reliable conclusions on territorial justice. As the discussion above has highlighted, the measurement of need in education is not focused clearly enough on the needs of children as distinct from the needs of the population more generally. Generally, indicators of need are included without a strong supporting rationale of their influence on educational need. The issue of unmet needs should also be addressed in the selection of indicators of need. In terms of provision, the indicators adopted in previous studies rely heavily on the use of measures of the input aspect of education services. The implication of the weak operationalisation of the concepts of need and provision is that the evidence on territorial justice provided by the studies is not reliable. A more appropriate assessment of territorial justice which accurately operationalises the concepts of need and provision must be made in order to determine the extent of justice in the provision of education services.

D. Time Lags

The final issue to be raised in relation to the studies is that of time period - specifically the extent to which a time lag exists between the measures of need and provision. The identification of an appropriate time frame is not a simple process. It is a remote possibility that the provision of a service in one year can be affected by the actual level of need in a future year. It is more likely that provision is influenced by need in the same or an earlier year. The selection of the appropriate time period to make comparisons between need and provision should be based on a rationale indicating the appropriate time lag between need and provision. However, no such rationale exists, and even if it did, it is unlikely that the same rationale would be appropriate for every local authority service. The relationship between the occurrence of need and the provision of a service may be specific to each service. In education, needs are normally identified in January of each year when schools are required to

submit returns to local authorities on the number of children. The financial year in local government and in education is from the beginning of April in one year until the end of March in the next. It is likely that decisions made at the start of April on education provision are in response to needs which have been identified in the previous January. The appropriate time frame in education is therefore one in which need and provision variables relating to the same year can be correlated.

Of the studies, Davies (1968) is one of the few which correlates need and provision variables relating to the same year. In contrast, Pinch (1984) correlates provision data relating to 1976 with need data for 1971. A five year time-lag between need and provision is assumed by the author with no justification for this approach. Similarly, Blackstone (1971) correlates provision data for 1965 with need data relating to 1961 without any supporting rationale. These authors are not alone in the adoption of such practices. Many others, for example, Howick and Hassani (1979, 1980) do likewise. It would appear that the availability of census data on the incidence of need may have influenced these time lags. The failure of the studies to develop a rationale for a particular approach suggests an unjustifiable lack of attention to this issue. The nature of the time period in which need and provision variables are compared must be considered in order to develop reliable conclusions on the relationship between these variables.

E. Summary

In conclusion, the nature of the relationship between educational need and provision can only be described as weak. In general terms, there is some evidence to indicate that patterns of education expenditure are related to the level of need, represented by pupil numbers and socio-economic circumstances. However, evidence of territorial injustice also emerges. The studies might have found stronger evidence on territorial

justice had the relationship between the breadth and depth dimensions of need or provision been known. On the basis of the evidence available, weak territorial justice exists in the provision of education services. In addition, the evidence also shows territorial injustice between measures of the breadth of need and depth of provision.

There are three key limitations of the evidence. The first of these relates to the dimensions of need and provision which are correlated in the studies. Existing studies fail to recognise the dimensions of need and provision in assessing territorial justice. As a consequence, the Davies criterion for territorial justice is automatically employed without any consideration of its appropriateness in every situation. In terms of the rules for the assessment of territorial justice developed in this Chapter, it is only rules 1 and 2 which could be used in the context of previous studies even though other situations equally represent territorial justice (rules 3, 4, 5, 6 and 7). For this reason, a number of studies of need and provision had to be excluded from this analysis of territorial justice.

The second limitation concerns the measurement of need and provision in the studies. In relation to need, the majority of measures adopted in the studies do not focus clearly enough on the need for education. Measures of the child population should refer to the number of children in a particular age category (primary or secondary). The use of socio-economic indicators in all of the studies also refers to the existence of these circumstances in the population generally. Thus the assumption that the ethnic make-up of an area, for example, has a direct impact on school age children is made. A measure which reflects children living in these circumstances is more appropriately focused on educational need (assuming that ethnic origin gives rise to educational need). In relation to service provision, the emphasis of previous studies is on service inputs. As highlighted above, inputs may not accurately reflect the service

which is provided since varying levels of service can be produced with a given level of input. Service outputs must be incorporated into the evaluation of territorial justice since outputs, representing service levels, are more directly comparable between areas. An improvement in the measures of need and provision employed would provide a more appropriate assessment of the extent of territorial justice in education services.

The third limitation of the studies concerns the time-lag between need and provision variables. Existing studies do not justify the adoption of particular lags between need and provision. Time lags which can not be justified on grounds other than data availability may have affected the capacity of the studies to provide evidence of territorial justice.

More recent evidence of territorial justice, particularly evidence relating to the 1980s and 1990s, is long overdue. Much of the evidence relates to the local government system prior to the 1974 re-organisation of local government in England and Wales. The previous studies do not provide an indication of the extent to which education provision has responded to changes in the level of need in the 1980s and 1990s.

Whilst some studies are concerned with territorial justice in nursery education, the central focus of previous studies is clearly on the compulsory sectors of education (primary and secondary). More evidence of the influence of need in nursery education is necessary.

Conclusion

This Chapter has examined territorial justice at both the conceptual and statistical levels. It has re-assessed the Davies (1968) criterion for territorial justice on the

basis of the arguments relating to the dimensions of need and provision advanced by Boyne and Powell (1991). A set of rules for assessing territorial justice has been developed which are substantially different from the Davies (1968) criterion of territorial justice. These rules were applied to previous studies of territorial justice in education services and evidence of weak territorial justice overall was found. On the basis of the Davies (1968) criterion, weak-moderate territorial justice existed in education services. The use of the rules, rather than Davies (1968) criterion of territorial justice, changes the conclusion on the extent of territorial justice in education services. The limitations of the previous studies have been identified, particularly in relation to the operationalisation of the concepts of need and provision and the issue of time-lags between need and provision variables. A more accurate operationalisation of the concepts, together with a more complete discussion of the time-lag between the variables, would provide more reliable evidence on territorial justice in education services. This study now moves on to examine the provision of nursery education.

Chapter 3: The Provision of Nursery Education

Introduction

This Chapter examines the provision of local authority nursery education in England and Wales. Part one examines different types of nursery education provision. Services which offer education are separated from those services which predominantly aim to provide a care facility for children. In part two of the Chapter, the conceptual issues surrounding the measurement of service provision are considered. Following this, several indicators of service provision are identified. Finally, part three of the Chapter highlights the geographical variations in the quantity and quality of nursery education provision between local authority areas in England and Wales.

I. Current Range of Nursery Education Provision

There is currently a wide range of public and private sector provision for the under fives in England and Wales which deliver a complex and diverse pattern of services. Table 3.1 shows the number of places within pre-school provision in 1981 and 1991. A higher number of children are likely to attend some form of preschool service than the figures in Table 3.1 suggest since some nursery places may be used by two children on a part-time basis. Pre-school services are provided by the state through local education authorities, social service and leisure departments. Education departments are responsible for providing nursery schools and classes and infant reception classes in primary schools. Social service departments provide services such as day nurseries and family centres. Local authority leisure departments offer services such as creches, 'drop-in' centres and 'One O'Clock' clubs. The private sector also provides facilities for the under fives in the form of playgroups, childminders and private day nurseries.

Table 3.1: Range of Nursery Education Provision: 1981, 1991

	Number of Full-Time Equivalent Places* (England)		
	1981	1991	%change 1981-1991
Nursery Schools and Nursery Classes	130,997	177,873	+36
Infant Classes	205,673	272,178	+32
Independent Nursery Schools	22,017	27,039	+23
Playgroups	367,868	428,420	+16
Combined Nursery Centres **			
Day Nurseries	28,437	27,039	-5
Childminders	98,495	233,258	+137

*full-time equivalent places calculated on the basis that two part time pupils occupy one full-time place
** national figures not available

source: adapted from Sylva K. and P. Moss (1992) Learning Before School NCE Briefing Paper No.8.

Nursery schools are run by local education authorities in self-contained nursery premises and not part of a primary school attended by older children. Nursery schools provide an educational service to develop children's cognitive and social skills. They are staffed by teachers with nursery/primary teaching qualifications and are open for five days a week during the academic year. Nursery classes are the "same as local education authority nursery schools in all respects except that classes are part of a primary school attended by children aged five and over" (Osborn and Milbank 1987). Nursery classes, although part of the larger primary school, exist to provide an educational facility for children under five. Staff usually consist of a qualified teacher

and a nursery assistant. In 1991, provision within nursery schools and classes represented 14% of all provision for the under fives (Sylva and Moss 1992:2).

A third form of pre-school provision is the infant reception class within an infant or primary school. Infant classes can be regarded as an additional form of nursery education since many under fives are accommodated in such classes (Osborn and Milbank 1987). In 1991, infant classes provided 22% of all places for the under fives, with the places available increasing by 32% from 1981-1991 (Sylva and Moss 1992:2). Children who attend infant classes are admitted to primary school earlier in the year in which they become 5. Ghaye and Pascal (1988) argue that increased demand for pre-school provision for four year olds in the U.K. has been met largely by early admission to infant classes rather than through the development of additional nursery school or class places.

A fourth form of nursery education is independent nursery schools. These schools are privately run on a fee-paying basis and are staffed by trained teachers. Schools are required to register with the Department of Education and Employment and must meet the same educational standards as local authority nursery schools. All other private sector establishments register with the Department of Social Services as private day nurseries. On the basis of the data presented in Table 3.1, places within this form of provision increased by 23% between 1981-1991.

Pre-school provision is also delivered through playgroups which were established by parents during the 1960's in response to the failure of the state to provide sufficient state nursery school places (Finch 1984). In fact, playgroups evolved due to anger from parents in response to the Ministry of Education Circular 8/60 which restricted the development of nursery education (Lucas and McKennell 1974). Playgroups are

largely staffed by interested parents and are required to register with local authority social service departments. Playgroups provide a place for many young children, and, as Table 3.1 shows, playgroups represent the largest form of pre-school provision. There is little agreement amongst academics and practitioners on the whether playgroups represent an education or a care facility. One report argues the "playgroups aim to meet the play and social needs of children by bringing them together in small groups for supervised play and other activities" (ACC/AMA 1977). A central objective of the Pre-School Playgroups Association, however, is the recognition of children's educational needs. Although many playgroups may provide an educational function, the evidence indicates that playgroups are not essentially concerned with the provision of educational services for children under-five (Webb 1974, Bruner 1980, Pinch 1984, Osborn and Milbank 1987).

Combined nursery centres are jointly run by local educational authorities and social service departments. They exist to provide a range of care and educational facilities for children from a few months old to 5 years old. According to the Rumbold Committee, (DES 1990), combined centres are staffed by teachers and nursery nurses, although some also employ health visitors and social workers. There are no figures available on the national profile of places available, nor the quality of the service provided in combined centres.

Local authority day nurseries exist to provide a care and not an educational facility for children under five (Parry and Archer 1974). Attendance at a day nursery is usually the result of a recommendation made by a social worker that it would be in the interests of the family for the child to attend (ACC/AMA 1977). Day nurseries provided by the private sector are required to register with Social Service

Departments and, like state day nurseries, are staffed largely by nurses and provide extended all-day care for children throughout the year.

Another form of pre-school care is that provided by childminders. Childminders largely perform duties associated with the physical needs of children. A large proportion of all pre-school provision is delivered by childminders. Childminding, frequently described as the traditional form of child care for employed mothers (Osborn and Milbank 1987), does not serve to provide an educational function and is therefore excluded from the definition of educational provision in this Chapter.

Of the range of pre-school services identified above, those services which can be classified as 'education' are nursery schools, nursery classes, infant reception classes (all LEA) and independent nursery schools. These facilities collectively provide nursery education for children aged three to five years. Since the focus of this study is on the provision of public sector nursery education, independent nursery school provision is excluded from the analysis.

Over the past decade, a trend to admit children to infant classes in primary schools prior to the statutory age (at start of the term following their fifth birthday) has been developing in England and Wales. Dowling (1995:xii) argues that there are two main reasons for the move to early admission. The first is the falling school rolls in the primary sector during the 1970s. Whilst numbers of primary school children increased during the 1980s, Dowling argues that "the upturn was not evenly spread demographically: some inner-city and rural schools still have to seek ways of boosting their numbers and will do so by admitting younger pupils". The second reason is associated with the educational reforms introduced in 1988. The introduction of formula funding and open enrolment in the reforms have placed

pressure on schools to maintain pupil numbers. In admitting children under five to primary schools, local authorities have adopted a single point of year entry. This is often set at the start of the school year following a child's fourth birthday. Local authorities policies on the age of admission to education vary. Using the example cited by Woodhead (1989), an authority with a policy of annual entry, set at the point after a child's fourth birthday, a child born on 31 August 1985 would enter primary school in September 1989. In contrast, in an area where the statutory requirement is followed, the child would not enter school until September 1990. In this area, a September 1990 entry would also apply to children born after Easter 1985. Thus there may be a difference of up to 16 months in the admission of children into the school system across different authorities. Whilst the tendency for LEAs to adopt an annual point of entry, set in the academic year after a child's fourth birthday, does not constitute a statutory change in admission, the shift has had the effect of increasing the number of children under five in education. Authorities which admit children to school prior to the statutory age of entry are those which are likely to have the greatest number of places for the under fives. However, these places are provided within primary schools which may not meet the specific needs of the under-fives (see below). Cleve et al (1985) have researched local authority admission policies. The findings of this research indicate that admissions policies vary between the Non-Metropolitan Counties, the Metropolitan Districts and the London Boroughs. In contrast to the Counties, the majority of Metropolitan Districts and London Boroughs favour the admission of children below the statutory age.

Questions have been raised about the comparability of the service delivered in nursery schools/classes and infant classes in primary schools (Ghaye and Pascal 1988; Stevenson 1988; DES 1989). The DES (1989:5), for example, argue that:

"the quality of education for children under five is greatly influenced by the type of provision within which it takes place. Taking all factors into account, children under five in nursery schools receive a broader, better balanced education than those in primary (infant) classes".

Pascall (1990) argues the nature of the service within nursery schools and classes is more focused on the educational needs of nursery school children than infant classes in primary schools. The Rumbold Report (DES 1990:27) argues that to provide adequately for children within infant classes:

"such classes should enjoy a more generous ratio of staff, who have received early years training, and should offer an appropriate range of activities and a curriculum which is capable of being adapted to meet the needs of all children in the class".

Similar arguments have been advanced by OFSTED (1993b:15) in their inspection of nursery education provision:

"the achievement of under-fives in reception classes was much less consistent (than nursery schools and classes) with poor and unsatisfactory standards in some classes. Where poorer standards obtained, this was due in large measure to a poorly planned curriculum which failed to consider adequately the particular needs of the under-fives. The pupil-adult ratio was markedly less good in reception classes than in nursery classes".

On the basis of such arguments, nursery education which is provided in nursery settings (nursery schools and classes) can be separated from that which is provided in primary schools (infant classes).

This section has examined the current range of nursery education provision in England and Wales. Services which are primarily focused on the promotion of educational skills are nursery schools and classes and infant classes within primary schools. The nature of service provided in infant classes is less oriented around the nursery educational needs of the under fives than nursery school and class services.

II. Measuring Nursery Education Provision

A. Conceptual Issues

This section of the Chapter focuses on the conceptual issues surrounding the measurement of nursery education provision.

In the measurement of nursery education provision, three broad issues must be considered: the aspects of provision, the dimensions of service provision and the quality of service provision. As discussed in the previous Chapter, there are three aspects within the concept of service provision - inputs, outputs and outcomes. Service inputs refer to the level of resources committed by public organisations to a particular service eg. expenditure or staffing within nursery education. Service outputs involve the actual service provided by organisations such as the number nursery school places. Service impact concerns the effect or outcome of service provision on the volume of service need which the policies were designed to alleviate (eg. the effect of nursery school attendance on pupils under five). Service outputs represent the most appropriate aspect of provision in the assessment of territorial justice (see p. 46 above).

There are three dimensions within service provision: breadth, depth and total. Breadth of provision refers to the proportion of the population receiving a service (eg. the % of children with a nursery place). The depth of provision concerns the amount of service received by individuals (eg. expenditure per nursery pupil). Total provision embodies the breadth and depth dimensions of provision. The indicator 'nursery expenditure per capita' provides a measure of total provision. In order to make a complete assessment of service provision, it is necessary to evaluate each of these dimensions of service provision.

Whilst service outputs represent the most appropriate aspect of provision in the assessment of territorial justice, indicators of inputs are required in order to assess the depth and total dimensions of service provision. This is because resources are the only unit which is available to calculate the amount of service provision received by each pupil (see p. 54 above).

The third issue is that of the quality of service provision. Quality refers to the standard of service received by the client population. In the measurement of quality, two issues have to be resolved. Firstly, the meaning of quality within nursery education has to be identified. Secondly, quality has to be measured. In the context of quality in health care, Powell (1990a:35) argues that "it is difficult to define, and even more difficult to measure, the quality of medical care". Powell uses a classification of quality identified by the Royal College of General Practitioners (RCGP) to define and measure quality in health care. According to this framework, quality may be considered in three ways: structure, process and outcome. Structure relates to features of the setting within which health care is delivered, for example, the buildings or the qualifications of the providers of care. Quality of process refers to the service which is delivered. Finally, outcome is concerned with the impact of the service. The RCGP (1985:2) argue that "the quality of an individual doctor's performance is best assessed by examining both process, that is what he does, and outcome, that is how this affects his patients; to omit outcome is to neglect the goal of medical care, while to omit process is to neglect the essence of that care". Therefore process and outcome indicators provide the most appropriate assessment of quality of service within a service.

In the applying this framework of quality to nursery education, inevitably the identification of quality "will start from and involve value judgements" about what is desirable (Melhuish 1990:20). The structural aspects of quality in nursery education may be associated with the setting within which the service is delivered. Nursery school and class provision has been deemed to provide a higher quality of nursery education than that delivered in infant classes (see p. 100 above). In addition, quality may be associated with teaching staff, as opposed to nursery assistants, in nursery education. Quality of process may be assessed on the basis of the curriculum for the under fives. The DES (1989) argue that a curriculum which encourages the early development of knowledge and uses a range of materials and equipment in order to extend learning experiences may be identified as a quality service. The quality of outcome in nursery education measures the impact of the consumption of the service on children.

In terms of the extent to which three aspects of quality are appropriate in the assessment of territorial justice, the structural aspect of quality may be considered relevant if certain assumptions are made. For example, if quality is assessed in terms of modern nursery buildings or qualified teachers, the assumption which is implicit in these indicators is that quality is represented by the presence of these characteristics. However, modern buildings or qualified teachers, for example, cannot guarantee that the nursery education which is delivered in the classroom is a quality service. The issue of the extent to which qualified teachers provide an indicator of quality is examined below (see p. 110 below). Process indicators of quality focus much more clearly on the service which is delivered. An assessment of the quality of the process is therefore central to the assessment of territorial justice. Is quality of outcome relevant to territorial justice? Walsh (1991:513) argues that quality of outcome is affected by the relationship between the provider of a service (producer) and the

consumer. He argues that "producers need to trust consumers in the case of services because customers are part of the production process. The doctor or teacher is unlikely to succeed without the cooperation of the client, and the professional will need to be confident that the client will behave responsibly". The outcome of a service is therefore influenced by the response of the client to the service. As such, quality of outcome indicators may not be considered appropriate in the evaluation of territorial justice. Quality of process indicators provide the most appropriate aspect of quality in the measurement of territorial justice.

A further issue in relation to the identification of quality in nursery education is that service users and service providers may have very different ideas of what represents a quality service. Whilst it may be more appropriate to define quality in terms of the consumer, where the spatial scale is wide, as in this study, this may not be possible. As Walsh (1991:505) argues: "the user is necessarily involved in the evaluation of quality, and the impossibility of inter-personal comparisons of utility means that the measurement of quality is always a matter of judgement". Quality may therefore be identified on a more 'objective' basis involving research findings about what is desirable in nursery education settings. Quality may be assessed on the basis of the content of the curriculum for the under fives, the setting within which nursery education is delivered, or the staffing of establishments.

In conclusion to this section, indicators of service outputs will be adopted in this study as these are the most appropriate aspect of provision in the assessment of territorial justice. The dimensions of breadth, depth and total provision will be considered in the selection of output indicators. Indicators of service inputs will also be used in order to incorporate the dimensions of depth and total provision into this study. Appropriate indicators of quality of the nursery education process will also be

adopted. This is a much more comprehensive assessment of service provision than has been conducted in any previous study of territorial justice in education, or any other local authority service.

B. Indicators of Nursery Education Provision

This section of the Chapter develops indicators by which nursery education provision can be assessed. Service outputs concern the service provided by local education authorities. As identified in Part I above, state provided nursery education services are provided in nursery schools, nursery classes and infant reception classes within primary schools. In order to operationalise the concept of nursery education provision, a number of features of the service delivered can be identified. These relate to: the number of places available; staffing levels; and the amount of resources spent on nursery education services. Of these features, only the places available reflects the output aspect of service provision. Both staffing and financial resources represent indicators of service inputs. Measures of service output include the nursery places supplied by education authorities. It would also be appropriate to include the activities which occur within nursery services, for example, the extent to which children are involved in reading activities, or learning through play. A measure of these outputs would be the 'quantity of reading tuition', for example. Data sources, however, do not provide information in these areas.

Indicators of service inputs are also adopted in this study. The limitations of input measures, which have been identified in the previous Chapter, must be recognised in the interpretation of data relating to provision. These limitations are that service inputs - the resources expended on a service - may not be related to the level of service which is produced because both the costs of production and efficiency levels are subject to variation. Thus, for example, the same per pupil nursery school

expenditure in two areas can produce very different services, or outputs. Whilst the limitations of input measures are recognised, since both the depth and total dimensions of service provision have to be expressed in resource terms, indicators of staffing levels and the financial resources expended on nursery services are incorporated into this assessment of service provision.

The measures of provision adopted in this study encompass the three dimensions of breadth, depth and total (see Table 3.2). The measures of the breadth of provision are: full-time and part-time places per 1,000 3 and 4 year olds (FPC and PPC); total places per 1,000 3 and 4 year olds (PC); nursery school and class places per 1,000 3 and 4 year olds (NSACL) and infant class places per 1,000 3 and 4 year olds (INF).

Table 3.2: Measures of Provision in Nursery Education

Indicator	Label	Dimension	Aspect	Source
Full-time places per 1000 3 & 4 year olds 1981-1994	FPC	Breadth	Output	1&2
Part-time places per 1000 3 & 4 year olds 1981-1994	PPC	Breadth	Output	1&2
Total places per 1000 3 & 4 year olds 1981-1994	PC	Breadth	Output	1&2
Nursery school and class places per 1000 3 & 4 year olds 1981-1994	NSACL	Breadth	Output	1&2
Infant class places per 1000 3 & 4 year olds 1981-1994	INF	Breadth	Output	1&2
Net expenditure in nursery schools per pupil 1981-1987	NEXPP	Depth	Input	3
Teachers per 1,000 pupils in nursery schools and classes 1981-1994	TEACH	Depth	Input	1
Total staff per 1,000 pupils in nursery schools and classes 1981-1994 (includes non-teaching staff)	STAFF	Depth	Input	1
Net expenditure in nursery schools per 3 & 4 year old 1981-1987	NEXTC	Total	Input	3
% of all places provided in nursery schools and classes 1981-1994	QUALP	Quality	Output	1&2

Sources:
1. Department of Education and Science. 1981-1994 *Pupils Under Five Years of Age in Schools in England* (Department for Education and Science: Government Statistical Service)
2. Welsh Office. 1989-1994. *Statistics of Education and Training in Wales: Schools* (Welsh Office: HMSO)
3. CIPFA. 1981-1987. *Education Actuals 1981-1987* (London: Public Finance Foundation)

Depth of provision is represented by the following measures: net expenditure per nursery school pupil (NEXPP); teachers per 1,000 pupils in nursery schools and classes (TEACH); and total staff per 1,000 pupils in nursery schools and classes (STAFF). Each of these indicators focuses on the amount of service per pupil. NEXPP refers to nursery schools only since this is the only service for which data is available. There are two measures of staffing - STAFF seeks to reflect total staffing

including both teaching and non-teaching staff within nursery schools and classes. TEACH measures the teaching staff alone. Data on the staffing of nursery services is only available for nursery schools and classes and not infant classes in primary schools.

Total provision is measured by expenditure in nursery schools per 3 and 4 year old (NEXTC). Data is not available for other types of nursery establishment. NEXTC provides a measure of the total dimension of service provision - expenditure on nursery schools per 3 and 4 year old child, many of whom will not be nursery school pupils. Within NEXTC, breadth of provision is represented by the number of pupils with a nursery school place and depth of provision by the amount which is spent per pupil. These were multiplied and the score divided by the number of 3 and 4 year olds to obtain the measure NEXTC. Total provision is measured per 3 and 4 year old in preference to per capita as children, rather than the population in general, are the relevant client group in nursery education.

The one indicator of quality of provision in Table 3.2 is the '% of places in nursery schools and classes' (QUALP). Since nursery school and class provision represent the most appropriate types of nursery education, the proportion of all places which is provided in nursery schools and classes represents an indicator of the quality of provision. Thus authorities which offer the highest proportion of nursery school and class places provide the highest quality of nursery service. On the basis of the quality framework discussed in above, this indicator may be classified as a measure of both the structure and the process aspects of quality (Royal College General Practitioners 1985). The proportion of all places provided in nursery schools and classes provides a measure of structure as it is concerned with nursery setting and the context of

service provision. Since the measure is also provides a reflection of activities within nursery education, it may also be deemed a process indicator.

The measurement of quality in nursery education is limited in that only the nursery setting is considered. It would also have been appropriate to include additional process indicators of quality such as the nature of the curriculum, for example, in this assessment of nursery provision. However, data in areas such as this are not available.

The measurement of quality of service is one of the most neglected fields in studies of territorial justice in education services generally and in other service areas across local authorities. Only Powell (1987, 1990b) has considered quality of service in studies of health provision. At the intra-area level, Pattie (1986:1252) has included quality in his study of the provision of primary education in Sheffield. Pattie includes pupil:teacher ratio as an indicator of the quality of education services. The author argues that "pupil:teacher ratios were employed in the subsequent analysis as they provide a measure not simply of the quantity of provision, but also its quality". No supporting rationale is provided by the author for this view. Another author, Ermisch (1983:233) also suggests that "although it should not be taken as a precise indicator of the educational standard, the pupil:teacher ratio is an easily understood measure which generally provides a fair guide to the standard of provision". Pupil:teacher ratios represent an indicator of the quantity of education provision and more specifically a measure of the input aspect of service. As such, they have been inappropriately judged by both Ermisch (1983) and Pattie (1986) as a measure of quality of service.

The majority of the measures of nursery education provision (Table 3.2) represent indicators of the input and output aspects of service provision. Outputs represent the most appropriate aspect of service provision in the assessment of territorial justice. Nursery places represent indicators of the output aspect of service. Measures of the input aspect of provision are used in this study because the depth and total dimensions of provision can only be measured in the financial unit of resource. The measures of inputs are per pupil expenditure in nursery school (NEXPP) and expenditure per 3 and 4 year old (NEXTC). Indicators of staffing (TEACH and STAFF) also represent indicators of the inputs aspect of nursery education. Quality is assessed on the basis of the setting in which nursery education is delivered. This indicator is both a structure and a process measure of the quality of nursery services.

A key issue which has to be addressed is the extent to which it is appropriate to make an assessment of territorial justice on the basis of components of a service. In this study, full-time and part-time places are examined separately, as are the provision of nursery school and nursery class, and infant class places. Each of these components make up the breadth of nursery places provided (PC). Thus total places per 1,000 3 and 4 year olds (PC) represents the sum of full-time places per 1,000 3 and 4 year olds (FPC) and part-time places per 1,000 3 and 4 year olds (PPC). Total places per 1,000 children (PC) is also the sum of nursery school and class places per 1,000 3 and 4 year olds (NSACL) and infant class places per 1,000 3 and 4 year olds (INF). Davies (1968:21) argues that in order "to gain a balanced picture of provision in an area, it is essential to understand the degree to which services meet basically similar needs and can be substituted for each other". Although nursery schools and classes and infant classes in primary schools provide different services, the broad focus of the three services is an educational one (DES 1989). An examination of the components of nursery services allows comparisons to be drawn

between the type of service provided by LEAs. It may therefore be considered inappropriate to make territorial justice assessments of components of a service as LEAs each have the power to determine the distribution of places between the three services. An authority may, for example, decide to provide all of its places in nursery schools and classes. In this instance, the provision of infant class places would be territorially unjust, whilst the provision of nursery school and class places may indicate territorial justice. Davies (1968:22) argues that in situations such as this "a great deal of inequality in standards of provision of individual services would sometimes be necessary to compensate for excessive equality of standards in related services". It is therefore necessary to examine the total provision of nursery education and the service provided within the three types separately in order to make an appropriate assessment of territorial justice. Territorial justice assessments of each type of service is also justified if it is the case that one type of service is deemed to offer a less appropriate nursery education place than other types of service. Infant class places provide the least appropriate form of nursery education (Sylva and Moss 1992). Whilst infant classes may not be considered 'ideal', it has to be recognised that infant classes represent the major form of nursery education in many LEAs and therefore must be included in nursery education provision. In relation to full-time and part-time places, there is an absence of a clear consensus in the literature on whether a full-time or a part-time place is more appropriate for nursery children. In so far as there is agreement, part-time places are generally deemed to be as suitable for children as full-time places. An examination of part-time and full-time places separately is appropriate since it allows an assessment of the quantity of service to be made. Thus, whilst there may be no distinction between part-time places and full-time places in terms of their suitability for children, a full-time place provides a higher quantity of service than a part-time place.

This section of the Chapter has examined the indicators of provision adopted in this study of territorial justice in nursery education. Indicators of the breadth, depth and total provision have been included. These measures focus on the output aspect of the service (nursery places), together with measures of service inputs (expenditure and staffing). An indication of the quality of nursery education, represented by the proportion of all places which is provided in nursery schools and classes, is also included in this study. Finally, it was deemed appropriate to make an assessment of territorial justice on the basis of the individual services within nursery education.

C. Data on the Provision of Nursery Education

This examination of the provision of nursery education is concerned with the period 1981-1994. In 1981, two publications included nursery education data. The first of these, Education Actuals provides figures on nursery schools eg. number of places and expenditure per pupil. In 1988, this data was combined with primary education. The second source of data, the Statistical Bulletin on Under Five Education provides a range of nursery education data, particularly on the provision of places and staffing of all three types of nursery provision in England (nursery schools and classes and infant classes in primary schools). However, this source does not include data on expenditure.

Data on the provision of places in England has been gained from the annual Statistical Bulletin on Under Five education. The data relate to each year between 1981-1994. Similar data for Wales has been obtained in the Statistics of Education and Training in Wales. However, this data only refers to the years 1989-1994. It has not been possible to include data on the provision of places in Wales before this period because the data is not comparable to the data for England. This is because before 1989 the data did not adopt the same terms (nursery school, nursery class and infant class) as

the data in England and consequently, the under fives in primary schools category in Wales includes nursery classes in primary schools. Within the same publication, figures on 3 and 4 year olds in infant classes within primary schools are presented. These figures are not the same as the under fives in primary schools. Overall, the Welsh data prior to 1989 is incomplete and lacks comparability with English sources. Welsh data on the provision of nursery places became directly comparable with English sources in 1989, when data relating to the number of 3 and 4 year olds also became available. Expenditure figures only refer to 1981-1987 in England and Wales and to nursery schools only, since this is the only service for which data are available. This has restricted the capacity of this study to examine the variations between authorities in the provision of nursery class and infant class expenditure levels. Data on staffing relate to each year between 1981-1994 and are only available for England. In Wales, figures on teaching and non-teaching staff are only available for nursery schools and not other types of establishment. This therefore precludes their comparability with English sources.

Prior to an examination of provision levels, it is necessary to identify the limitations of national published statistics. The most comprehensive data has been obtained from the annual Statistical Bulletins on education provision for the under fives published by the Department for Education and Science. The drawback with the use of this source is that the data relates to local authorities in England. Although the Welsh Office publishes separate figures for Wales, it has not been possible to use the Welsh data alongside the English data throughout the period since the data are not comparable in the period 1981-1988. An additional source of data is provided by CIPFA in the annual Education Actuals. The publication of separate nursery provision data was, however, discontinued in 1987 when nursery education data was incorporated into primary school figures. Despite these limitations, it is still valid to examine inter-

authority patterns in the provision of nursery education since the data collected contains key information on the provision of nursery places, expenditure and staffing in nursery education over a fourteen year period. Across this period, between 1981 and 1988 the data relates to LEAs in England, in 1989 Wales was added to the figures and in 1991 data relating to the Inner London Boroughs became available for each authority with the abolition of the Inner London Education Authority. Altogether, a total of 115 authorities have been included in this analysis of the provision of nursery education [6].

III. The Provision of Nursery Education in England and Wales 1981-1994

A. Inter-Authority Variations

This section of the Chapter moves on to examine inter-authority variations in service provision in England and Wales between 1981 and 1994. For each of the indicators of provision, Tables 3.3 - 3.12 present the mean, coefficient of variation, the minimum and maximum authorities and the number of authorities. The figures for all authorities in England and Wales are examined together as the aim is to provide a comprehensive assessment of territorial justice across all LEAs in England and Wales.

Tables 3.3 - 3.7 focus on the breadth of provision. Table 3.3 presents the figures relating to the provision of full-time places per 1,000 children. Authorities provided an average of between 248 and 286 full-time places per 1,000 children between 1981 and 1994. Over the period, more places are provided on a full-time basis. The coefficient of variation shows that the level of variation between authorities in terms of the provision of full-time places is decreasing. The authorities with the least full-time provision (Sutton and Hillingdon) are both Outer London Boroughs. The

[6] This figure is made up of 39 Non-Metropolitan Counties in England, 36 Metropolitan Districts, 20 Outer London Boroughs, 12 Inner London Boroughs and 8 Welsh Counties.

Metropolitan District of Salford and the Welsh County of Mid Glamorgan are the highest providers of full-time places. In 1991, Salford replaced Mid Glamorgan as the highest provider. This is because Mid Glamorgan reduced the provision of full-time places from 802 per 1,000 children in 1990 to 603 in 1991. There is a high level of variation between authorities in the provision of full-time places across the period, with the lowest providers delivering under 32 places per 1,000 children and the highest offering between 600 and 800 places. The amount of variation between authorities decreased between 1981 and 1994.

Table 3.3: Full-Time Places per 1,000 3 and 4 Year Olds in England and Wales 1981-1994

Variable	Mean	CV	Minimum	Maximum	n
FPC81	248.70	52.2	32.89(Sutton)	640.41(Salford)	95
FPC82	235.28	53.0	23.56(Sutton)	672.18(Salford)	95
FPC83	231.02	52.1	12.14(Sutton)	662.06(Salford)	95
FPC84	241.96	51.4	16.48(Sutton)	676.42(Salford)	95
FPC85	248.07	51.4	16.48(Sutton)	701.27(Salford)	95
FPC86	239.13	53.8	10.85(Sutton)	723.82(Salford)	95
FPC87	240.90	52.2	5.54(Sutton)	674.12(Salford)	95
FPC88	242.59	52.9	4.01(Hillingdon)	697.43(Salford)	95
FPC89	263.14	57.7	5.61(Hillingdon)	801.88(Mid.Glamorgan)	103
FPC90	271.39	56.4	2.77(Hillingdon)	802.97(Mid.Glamorgan)	103
FPC91	266.57	46.5	8.31(Hillingdon)	696.89(Salford)	115
FPC92	265.80	45.6	4.42(Hillingdon)	655.33(Salford)	115
FPC93	281.96	44.3	4.90(Hillingdon)	692.30(Salford)	115
FPC94	286.25	44.1	6.90(Hillingdon)	662.60(Salford)	115

Authorities:
n=95 (39 Non-Metropolitan Counties, 36 Metropolitan Districts, 20 Outer London Boroughs)
n=103 (39 Non-Metropolitan Counties, 36 Metropolitan Districts, 20 Outer London Boroughs, 8 Welsh Counties)
n=115 (39 Non-Metropolitan Counties, 36 Metropolitan Districts, 20 Outer London Boroughs, 8 Welsh Counties, 12 Inner London Boroughs)

Table 3.4 presents the figures relating to the provision of part-time places. The average provision of part-time places over the period increased by 84 places per 1,000 children (from 206 in 1981 to 290 in 1994). Authorities range from a minimum of below 1 part-time place to those with 600 part-time places per 1,000 children. Whilst the variation between authorities is high, the decreasing coefficient of variation indicates an increasing consistency in the provision of part-time places. Both urban

and rural authorities are represented amongst the high providers of part-time places. The Non-Metropolitan Counties, the Metropolitan Districts and the London Boroughs all contain authorities which are high providers of part-time places. Gloucester is prominent as the authority with the least provision of part time places. Over the period, Gloucester's provision of part-time places declined. A slight increase in full-time provision occurred in this authority (27 places per 1,000 children between 1981 and 1994). Thus the authority, in reducing its part-time provision, was not significantly enhancing full-time places.

Table 3.4: Part-Time Places per 1,000 3 and 4 Year Olds in England and Wales 1981-1994

Variable	Mean	CV	Minimum	Maximum	n
PPC81	206.34	64.1	18.90(Gloucester)	513.64(Walsall)	95
PPC82	219.53	63.0	15.39(Gloucester)	556.52(Newham)	95
PPC83	228.22	62.0	9.80(Gloucester)	571.55(Newham)	95
PPC84	228.04	60.7	11.50(Gloucester)	559.59(Wolverhampton)	95
PPC85	236.31	58.7	11.59(Gloucester)	562.78(Newham)	95
PPC86	245.51	58.8	7.25(Gloucester)	600.00(Newham)	95
PPC87	245.21	57.4	8.77(Gloucester)	581.28(Wolverhampton)	95
PPC88	255.21	55.9	7.43(Gloucester)	578.17(Wolverhampton)	95
PPC89	259.41	55.0	7.32(Gloucester)	574.71(Wolverhampton)	103
PPC90	266.09	54.6	5.35(Gloucester)	572.35((Cleveland)	103
PPC91	273.02	53.8	2.34(Gloucester)	575.73(S. Tyneside)	113
PPC92	254.95	54.1	2.21(Gloucester)	599.04(Newham)	115
PPC93	288.78	51.4	.9 (Gloucester)	610.10(Newham)	115
PPC94	290.78	50.7	1.1 (Gloucester)	611.00(Newham)	115

Authorities:
n=95 (39 Non-Metropolitan Counties, 36 Metropolitan Districts, 20 Outer London Boroughs)
n=103 (39 Non-Metropolitan Counties, 36 Metropolitan Districts, 20 Outer London Boroughs, 8 Welsh Counties)
n=115 (39 Non-Metropolitan Counties, 36 Metropolitan Districts, 20 Outer London Boroughs, 8 Welsh Counties, 12 Inner London Boroughs)

Table 3.5 presents the figures relating to the total provision of nursery places (PC). The range of variation across all authorities is wide, with W. Sussex providing 220 places per 1,000 children and Walsall offering 920 places per 1,000 children in 1994. In 1989 and 1990, West Glamorgan provided more places than the child population - this means that there were surplus places in this authority. In 1991, West Glamorgan

reduced its provision of places to 876 per 1,000 children. Across the fifteen years under review, the mean provision of places rose from 455 to 577 places per 1,000 children. Thus in 1994, 57% of three and four year olds had a local authority provided nursery education place in England and Wales. The coefficient of variation figures indicate that authorities are becoming more similar in the number of nursery places delivered. A range of urban and rural areas are represented among the highest providers (Walsall, West Glamorgan, S. Tyneside and Cleveland). In contrast, the authorities with the least provision are all rural areas.

Table 3.5: Total Places per 1,000 3 and 4 Year Olds in England and Wales 1981-1994

Variable	Mean	CV	Minimum	Maximum	n
PC81	455.04	41.7	100.0(W. Sussex)	910.0(Walsall)	95
PC82	454.81	42.2	100.0(W. Sussex)	920.0(Walsall)	95
PC83	459.24	41.6	90.0(W. Sussex)	890.0(Walsall)	95
PC84	470.00	41.3	90.0(W. Sussex)	890.0(Walsall)	95
PC85	484.38	40.4	90.0(W. Sussex)	880.0(Walsall)	95
PC86	484.54	41.0	90.0(W. Sussex)	920.0(Walsall)	95
PC87	486.11	40.1	90.0(W. Sussex)	920.0(Walsall)	95
PC88	497.80	38.7	80.0(W. Sussex)	920.0(Walsall)	95
PC89	522.55	38.4	90.0(W. Sussex)	1008.9(West Glamorgan)	103
PC90	537.48	38.4	100.0(W. Sussex)	1063.9(West Glamorgan)	103
PC91	538.82	33.6	160.0(W. Sussex)	980.0(S. Tyneside)	115
PC92	520.75	33.6	157.7(Oxfordshire)	901.3(Cleveland)	115
PC93	570.74	31.8	180.0(Bromley)	940.0(Walsall)	115
PC94	577.03	30.8	220.0(W. Sussex)	920.0(Walsall)	115

Authorities:
n=95 (39 Non-Metropolitan Counties, 36 Metropolitan Districts, 20 Outer London Boroughs)
n=103 (39 Non-Metropolitan Counties, 36 Metropolitan Districts, 20 Outer London Boroughs, 8 Welsh Counties)
n=115 (39 Non-Metropolitan Counties, 36 Metropolitan Districts, 20 Outer London Boroughs, 8 Welsh Counties, 12 Inner London Boroughs)

In Table 3.6, figures relating to the provision of nursery schools and classes per 1,000 children are presented. Whilst Gloucester provides none of its places in nursery schools and classes, across the period, other authorities provide between 553 and 684 places in these settings (Walsall, Hounslow and Newham). The coefficient of variation indicates that the variation which existed between authorities in 1981 is

decreasing. The Table shows that the average provision of nursery school and class places per 1,000 children increased between 1981-1994. However, in the authorities which provide the highest places, nursery school and class provision decreased 1992-1994. In Hounslow, nursery school and class places increased by 117 places per 1,000 3 and 4 year olds between 1982 and 1991. Between 1981 and 1994, nursery school and class provision increased by 100 places per 1,000 children.

Table 3.6: Nursery School and Class Places per 1,000 3 and 4 Year Olds in England and Wales 1981-1994

Variable	Mean	CV	Minimum	Maximum	n
NSACL81	231.61	61.5	.0(Gloucester)	553.1(Walsall)	95
NSACL82	245.97	62.8	.0(Gloucester)	621.5(Hounslow)	95
NSACL83	249.38	63.6	.0(Gloucester)	647.5(Hounslow)	95
NSACL84	245.84	62.7	.0(Gloucester)	598.5(Hounslow)	95
NSACL85	252.27	62.0	.0(Gloucester)	657.2(Hounslow)	95
NSACL86	259.94	62.5	.0(Gloucester)	691.7(Hounslow)	95
NSACL87	259.67	61.3	.0(Gloucester)	655.2(Hounslow)	95
NSACL88	268.00	60.8	.0(Gloucester)	684.4(Hounslow)	95
NSACL89	277.73	56.5	.0(Gloucester)	650.0(Hounslow)	103
NSACL90	284.81	55.8	.0(Gloucester)	666.6(Hounslow)	103
NSACL91	298.12	52.9	1.1(Gloucester)	738.0(Hounslow)	115
NSACL92	303.53	50.9	.0(Gloucester)	585.9(W.Glamorgan)	115
NSACL93	313.02	50.9	.0(Gloucester)	639.6(Newham)	115
NSACL94	313.10	50.1	.0(Gloucester)	590.3(Walsall)	115

Authorities:
n=95 (39 Non-Metropolitan Counties, 36 Metropolitan Districts, 20 Outer London Boroughs)
n=103 (39 Non-Metropolitan Counties, 36 Metropolitan Districts, 20 Outer London Boroughs, 8 Welsh Counties)
n=115 (39 Non-Metropolitan Counties, 36 Metropolitan Districts, 20 Outer London Boroughs, 8 Welsh Counties, 12 Inner London Boroughs)

Infant class provision is presented in Table 3.7. As indicated, authorities provided an average of 263 places per 1,000 children in infant schools in 1994, compared to an average of 223 in 1981. Over the period, the variation between authorities decreased. Authorities with the least provision of infant classes are Avon, Sutton, Newham and Hounslow, where a maximum of 13 places per 1,000 children are provided in infant classes. In 1981, Avon increased its provision of infant class places. Sutton, Newham and Hounslow all retained low levels of provision. N. Tyneside, Solihull and

Dyfed are amongst the highest providers of infant class places for three and four year olds. The inclusion of the Welsh Counties into the data set in 1989 meant that in the 1989-1994 period, two of these Counties provided the highest infant class places of all authorities. The provision of infant class places per 1,000 children in Dyfed decreased from 532 in 1989 to 384 in 1993. This authority, whilst continuing to provide the highest number of infant class places of all authorities, reduced its provision of full-time infant class places in 1990. Part-time places did not subsequently increase but remained at the same level.

Table 3.7: Infant Class Places per 1,000 3 and 4 Year Olds England and Wales 1981-1994

Variable	Mean	CV	Minimum	Maximum	n
INF81	223.20	42.9	8.3(Avon)	356.9(N.Tyneside)	95
INF82	209.08	42.8	13.2(Sutton)	333.2(Walsall)	95
INF83	209.86	43.2	2.5(Hounslow)	324.0(Isle of Wight)	95
INF84	224.16	42.3	11.4(Sutton)	338.7(Barking)	95
INF85	232.11	43.4	2.8(Hounslow)	377.7(Solihull)	95
INF86	224.60	44.1	8.3(Hounslow)	349.9(N.Tyneside)	95
INF87	226.45	44.2	4.8(Hounslow)	374.2(Solihull)	95
INF88	229.80	43.3	5.6(Hounslow)	348.8(Rotherham)	95
INF89	244.83	46.4	0.3(Newham)	531.9(Dyfed)	103
INF90	252.68	45.2	3.0(Sutton)	527.0(Dyfed)	103
INF91	240.70	38.6	2.0(Hounslow)	396.7(Dyfed)	113
INF92	241.38	38.0	0.3(Newham)	403.9(Dyfed)	115
INF93	257.71	35.3	0.4(Newham)	384.0(Dyfed)	115
INF94	263.93	34.0	1.4(Newham)	430.0(Powys)	115

Authorities:
n=95 (39 Non-Metropolitan Counties, 36 Metropolitan Districts, 20 Outer London Boroughs)
n=103 (39 Non-Metropolitan Counties, 36 Metropolitan Districts, 20 Outer London Boroughs, 8 Welsh Counties)
n=115 (39 Non-Metropolitan Counties, 36 Metropolitan Districts, 20 Outer London Boroughs, 8 Welsh Counties, 12 Inner London Boroughs)

In relation to the breadth of nursery provision, authorities range from those which provided 220 places per 1,000 three and four year olds with a place (W. Sussex) in 1994, to those which provided for 920 places (Walsall). In W. Sussex, which offers the least provision of places, the number of children provided with a place increased by 120 between 1981 and 1994. Most authorities provide places through a mixture of full-time and part-time provision. A comparison of Tables 3.3 and 3.4 indicates that whilst the average provision of full-time places in 1981 (248) was greater than the average provision of part-time places (206), part-time places were higher than full-time places in 1994. The expansion which has occurred in the provision of places over the period has been achieved through the creation of both part-time places and full-time places, although part-time places increased at a faster rate. Places provided in nursery schools and classes and infant classes have also increased since 1981. In comparison with the situation in 1981, the average provision of nursery school and

class places in 1994 is higher than the average provision of infant class places (Tables 3.6 and 3.7).

Whilst the average provision of all types of nursery places increased between 1981 and 1994, there are sharp distinctions between authorities. The area in which children live influences the type of nursery provision which is available to them. Walsall and W. Glamorgan provide a nursery place for a large proportion of the three and four year old population. Many of these places are provided in nursery schools and classes. These authorities can be contrasted with Gloucester which offers few places in these settings and few part-time places generally. With the exception of W. Glamorgan, Welsh authorities are high providers of nursery education in infant classes. Two of these authorities, Gwynedd and Powys, offer no nursery school places (although they do provide infant class places). The Welsh authorities all decreased their provision of infant classes in primary schools between 1990 and 1991, but did not significantly increase nursery school and class provision as a consequence. The contraction of infant class places may have been caused by an increase in the number of primary school children in Wales who were given priority over nursery age children. An alternative explanation is that the decrease was influenced by a Welsh Office policy to reduce surplus primary school places. The provision of infant class places increased in most Welsh authorities after 1991.

Cleve *et al's* (1985) study of local authority admissions policies indicated that the Non-Metropolitan County areas were least likely to permit the entry of children to school prior to statutory school age. In comparison, the Metropolitan Districts and London Boroughs were more likely to have early admission policies. This examination of the breadth of provision has indicated that that the highest providers of nursery places are authorities within the Metropolitan Districts and the London

Boroughs and that the lowest, with some exceptions, are Non-Metropolitan County areas. The Metropolitan Districts of Walsall and S. Tyneside, for example, and the London Boroughs of Newham and Hounslow have the highest number of nursery places. The exceptions are: the London Borough of Hillingdon, which is a low provider of full-time places, and the Non-Metropolitan Counties of Cleveland and many of the Welsh Counties, which are high providers of nursery places.

Tables 3.8 - 3.10 present figures relating to the depth of nursery education provision. Table 3.8 presents information relating to the depth of provision: expenditure per pupil within nursery schools (NEXPP). Much of the expenditure data is incomplete within government publications and is not available for many authorities. However, some patterns in expenditure can be deduced. The average per pupil net expenditure on nursery schools increased between 1981-1987 from £598.58 to £875.32. The variation between authorities is wide. In 1987, for example, the authority which had the lowest per pupil expenditure (St. Helens) spent 14 times less than the authority which had the highest per pupil expenditure (Sefton). Sefton consistently spent the highest amount of money per pupil between 1981-1987.

Table 3.8: Net Expenditure per Pupil in Nursery Schools in England and Wales 1981-1987

Variable	Mean	CV	Minimum	Maximum	n
NEXPP81	598.58	36.5	143.88(Northamptonshire)	1739.73(Sefton)	87
NEXPP82	667.83	52.3	142.86(St.Helens)	1743.59(Sefton)	86
NEXPP83	675.79	36.3	156.55(St.Helens)	1986.49(Sefton)	85
NEXPP84	686.38	37.4	167.20(St.Helens)	2146.67(Sefton)	83
NEXPP85	725.41	41.2	165.08(St.Helens)	2428.57(Sefton)	83
NEXPP86	767.88	40.3	180.38(St.Helens)	2355.26(Sefton)	83
NEXPP87	875.32	39.3	188.09(St.Helens)	2671.23(Sefton)	82

Authorities:
87=excludes Dorset, Gloucester, Hereford and Worcester, Isle of Wight, Wiltshire, Knowsley, Doncaster, Solihull, Barking, Bromley, Enfield, Havering, Hounslow, Redbridge, Gwynedd and Powys.
86=excludes Dorset, Gloucester, Hereford and Worcester, Isle of Wight, Wiltshire, Knowsley, Doncaster, Solihull, Barking, Bromley, Enfield, Harrow, Havering, Hounslow, Redbridge, Gwynedd and Powys.
85=excludes Dorset, Gloucester, Hereford and Worcester, Isle of Wight, Wiltshire, Oldham, Knowsley, Doncaster, Solihull, Barking, Bromley, Enfield, Harrow, Havering, Hounslow, Redbridge, Gwynedd and Powys.
83=excludes Dorset, Gloucester, Hereford and Worcester, Isle of Wight, Somerset, Wiltshire, Oldham, Trafford, Knowsley, Doncaster, Solihull, Barking, Bromley, Enfield, Harrow, Havering, Hounslow, Redbridge, Gwynedd and Powys.
82=excludes Dorset, Gloucester, Hereford and Worcester, Isle of Wight, Somerset, Wiltshire, Oldham, Trafford, Knowsley, Doncaster, Solihull, Barking, Bromley, Enfield, Harrow, Havering, Hounslow, Merton, Redbridge, Gwynedd and Powys.

An examination of net expenditure levels between 1981 and 1987 indicates that the variation between authorities in terms of the amounts spent on nursery schools is high. As expenditure represents a measure of service input, variations which exist between authorities may be caused by differing rates of efficiency, for example. Table 3.8 presented the figures relating to expenditure per pupil on nursery schools. Whilst St. Helens spends £188.09 per pupil and Sefton £2671.23, the actual service received by nursery children, in theory, might be the same - St. Helens may provide its service with less resources than Sefton. However, it is unlikely that the large difference between the authorities can be explained by savings in production costs and efficiency. It is possibly even more unlikely given that the two authorities are neighbouring boroughs in which the costs of producing services are likely to be relatively similar. The vast differences in expenditure levels indicates the level of variation in the provision of nursery education which exists across England and Wales.

Table 3.9 provides figures on teachers within nursery schools and classes per 1,000 pupils. The figures show that over the period, the average number of teachers decreased between 45.06 and 40.66 per 1,000 pupils. This means that there were more pupils per teacher, representing a decrease in service provision. Since Gloucester provides none of its nursery places in nursery schools and classes, this authority provides no teaching staff in these forms of provision. The next minimum providers of teaching staff have been presented in Table 3.9. These authorities are Dudley, Staffordshire and Walsall. All of these authorities are located in the Midlands region of England. Walsall is prominent as an authority which provides a low number of teachers per 1,000 pupils. In 1994, for example, this authority provided 13 teachers per 1,000 pupils in nursery schools and classes. This represents a pupil:teacher ratio of 76:1. Many of the London Boroughs are the high providers of teaching staff. The coefficient of variation for this indicator are lower than those for the other measures of provision. In relative terms, therefore, local authorities are much more similar in the provision of teaching staff in nursery education than they are in the level and type of nursery places offered and expenditure in nursery schools.

Table 3.9: Teachers per 1,000 pupils in Nursery Schools and Classes 1981-1994 in England and Wales

Variable	Mean	CV	Minimum	Maximum	n
TEACH81	45.06	14.3	24.39(Dudley)	64.10(Sunderland)	94
TEACH82	43.76	13.3	25.25(Dudley)	59.52(Haringey)	94
TEACH83	43.30	13.5	25.64(Dudley)	57.14(Northamptonshire)	94
TEACH84	42.19	16.2	10.31(Walsall)	55.25(Hounslow)	94
TEACH85	42.11	13.6	24.81(Staffordshire)	55.87(Haringey)	93
TEACH86	41.61	14.7	25.00(Staffordshire)	61.73(Bromley)	93
TEACH87	42.66	15.0	12.47(Walsall)	58.82(Haringey)	94
TEACH88	43.03	14.4	11.29(Walsall)	59.52(Haringey)	94
TEACH89	42.78	16.0	11.14(Walsall)	60.24(Haringey)	94
TEACH90	41.94	15.2	11.40(Walsall)	58.37(Haringey)	94
TEACH91	42.64	15.0	12.09(Walsall)	58.48(Haringey)	106
TEACH92	42.30	14.8	14.09(Walsall)	58.14(Haringey)	106
TEACH93	41.63	14.4	14.03(Walsall)	52.91(Westminster)	106
TEACH94	40.66	14.4	13.51(Walsall)	53.19(Tower Hamlets)	106

Authorities:

n=94 (38 Non-Metropolitan Counties [excluding Gloucester], 36 Metropolitan Districts, 20 Outer London Boroughs).

n=93 (38 Non-Metropolitan Counties [excluding Gloucester], 35 Metropolitan Districts [Walsall has been excluded in 1985 and 1986 since the data is missing for this variable], 20 Outer London Boroughs).

n=106 (38 Non-Metropolitan Counties [excluding Gloucester], 35 Metropolitan Districts, 20 Outer London Boroughs, 12 Inner London Boroughs)

Table 3.10 presents the figures relating to staff per 1,000 nursery school and class pupils. As outlined above, staff consist of nursery teachers and nursery nurses/assistants. Gloucester has again been excluded since the authority does not provide nursery schools and classes. The average number of staff per 1,000 pupils in 1981 was 99.71. By 1994, this had decreased to 90.35 staff. This represents a decrease of 9 less staff per 1,000 pupils over the period. Calculated in pupil:staff ratio terms, there was one member of staff responsible for 10.0 pupils in 1981 and for 11.0 pupils in 1994. The coefficient of variation, similar to that for teaching staff (TEACH), suggests that the variation in staffing between local authorities is not as high as that for nursery places or expenditure. A range of county, metropolitan district and outer London boroughs are represented amongst the authorities with the lowest and the highest levels of staffing.

Table 3.10: Total Staff per 1,000 pupils in Nursery Schools and Classes 1981-1994 in England and Wales

Variable	Mean	CV	Minimum	Maximum	n
STAFF81	99.71	12.6	70.42(Nottinghamshire)	129.87(Bromley)	94
STAFF82	96.61	12.3	74.63(Enfield)	128.21(Haringey)	94
STAFF83	94.88	12.4	71.94(Hereford & Worcester)	135.14(Wolverhampton)	94
STAFF84	93.94	13.5	40.42(Hereford & Worcester)	144.93(Somerset)	94
STAFF85	93.78	11.9	71.94(Enfield)	136.99(Bromley)	94
STAFF86	94.32	13.7	68.49(Enfield)	131.58(Isle of Wight)	94
STAFF87	96.03	12.9	71.43(Trafford)	136.99(Haringey)	94
STAFF88	96.91	13.7	69.93(Enfield)	138.89(Haringey)	94
STAFF89	94.94	13.3	71.43(Richmond)	135.14(Haringey)	94
STAFF90	94.31	13.3	71.94(Oldham)	131.58(Haringey)	94
STAFF91	93.13	13.2	70.11(Oldham)	129.87(Somerset)	106
STAFF92	91.42	12.0	69.93(Hereford & Worcester)	120.48(Isle of Wight)	106
STAFF93	90.78	10.8	72.46(Doncaster)	119.05(Somerset)	106
STAFF94	90.35	11.1	72.46(Dorset)	121.95(Islington)	106

Authorities:
n=94 (38 Non-Metropolitan Counties [excluding Gloucester], 36 Metropolitan Districts, 20 Outer London Boroughs).
n=106 (38 Non-Metropolitan Counties [excluding Gloucester], 35 Metropolitan Districts, 20 Outer London Boroughs, 12 Inner London Boroughs)

In terms of the depth of nursery provision, Tables 3.8-3.10 have shown that increases and decreases in the depth of provision occurred between 1981 and 1994. Average expenditure per pupil rose by £276 between 1981 and 1987. In contrast, teaching and non teaching staff decreased between 1981 and 1994. In 1994, there were both more pupils per staff member than there were in 1981. It is notable than in some areas, for example, Haringey, a high level of provision of both teaching staff and other staff exist. Some geographical patterns in the provision of staffing can be deduced. All types of authority are represented amongst the lowest providers of total staff. In relation to teaching staff, Table 3.9 has highlighted that the lowest provision is found in authorities located in the Midlands area of England. Many of the London authorities provide the highest provision of both teaching and total staff within their areas.

Table 3.11 presents figures relating to total provision: net expenditure within nursery schools per 3 and 4 year old. Between 1981 and 1987, the mean level of expenditure per child increased by £10.23. In Leicestershire, the authority which spends the least, net expenditure decreased by £0.37 between 1982 and 1987. In comparison with the measures of provision examined above, the coefficient of variation is relatively high, indicating that variation between authorities in terms of expenditure per child is high. Whilst Leicestershire spent only £0.67 per child aged 3 and 4 in 1987, Lancaster allocated £195.30 per child. The average for all authorities in 1987 is £43.81 per child.

Table 3.11: Net Expenditure per 3 and 4 Year Old in Nursery Schools in England and Wales 1981-1987

Variable	Mean	CV	Minimum	Maximum	n
NEXTC81	33.58	95.7	0.26(Gloucester)	215.57(S.Tyneside)	82
NEXTC82	36.83	95.7	1.04(Leicestershire)	228.62(S.Tyneside)	81
NEXTC83	35.99	84.5	1.02(Leicestershire)	148.41(S.Tyneside)	79
NEXTC84	36.58	83.8	1.11(Leicestershire)	143.81(Salford)	78
NEXTC85	38.43	84.5	1.08(Leicestershire)	167.76(Salford)	77
NEXTC86	38.91	78.2	1.56(Leicestershire)	162.51(Salford)	77
NEXTC87	43.81	82.7	0.67(Leicestershire)	195.30(Salford)	77

Authorities:
87=excludes Dorset, Hereford and Worcester, Isle of Wight, Wiltshire, Knowsley, Doncaster, Solihull, Barking, Bromley, Enfield, Havering, Hounslow and Redbridge.
81= excludes Dorset, Gloucester, Hereford and Worcester, Isle of Wight, Wiltshire, Knowsley, Doncaster, Solihull, Barking, Bromley, Enfield, Havering, Hounslow and Redbridge.
79= excludes Dorset, Gloucester, Hereford and Worcester, Isle of Wight, Wiltshire, Oldham, Knowsley, Doncaster, Solihull, Barking, Bromley, Enfield, Harrow, Havering, Hounslow and Redbridge.
78= excludes Dorset, Gloucester, Hereford and Worcester, Isle of Wight, Somerset, Wiltshire, Oldham, Knowsley, Doncaster, Solihull, Barking, Bromley, Enfield, Harrow, Havering, Hounslow and Redbridge.
77= excludes Dorset, Gloucester, Hereford and Worcester, Isle of Wight, Somerset, Wiltshire, Oldham, Trafford, Knowsley, Doncaster, Solihull, Barking, Bromley, Enfield, Harrow, Havering, Hounslow and Redbridge.

Table 3.12 presents the data relating to the '% of all nursery places which are provided in nursery schools and classes'. This measure represents an indicator of the proportion of all nursery places which are provided in quality nursery education settings. As indicated, the average provision of nursery school and class places is

between 48% and 51% over the period. Since 1986, the average provision of quality nursery education in all authorities has been over 50%. Gloucester had no quality nursery provision, with the exception of .37% in 1991. This was because the authority provided one nursery school place in this year. The wide variation in the extent to which authorities provide nursery school and class provision is apparent in Table 3.12. Whilst Gloucester provides none of its places in schools and classes, other authorities use these types as the dominant form of nursery provision (Sutton, Newham and Hounslow). Each of these high providers of nursery school and class provision are London Boroughs.

Table 3.12: % Quality Places (Nursery School and Classes) in England and Wales 1981-1994

Variable	Mean	CV	Minimum	Maximum	n
QUALP81	48.62	40.4	.00(Gloucester)	93.60(Avon)	95
QUALP82	50.71	39.6	.00(Gloucester)	97.10(Hounslow)	95
QUALP83	50.85	40.3	.00(Gloucester)	99.62(Havering)	95
QUALP84	49.35	40.4	.00(Gloucester)	92.86(Sutton)	95
QUALP85	49.31	41.2	.00(Gloucester)	99.58(Hounslow)	95
QUALP86	50.56	40.7	.00(Gloucester)	98.81(Hounslow)	95
QUALP87	50.59	40.8	.00(Gloucester)	99.27(Hounslow)	95
QUALP88	50.78	41.6	.00(Gloucester)	99.19(Hounslow)	95
QUALP89	50.78	40.5	.00(Gloucester)	99.95(Newham)	103
QUALP90	50.75	40.9	.00(Gloucester)	99.02(Sutton)	103
QUALP91	52.42	37.9	.37(Gloucester)	99.74(Hounslow)	115
QUALP92	52.91	37.8	.00(Gloucester)	99.96(Newham)	115
QUALP93	51.99	37.5	.00 (Gloucester)	99.90(Newham)	115
QUALP94	51.61	37.5	.00 (Gloucester)	99.80(Newham)	115

Authorities:
n=95 (39 Non-Metropolitan Counties, 36 Metropolitan Districts, 20 Outer London Boroughs)
n=103 (39 Non-Metropolitan Counties, 36 Metropolitan Districts, 20 Outer London Boroughs, 8 Welsh Counties)
n=115 (39 Non-Metropolitan Counties, 36 Metropolitan Districts, 20 Outer London Boroughs, 8 Welsh Counties, 12 Inner London Boroughs)

An examination of the proportion of all places which is provided in nursery schools and classes as distinct from infant classes (Table 3.12) indicates that authorities vary

widely in the quality of their provision. Whilst Gloucester provides no quality places, Newham, Sutton and Hounslow provide 99%.

This examination of service provision has revealed that the breadth of nursery provision has increased over the period. There have been increases in the breadth of provision represented by full-time, part-time, nursery school and class places. The total dimension has also increased with higher levels of places (breadth) and greater expenditure per child (depth) in 1987 than in 1981. Depth of provision has been enhanced through additional resources per pupil. At the same time, depth of provision in terms of staffing has decreased over the period. This may suggest that real spending declined. The average provision of quality places in nursery education has also increased.

Undoubtedly, these increases in service provision highlight that the breadth, total and quality of nursery education for three and four year olds are more favourable in 1994 than in 1981. However, the geographical variations between authorities should not be overlooked. Whilst some areas provide up to 92% of children with a nursery place (Walsall), it remains the case that others provide for 22% of three and four year olds (W. Sussex). Children living in Gloucester, for example, have very little part-time provision available to them. In contrast, Newham provides nearly 600 part-time places per 1,000 children. Gloucester provides no quality nursery school and class places whilst Newham offers 100% quality nursery education. The level of variation between authorities is similarly high in terms of both expenditure and staffing. The difference between Leicester with a low level of net expenditure per child and both S. Tyneside and Salford which have a high level per child is also immense. In terms of the depth of provision, the contrast between St. Helens and Sefton in the amount spent per pupil has already been highlighted. Sharp variations in the staffing of

nursery education have also been highlighted. These large differences are unlikely to be wholly explained by variations in production costs or efficiency rates.

Geographical variations in the provision of nursery education have been focused on in this section of the Chapter. It is clear that levels of provision vary between different local authorities in England and Wales. These variations mean that there is inequality in the provision of nursery education.

B. The Correlation Between Indicators of Nursery Education Provision

Inter-authority variations in the provision of nursery education have been highlighted. In order to identify the relationship between different measures of service provision, the correlation between them can be examined. This allows questions such as 'do authorities which deliver high levels of nursery places also spend the greatest amounts per pupil?' to be addressed. Tables 3.13 - 3.27 present the average correlation between each of the indicators of nursery provision and the correlation in each year between 1981 and 1994. The average correlation between the indicators of provision 1981-1994 is presented in Table 3.13. Although many of the correlations presented in the Table are significant, the correlations are quite low. It is apparent from the correlations presented in Table 3.13 that there is no relationship between full-time places (AVFPC) and part-time places (AVPPC). The correlation between the average provision of full-time places and infant classes (AVINF) is strong. This is expected since infant classes operate within the framework of primary education provision which is always offered on a full-time basis. Similarly, the correlation between nursery school and class places (AVNSACL) and part-time provision (AVPPC) is strong. Again, this correlation is predicted since nursery schools and class places are normally provided on a part-time basis. Authorities which are high

providers of total nursery places (AVPC) may not always be those which spend the most per pupil in nursery schools (AVNEXPP).

Table 3.13: The Average Correlation Between Indicators of Nursery Education Provision 1981-1994 [7]

	AVFPC	AVPPC	AVPC	AV NSACL	AVINF	AV QUALP	AV NEXPP	AV NEXTC	AV TEACH	AV STAFF
AVFPC	1.0000									
AVPPC	.0316	1.0000								
	***	***								
AVPC	.6693	.7637	1.0000							
	***	***	***							
AVNSACL	.3625	.8716	.8840	1.0000						
	***		***							
AVINF	.7753	.0786	.5592	.1068	1.0000					
	***	***	***	***						
AVQUALP	-.1077	.6874	.4144	.7749	-.4355	1.0000				
	***		*	*	*	*				
AVNEXPP	.4006	-.0026	.2773	.2123	.2340	.0772	1.0000			
	***	*	***	***			*			
AVNEXTC	.4398	.2718	.5070	.5040	.2120	.2122	.2709	1.0000		
AVTEACH	.0380	-.0302	.0033	-.0399	.0702	-.1094	.1074	.2045	1.0000	
							***	***		
AVSTAFF	.1742	.0791	.1695	.1222	.1452	-.0066	.0693	.4578	.4711	1.0000

Key:

Significance levels:

*	0.05 or better
**	0.01 or better
***	0.001 or better

Variables:

AVFPC	Average full-time places per 1000 3 & 4 year olds 1980-1994
AVPPC	Average part-time places per 1000 3 & 4 year olds 1980-1994
AVPC	Average total places per 1000 3 & 4 year olds 1980-1994
AVNSACL	Average nursery school and class places per 1000 3 & 4 year olds 1980-1994
AVINF	Infant class places per 1000 3 & 4 year olds 1980-1994
AVNEXPP	Average net expenditure in nursery schools per pupil 1980-1987
AVTEACH	Average teachers in nursery schools and classes per 1,000 pupils 1980-1994
AVSTAFF	Average total staff in nursery schools and classes per 1,000 pupils 1980-1994 (includes non-teaching staff)
AVNEXTC	Average net expenditure in nursery schools per 3 & 4 year old 1980-1987
AVQUALP	Average % of all places provided in nursery schools and classes 1980-1994.

[7] In this, and all subsequent Tables in this study, a two-tailed significance test has been used.

In terms of nursery setting, the correlation between nursery school and class places (AVNSACL) and infant class places (AVINF) is not significant. These forms of provision are therefore not viewed by local authorities as complementary, nor substitutes, for each other. The insignificant correlation also implies that these forms of nursery provision are not alternatives - authorities which provide no nursery school and class places are not those which provide high infant class places.

The significant positive correlations between indicators of the breadth of provision (AVFPC and AVPC) and the depth of provision represented by nursery school expenditure per pupil (AVNEXPP) indicate that authorities which are high providers of breadth also offer high depth of provision. This is more apparent in full-time places where the correlation is highest. However, it is not the case in part-time provision where the relationship between part-time places and expenditure per pupil is not significant. In terms of the association between the breadth dimension of nursery services (nursery places) and depth of provision, represented by staffing (AVTEACH and AVSTAFF), the correlations indicate that the relationship is insignificant in the majority of cases. This means that high breadth of nursery education (nursery places) is not related to high depth (staffing). The correlation, for example, between nursery schools and class places (AVNSACL) and teaching staff (AVTEACH) is not significant. As both measures relate to nursery schools and classes, this correlation is important because it means that the breadth of nursery school and class provision is not related to the depth of nursery services. There is a weak correlation between nursery school places (AVNSACL) and total staff (AVSTAFF). The insignificant correlations between both of the staffing measures and other indicators of provision sharply contrasts with other variables where the relationships are mostly positive. This suggests that staffing is separate from the other

indicators of provision. Apart from the positive correlation between the indicators of staffing (AVTEACH and AVSTAFF), which is influenced by the inclusion of teaching staff within AVSTAFF, the only other positive relationship is the correlation between both teachers and total staff and expenditure per 3 and 4 year old. This suggests that the relationship between the depth of provision and total provision is positive.

Total provision (AVNEXTC) is positively related to the majority of the indicators of breadth and depth of provision. Thus high levels of expenditure per 3 and 4 year old are associated with high provision of places and staffing. Of the correlations, those between AVNEXTC and both total places (AVPC) and total staff (AVSTAFF) are strongest. All of these correlations might be stronger if the expenditure figures related to all of the three types of provision, rather than nursery schools only. Authorities which provide the greatest provision of places overall and total staff are also likely to spend the highest amount of money per child.

In terms of the correlation between quality places (AVQUALP) and the other indicators of provision, the figures show that quality is negatively related to infant class places (AVINF). This correlation is anticipated as quality has been measured as nursery school and class provision and not infant class places. Quality provision is strongly correlated with part-time places (AVPPC) and nursery school and class places (AVNSACL).

The correlations between the indicators of nursery education provision in each year are presented in Tables 3.14-3.27 (see Appendix I). An examination of the figures highlights the changes which occurred between the years. Although the average provision of full-time and part-time places is not significant (Table 3.13), these

modes of provision become more negatively correlated with each other between 1991 and 1994. The negative correlations, whilst not significant, suggest a trend in which part-time and full-time provision are alternatives for each other. Thus authorities provide nursery places either on a part-time or full-time basis rather than both of these. Whilst the strength of the correlation between full-time places (FPC) and infant school places (INF) is strong across all of the years 1981-1994, the correlation fell in 1991 and began to rise again between 1992-1994. This suggests that infant class provision, although predominantly delivered on a full-time basis, may also have been used in some areas to offer part-time places. This practice is unlikely to have been widespread across authorities because the correlation between infant classes and part-time provision is not significant between 1991-1994. It is notable that the correlation between these was significant in 1981 - part-time places were positively correlated with infant class provision. Since this time, infant class places are more likely to be full-time.

The stronger correlation between nursery school and class places (NSACL) and total places (PC) than infant class places (INF) and total places (PC) suggests than an expansion in nursery places is more associated with increases in nursery school and class provision than infant class places. Thus nursery places are more likely to be provided in nursery schools and classes than in infant classes in primary schools. In the period 1990-1994, infant classes are not as strongly related to total places as they were 1981-1989. In contrast, nursery school and class places are more strongly related. This suggests that an expansion in nursery places was made possible through the provision of greater nursery school and class places per 1,000 children.

The average correlations presented in Table 3.13 highlighted that nursery school and class provision and infant class places are neither alternatives for, nor complementary

to, each other. The annual correlations indicate that in 1981, NSACL and INF are positively and significantly correlated with each other. The correlation is .2752. This may indicate that in 1981, these forms of provision were complementary to each other. Thus authorities which provided high nursery school and class places also offered high infant class places. This did not occur in subsequent years where nursery schools and classes are insignificantly related to infant class places.

The average figures disguise the correlation between both teaching and total staff and other indicators of service provision. The examination of the average figures illustrated that the provision of staff resources (AVSTAFF) was only significantly correlated with nursery school and class places (AVNSACL), expenditure per 3 and 4 year old (AVNEXTC) and teaching staff (AVTEACH). The correlations for each year indicate that total staff (STAFF) was also positively and significantly related to total places (PC) between 1981 and 1983 and 1986 and 1987. The correlation between total staff and part-time places is also significant in 1982. The depth of provision, indicated by STAFF, was therefore related to the breadth of provision, represented by PC, in these years.

The average provision of teaching staff in Table 3.13 indicated that AVTEACH was only positively correlated with nursery school expenditure per child (NEXTC). An examination of the individual years highlights that teaching staff are positively correlated with expenditure per 3 and 4 year old in 1981,1982 and 1985 and with expenditure per pupil in 1986. High expenditure is associated with additional teaching staff in nursery schools and classes in these years.

An examination of the correlations between the % of quality nursery education places (QUALP) and the other indicators indicates that quality is positively related to part-

time places, total places, nursery school and class places between 1981-1994 and expenditure per child 1981-1987. The correlation between % quality provision and both nursery school and class places and part-time places is stronger in 1994 than 1981. This means that quality places become increasingly provided on a part-time basis in nursery schools and classes.

This examination of the correlation between the separate indicators of provision has revealed that the breadth of provision, nursery places, is positively related to total provision (NEXTC) and depth of provision, represented by NEXPP and STAFF (in some years). Breadth of nursery provision is not significantly related to depth, measured in terms of teaching resources. Increases in nursery places are, in general, matched by rises in per pupil and per child expenditure levels. In contrast, staff resources cannot be associated with increases in nursery places or expenditure per pupil. The proportion of quality provision which is delivered is positively related to part-time, total places, nursery school and class places and net expenditure per 3 and 4 year old. Quality can not be associated with full-time provision, infant class places or staffing within nursery establishments.

The staffing indicators are clearly not correlated with many of the other measures. Of the two measures, only STAFF is positively correlated with net expenditure in nursery schools and nursery school and class provision 1981-1983 and 1986-1989. On average, TEACH is not significantly correlated with any other indicator (except STAFF which is contained within TEACH). The measures of staffing are therefore separate from the other measures of provision contained within this study.

Whilst these Tables have highlighted the significant positive and negative correlations between the indicators of nursery provision, the correlations, in general are not high.

This means that each of the indicators of provision represents a distinctive and separate element of the provision of nursery education. Authorities which are high providers on the basis of one measure of service are not necessarily high on other measures of provision.

C. The Variations Within Nursery Education Provision 1981-1994

This section of the Chapter focuses on the correlation between the indicators of provision over time in order to determine whether the pattern of nursery education provision is stable. From an examination of the correlation between indicators of need and provision in consecutive years, the extent to which authorities maintained levels of provision can be determined.

Table 3.28 presents the average correlation between the variables in consecutive years. Also presented is the coefficient of variation together with the years in which the minimum and maximum correlation is obtained. The average correlations show that, over time, the provision of nursery education is stable. This is particularly the case in relation to the provision of nursery places (FPC, PPC, PC, NSACL, INF) and the quality of provision (QUALP) where the average correlation is at least .9400. Nursery school and class provision (NSACL) is the most stable over time. Of all the variables, the average correlation relating to net expenditure per pupil is the lowest. The higher coefficient of variation for both NEXPP and NEXTC indicates that there is most variation within these indicators over time.

Table 3.28: The Correlation Between the Indicators of Nursery Education Provision 1981-1994

Variable	Average Correlation *	CV	Minimum	Maximum
FPC	.9750	1.71	.9342(1990 & 1991)	.9957(1988 & 1989)
PPC	.9828	1.41	.9492(1990 & 1991)	.9958(1983 & 1984)
PC	.9795	1.51	.9426(1990 & 1991)	.9953(1988 & 1989)
NSACL	.9906	0.81	.9795(1981 & 1982)	.9879(1993 & 1994)
INF	.9459	4.18	.8606(1990 & 1991)	.9901(1988 & 1989)
NEXPP	.8785	9.96	.7121(1981 & 1982)	.9654(1984 & 1985)
TEACH	.9270	4.07	.8312(1983 & 1984)	.9694(1990 & 1991)
STAFF	.9141	3.84	.8473(1983 & 1984)	.9418(1982 & 1983)
NEXTC	.9380	6.08	.8491(1986 & 1987)	.9918(1981 & 1982)
QUALP	.9758	2.48	.9088(1981 & 1982)	.9940(1983 & 1984)

* Note: the average correlation is obtained by summing the correlations between the variables for each year and dividing this figure by their number.

Variables

FPC Full-time places per 1000 3 & 4 year olds 1980-1994
PPC Part-time places per 1000 3 & 4 year olds 1980-1994
PC Total places per 1000 3 & 4 year olds 1980-1994
NSACL Nursery school and class places per 1000 3 & 4 year olds 1980-1994
INF Infant class places per 1000 3 & 4 year olds 1980-1994
NEXPP Net expenditure in nursery schools per pupil 1980-1987
TEACH Teachers in nursery schools and classes per 1,000 pupils 1980-1994
STAFF Total staff in nursery schools and classes per 1,000 pupils 1980-1994 (includes non-teaching staff)
NEXTC Net expenditure in nursery schools per 3 & 4 year old 1980-1987
QUALP % of all places provided in nursery schools and classes 1980-1994.

An analysis of the minimum and maximum years indicates that the correlation between a number of the measures in 1991 and 1991 is the lowest of all the years. For example, the minimum correlation between FPC in 1990 and 1991 is .9342 in

comparison with the average of .9750. The 1991 levels of provision of full-time places were not as closely related to those which existed in the previous year. Since this also applies to part-time places, total places and infant class places, it may suggest that there was a shift in the overall pattern of nursery place provision in 1991. The correlations between a number of the variables in both 1983 and 1984 and 1988 and 1989 are strongest. The provision of part-time places, nursery school expenditure per pupil and nursery school expenditure per child are most closely correlated with those in 1983. Similarly, full-time and infant class places in 1989 are closely correlated with provision in 1988. This implies that the pattern of provision in both 1984 and 1989 closely matched provision in the previous years.

Overall, the pattern presented in Table 3.28 indicates that the provision of nursery education is stable over time. Levels of service delivered in one year are strongly related to those provided in the previous and in the following year. This stability suggests either equity or inequity in the pattern of nursery education provision.

Conclusion

This Chapter has examined the provision of nursery education in England and Wales between 1981 and 1994. It has focused on the measurement of the breadth, depth and total dimensions of nursery provision together with the quality of nursery services. These indicators were used to measure the provision of nursery education between 1981 and 1994. The discretionary nature of the service means that local authorities do not have to provide a specific level of nursery education. Over the period, both the breadth and depth of nursery education, represented by expenditure per pupil, have increased. Total provision has also increased. The quality of nursery services is higher in 1994 than in 1981. The depth of provision in terms of staffing levels has contracted. Although the increases in provision which have occurred are

likely to have had a favourable impact on children's access to nursery services and the amount of service received by them, the existence of wide variations between authorities mean that in some areas, children may not have the same provision of nursery services as other areas. The Chapter has revealed that the variation between local education authorities in the provision of nursery education is high. Thus whilst some areas provide a nursery place for almost every child aged three and four, for example, other authorities only provide for 20% of children. The quality of nursery services is also subject to wide variation. The proportion of quality nursery education in some authorities is very low in comparison with other areas. The examination of the relationship between the indicators of nursery provision has revealed that the delivery of high breadth of nursery education is not generally associated with the provision of high depth. Over time, the provision of nursery education is stable in which the patterns of service delivered in one year strongly related to those in the previous year. This Chapter has established that inequality exists in the provision of nursery education. In order to identify whether there is also inequity in the pattern of service provision, it is necessary to define and measure the need for nursery education. It is to the issue of need that this study now turns.

Chapter 4: The Need for Nursery Education

Introduction

This Chapter examines the concept of need in nursery education. It is divided into three parts. Part one is concerned with a discussion of the concept of need in nursery education. The needs of all children aged three and four and the needs of disadvantaged children for nursery education are examined. In the identification of disadvantage, a range of socio-economic factors which contribute to disadvantage are identified. Those which are deemed to be most relevant to the measurement of the need for nursery education are selected. Three approaches to the measurement of need in nursery education are developed. In part two, a range of indicators of nursery educational need is developed. Part three of the Chapter identifies the level of nursery educational need within local authority areas in England and Wales.

I: The Concept of Need in Nursery Education

The origins of the policy which made education in Britain compulsory between the ages of five and thirteen were the Education Acts of 1870 and 1876. Whilst there has been no change in the statutory age of entry to school in England and Wales [8], the leaving age of thirteen, established in 1870, was amended by the Education Acts of 1876, 1936 and 1944. The leaving age of sixteen was implemented in 1972/3. During the Parliamentary discussion which preceded the 1870 Act, the age of five was decided on for entry to primary school on the basis of arguments other than those of an educational nature (Woodhead 1989:8). An early start date in education meant that children could leave school earlier and enter employment. In addition, the entry of children of five years into schools would remove children from the slum conditions which they faced. The educational development of children was not considered and

[8] N. Ireland differs from the rest of the UK in having a compulsory age of four rather than five. Since 1990-91, children in N. Ireland who are four by 1 July begin school in the following September.

the selection of five as the age of entry to compulsory schooling can be considered an "arbitrary one".

The first official recognition of the educational needs of children under five was the Education Act 1918 which allowed local authorities to develop nursery schools. As highlighted in the historical review of nursery education, the development of nursery schools has been subject to the availability of local revenue to support them and a view that the most appropriate environment for young children is in the home. The fact that nursery education is not universally available for all children under five reflects these circumstances. The educational needs of children under five have rarely been considered. The entry of children into primary schools since the 1960s has been driven by falling rolls. In admitting children under five, primary schools have also responded to demands from parents for schooling prior to the statutory age. In a recent survey of parental preferences of day care for children, (Meltzer 1994), it is reported that 80% of parents of parents who had children in nursery schools and classes had selected this setting as their first choice. Of those parents whose children were not attending nursery schools or classes, 18% of parents wished them to.

Education represents one of the most basic and primary needs of an individual. It is education which can offer an individual access to, and use of, other basic services such as employment, housing and health care (Doyal and Gough 1991). Both parents and educationalists justify expenditure on education on the grounds that it is necessary in order for an individual to fully participate in society (Peters 1973).

Nursery education provision forms an integral element of a complete education system. Although the receipt of nursery education in itself does not guarantee that an individual will be in a position to participate more effectively in society, many argue

that education between the age of three and five years contributes to the educational and social development of young children (e.g. Department of Education and Science, 1972, Thompson 1972). This view is supported by Webb (1974) who concludes that attendance at nursery school is related to the development of initiative, orderliness, level of attention span, and the degree of independence of a child. Nursery education offers an individual the opportunity to make social and educational advancements prior to attendance at compulsory schooling (Bell 1976). It represents, according to the Plowden Report (1967), the first stage in the education process in which all children should participate. In the Guidance and Regulations relating to the Children Act 1991, the Department of Health (1991:43) argues that "nursery education has value in terms of present benefits to many young children as well as in terms of their preparation for the years of compulsory schooling". Children who do not receive nursery education may therefore be placed at a disadvantage prior to attendance in the first formal stages of primary education.

Recent research of the value of nursery education draws similar conclusions. In particular, both educationalists and politicians in Britain point to an American study which 'proved' the value of pre-school education. The High/Scope Perry Preschool study (Schweinhart *et al* 1993) reports the effects of pre-school education on children from their attendance at 3 years through to age 27. The reports findings conclude that children who received pre-school education were those who were likely to earn most money, own their own home, leave school later and less likely to have had contact with social services or be involved in criminal activity than other children. In a British study of Key Stage 1 tests of seven year olds Shorrocks (1992) finds evidence which suggests that children who received nursery education performed better in English and Mathematics than those who had not. More recently, Daniels *et al* (1995), in an examination of the impact of pre-school education on achievement in

primary schools, find evidence which suggests a positive affect. Controlling for age and social background, children who had received pre-school education performed better than those who had not. The value of nursery education in producing such benefits is well documented (eg.Blackstone 1970, David 1990). Despite this, as shown in Chapter three of this study, not all children in England and Wales have access to nursery education.

The issue of need has received a great deal of attention in social policy. Powell (1987:26) argues "there is much confusion and controversy over the characterisation of need". Powell (1987) highlights the different ways in which the concept of need is used in academic literature. For example, need is discussed in terms of "human needs, basic needs, true needs, false needs, spiritual needs, material needs, and unconscious needs". In addition, need is contrasted with "wants, desires and luxuries", for example. Bennett (1982:133) argues that whilst "it is fairly easy to define the services for which need is assessed" it is "difficult to assess what constitutes need within any particular service category". Much of the complexity is due to the fact that the measurement of need "is not amenable to solutions that offer unquestionable absolute indicators" (Bennett and Krebs 1993:56).

Service need can broadly defined in four ways: normative, felt, expressed and comparative (Bradshaw 1972). Normative need is based on judgments made by experts such as professionals. An individual is said to be in normative need if their situation falls into a category of need identified by an expert. Thus the identification of need is external to the individual. Hardy (1981) argues that minimum standards within services are based on normative definitions of need. The external determination of normative need can be compared with Bradshaw's second category of need, felt need. This category of need may be equated with wants. Felt need "is

usually assessed by asking relevant members of the population if they feel that they need a particular service" (Clayton 1983:219). This is more difficult to identify in education than in other services since the consumer of the service may not be the individual who is making the decisions on its consumption. In education, particularly at nursery and primary levels, it is the normally a child's parents who makes these decisions. Felt need which is communicated to those within the policy system represents the third category of need - expressed need. Parents have the formal channels of the Governing Body and the Parent Teacher Association in schools through which they can express their children's needs. The Education Reform Act 1988, which has facilitated consumer choice and encouraged parental participation in the education of children, is likely to have increased the expression of need in education. Bradshaw (1972:73) argues that "expressed need or demand is felt need turned into action". Comparative need exists when one individual does not receive a service which another individual in similar circumstances receives. With respect to education, individuals can be said to be in comparative need if at a given stage of their education they do not have the opportunity to obtain the same teaching as other individuals in similar circumstances.

In applying Bradshaw's definitions of need to nursery education, the use of both felt and expressed need as practical indicators of the need for nursery education are problematic. Children under five neither feel the need, nor have the ability to express the need, for nursery education. The consumer of the service is therefore reliant on another individual (eg. parents) to feel and express the need for the service on their behalf. The extent of parental demand for the service is therefore largely dependent on the parent's views of the need for, and value of, nursery education (Osborn and Milbank 1987). Expressed need may also be influenced by parental perceptions about

the availability of services. Parents may feel that there is little point in expressing their needs if services are unlikely to be provided.

Felt and expressed need may also be deemed to have a limited application in the identification of need in nursery education on the grounds that both of these types of need are concerned with wants, rather than needs. Felt need may be equated with want (Hardy 1981). On this basis "it would be absurd to argue that the social services exist to satisfy people's wants and desires, and in arguing that they exist to satisfy needs, there is a presumed contrast operating between wants and needs...Needs and their satisfaction characterise the social services on the general welfare aspect of society: the market exists to satisfy preferences and wants" (Plant *et al* 1980:22). Felt need is therefore not relevant in the identification of need in nursery education. Powell (1987:31) argues that expressed need is a sub-set of felt need. This is because individuals who express their needs, and demand services in the welfare market, are those who have had the capacity to "overcome travel and time costs to demand the service". These individuals may not be representative of all those in need of welfare services. Percy-Smith (1992) also suggests that expressed need is a sub-category of felt need. To allocate nursery education services to those who express their needs would ignore the needs of those who, for whatever reason, failed to express their needs. Neither felt nor expressed need is appropriate in nursery education.

As nursery education is a non-compulsory service, the recognition by policy makers of need is clearly not as strong as the need for compulsory services, for example, primary education. However, the limited scope of existing nursery provision in England and Wales may not be a reflection that normative need does not exist, but rather that it is not responded to. This may be because of the high costs of providing nursery

education. There may also be a reluctance on behalf of the state to intervene in an area which it has never taken statutory responsibility for.

All children aged three and four may be considered to have normative need for nursery education. An acceptance that all children are in normative need does not mean that education prior to the age of five has to be made compulsory. Nursery education may be provided for the children of parents who wish to avail of it. Some parents may decide that their children can acquire the skills normally associated with nursery education in the home environment. The Labour party and the TUC in a joint report (Labour Party and the TUC 1926:12) provides early support for this approach in pre-school education "while we do not think it desirable that parents should be compelled to send little children under five to school, we take the view that mothers who wish to do so should be given this opportunity". More recently, the Education Select Committee of the House of Commons argued that "education for the under fives can not only enrich the child's life at the time but can also prepare the child for the whole process of schooling...there should be a steady expansion until all 3 and 4 year olds have access to places" (Education, Science and Arts Committee 1988 para. 9.5). The current proposal to introduce a voucher in nursery education for the parents of all four year olds is, in this respect, a recognition of the normative need of four year olds. Whilst parents may use the voucher to purchase a nursery place for their child, they are not compelled to do so (parents who decide to 'educate' their under five at home do not, however, receive the voucher [9]). By providing the voucher to all parents of four year olds who wish to 'purchase' nursery education, the needs of all children for nursery education are being officially recognised.

[9] The provision of a voucher to only those parents who take-up nursery services outside the home setting has created the potential for a black market to develop (Audit Commission 1996).

With respect to Bradshaw's comparative definition of need, a child of nursery age can be said to be in need if they do not receive the level of nursery education provision which another child, in similar circumstances, receives. In order then to identify those who are in need, the nature of these circumstances must be considered (Clayton 1983). Two approaches are relevant. In the first, the need for nursery education may be defined in terms of those children living in disadvantaged circumstances. The rationale supporting this approach is that children who live in disadvantaged circumstances have a greater level of need for the service than other children. Woodhead (1976:10), for example, argues that some children who "constantly appear to be of lower ability than is normal for their age" can benefit from nursery provision. Woodhead's central approach is that nursery education "provided selectively for these children could 'compensate' for their adverse home circumstances and render them more equal with their peers when they commence compulsory schooling".

The second approach to comparative need is one which recognises that all children aged three and four need nursery education, but that some children have a higher level of need than others (ACC/AMA 1977). The House of Commons Select Committee Report (Education, Science and Arts Committee 1988) supported this approach. In its conclusion the report commented that good quality pre-school education is of benefit to all children, but particularly those from socially or economically deprived backgrounds and whose first language is not English. On the basis of this approach, the need for nursery education may be defined as the number of children aged three and four with a weighting attached to groups within the client population to reflect the level of disadvantage which certain children experience.

This examination of the application of normative and comparative need in nursery education leads to the development of three approaches to the definition of the need for nursery education:

(a) all children of nursery age (normally deemed to be those children aged three and four) are in equal need of nursery education;

(b) only those children of nursery age in disadvantaged circumstances are in need of nursery education;

(c) all children of nursery age are in need of nursery education, and children who are disadvantaged have a greater level of need;

These approaches will be evaluated in the context of the dimensions of need considered in the next section.

II: Measuring the Need for Nursery Education

A. Conceptual Issues

This section of the Chapter is concerned with the conceptual issues surrounding the measurement of nursery educational need. A number of indicators of the need for nursery education are developed.

As identified in Chapter two, the concept of need has three dimensions: breadth, depth and total. In relation to nursery education, breadth of need refers to the number or proportion of children in need. Depth of need concerns the intensity of their need. Total need combines both of these dimensions and relates to the number of individuals in need multiplied by the intensity of their need. In an assessment of territorial justice, indicators of need should be classified into the appropriate dimension of need.

Taking the first approach to identifying the need for nursery education, need is defined in terms of all children aged three and four. This approach provides a breadth measure of need and is valuable in that it recognises the needs of all children for nursery education. The measure, however, assumes that all children have the same level of need for nursery education and that formal nursery education is the only service that can fulfill this need. Thus the educational contribution that some homes provide for children is not acknowledged (Plowden 1967). Whilst the measure therefore includes children who live in homes which facilitate the acquisition of essential skills, the merit of this first approach to the measurement of need is that it focuses on the breadth of need.

The second approach represents a measure of the depth of nursery educational need. Those identified as disadvantaged are considered to be in need of nursery education. Although the measure recognises the particular needs of children who are disadvantaged, it assumes that only those identified as disadvantaged are in need. This criticism of a selective approach to the definition of need represents one of the problems of the positive discrimination policy recommended by the Plowden Committee (Gray 1975). The assumption that educational and social disadvantage were exclusively contained within Educational Priority Areas clearly excluded those disadvantaged children who lived outside these areas, and included children within the Priority Area who may not have been disadvantaged. A further difficulty with this approach is that access to nursery services is restricted to the disadvantaged, thus possibly reinforcing existing inequalities experienced. The service provided is in danger of "segregating and hence stigmatising children from the neediest families" (National Commission on Education 1993:120).

The third approach to the identification of need in nursery education reflects elements of both normative and comparative need. It recognises that nursery education is beneficial for all children aged three and four, whilst acknowledging that some children can be identified as being in greater need than others. The DES (1973:3), in recommending the expansion of nursery provision for all children, argued that "nursery education is particularly valuable as a means of reducing the educational and social disadvantages suffered by children from homes which are culturally and economically deprived".

Each of these approaches is considered relevant in the identification of nursery educational need. In the first approach, need is identified in terms of all children of nursery age. In the second, only those children who are disadvantaged are in need of nursery education. In the final approach, all children are considered to be in need of nursery education, with those who are disadvantaged having the greatest depth of need. Since two of these approaches contain an element which reflects the level of disadvantage, the identification and accurate measurement of disadvantage is central to the measurement of the depth of need for education. Tizard *et al* (1976) argue that disadvantage has three components: social, educational and intellectual. In combination, these elements of disadvantage represent a deficient background which results in children performing badly at school. Thus it can be argued that children who live in a disadvantaged environment have an additional need for nursery education above that of other children.

A number of indicators have been used in the measurement of disadvantage in previous studies within education (Wedge and Prosser 1973, Mortimore and Blackstone 1982). For the purpose of measuring the need for nursery education in this Chapter, it is necessary to identify those indicators which are most closely

associated with disadvantage in nursery education. Previous theoretical and empirical studies in education have highlighted the following indicators:

Social Class IV and V

This is used by many authors as an indicator of disadvantage in their studies of the need for nursery education and pre-school provision (Blackstone 1971, Shinman 1981). Low social class is associated with a life-style and values which may not be conducive to the ability to make social progress in terms of education. Kumar (1993:148) argues that social class is "a proxy for a range of material and social disadvantages which impinge directly or indirectly on a child's educational progress". The influence of social class on educational opportunity and attainment has received a great deal of attention within education (Floud *et al* 1956, Halsey 1979, Smithers and Robinson 1991).

Lone Parent Families

It is argued that children from lone parent families are disadvantaged when compared with children from two parent families (Tizard *et al* 1976, Wedge and Prosser 1973, Mortimore and Blackstone 1982, Halsey 1991). Children in families headed by a single parent suffer the absence of a parent who might offer a child support in terms of social development (Essen and Wedge 1982). The level of need of children from lone parent families is therefore higher than that of children living in two-parent households (Education, Science and Arts Committee 1988).

Large Families

It can be argued that children who live in families where there is a large number of children "are more likely to have less help or attention from adults" (Wedge and Prosser 1973:11). Kellmer Pringle's (1977) view is that these children tend to be

relatively under-privileged in comparison with children living in families with fewer children. Dale (1995:10) argues that "given a fixed pool of resources (which include time and money) within the family, more resources are available per child if family size is smaller".

Housing Conditions

Certain housing conditions are also identified as being indicators of disadvantage (Wedge and Prosser 1973, Blackstone 1971). Overcrowded housing facilities, it is argued, are not conducive to good family relations, the provision of adequate space for learning, or the level of attention which young children require for development. On this basis therefore, variables which measure physical housing conditions represent a legitimate indicator of disadvantage.

Level of Income

Income strongly influences an individual's standard of living. Where it is low, a household may not be in a position to purchase goods and services other than those which are considered essential, eg. food, clothing and shelter. As argued by Kumar (1993:145) "low income means parents have less money to spend on books, educational toys, extra-curricular activities, or outings to museums, art galleries whether organised by the school or at home". Similarly, Hillman (1996:3) argues that "poverty, resulting from unemployment or low incomes, results in stress; and reduces or precludes money being spent by families on learning resources or learning opportunities". A household restricted to the purchase of only essential items would be disadvantaged in comparison with other households (Wedge and Prosser 1973, Pinch 1984).

Children from a Non-English Speaking Background

Nursery education, according to nursery education teachers, is considered desirable and essential for this client group (Taylor *et al* 1972). This may be due to the particular social disadvantage which results from this group's lack of English language development in comparison with other children of the same age (Curtis and Bebbington 1980). Since English represents the medium through which the vast majority of pupils receive formal education, those individuals who come from a background in which a language other than English is spoken, are at an clear disadvantage. Therefore, early education in the form of nursery schooling may assist in introducing elements of this group of young children to the English language before compulsory education.

The measures which are considered valid in relation to an assessment of the level of need for nursery education are Social Classes IV and V, single parent families, large families, poor housing conditions, low income and children from a non-English speaking background. Children under five in these circumstances are deemed to have an additional need for nursery education. Of these measures, poor housing conditions, low income and children from a non-English speaking background provide direct indicators of deprivation according to Thornhurst's (1985) classifications. Social Classes IV and V, single parent families and large families represent indirect indicators because additional need is inferred from these situations. Clearly all children in single parent families, for example, may not have an additional need for nursery education above that of other children. However, in general, these measures provide an indication of situations which are likely to lead to additional need. In the construction of a measure of need, local authority areas with high proportions of children within these categories have the greatest depth of need for nursery education.

In measuring the depth of need, these measures will be used separately and together in an index of the depth of need. Both of these approaches were considered appropriate in the assessment of the depth of need for nursery education. The use of the indicators separately is fitting because of their individual association with need in nursery education. Used together in an index of the depth of need, the multi-faceted nature of disadvantage will be encompassed. As reported by Tizard *et al* (1988:9) "the level of unemployment amongst black workers is higher, incomes of employed workers are lower and the housing allocated to black families is of poorer quality". Similarly in Bone's (1977:57) survey of pre-school children and the need for day-care, she reported that need is "concentrated in Social Classes IV and V, in families with more than three children and where there were more than two under five". The index of need for nursery education is likely to reflect these multiple need characteristics.

Similar indexes of need and disadvantage have been used in previous studies, mainly within the area of health. In education, the Plowden Report (1967) identified a variety of indicators of educational need which might be used to channel extra resources to educational priority areas. Whilst the indicators were not formed into an index, the selection of the measures does inform the identification of disadvantage in education. The formula used to calculate the level of central government grants to local authorities in England, may also be included in this discussion of indexes of need. A number of indexes are presented in Table 4.1 to illustrate the similarity between the index developed in this Chapter with established indexes. On the basis of the Jarman index of deprivation (1983), GPs in England and Wales, since 1990, receive an additional payment for each patient resident in a Census ward identified as 'deprived' (Senior 1991). Townsend *et al* (1988), critical of the Jarman index and the index of deprivation developed by the Department of the Environment (1983),

also developed an index of deprivation of health. Unlike both the Jarman and the Department of the Environment indexes, Townsend *et al's* index is more focused around the assessment of material deprivation, such as the proportion of households who own their homes and their cars, for example. Townsend *et al* (1988:34) argue that this approach is more appropriate because "too often there may have been a tendency to 'trawl' for possible measures without enough regard being paid to the overall sociological rationale for the selection" of particular indicators. In their analysis of a number of health indexes Morris and Carstairs (1991) support the Townsend index of material deprivation. In the index of need which has been developed in this Chapter, the variables which have been included are similar to five of the eight indicators included in the Jarman index. These are children under five, single parent households, overcrowded housing, ethnic residents and unskilled workers. The three indicators within the Jarman index which have not been included in the index above are elderly pensioners living alone, individuals changing address in one year and unemployed persons. These first two of these indicators are excluded on the basis that they are not relevant to need in nursery education. Unemployed individuals have also been excluded for the two reasons discussed below. Three of the six indicators of need included in the Department of the Environment 1981 index are included in the index in this study. The indicators which are excluded in this study are elderly pensioners living alone, households lacking amenities and unemployed persons. Elderly pensioners is excluded because of its lack of relevance to need in nursery education. Households lacking amenities is also excluded as the index of the need for nursery education includes overcrowded housing. The Department of the Environment (1981, 1991) are the only indexes to include both of these indicators of housing. The 1991 index is very different from the 1981 index in that there is a much greater emphasis on children in disadvantaged circumstances. In addition, the 1991 index includes variables from sources other than the Census of population. In relation

to the Townsend index, two of the variables are included in the index of need for nursery education. The indicators which have not been included are households which are not owner occupied and unemployed. Owner occupation has not been included in the index of educational need developed in this study because the index already incorporates an aspect of housing. Of the eight indicators of educational disadvantage identified by Plowden (1967), five of these have been incorporated into the index of disadvantage in this Chapter. Two of the variables which have not been included refer more specifically to need within primary and secondary education rather than nursery education (attendance records, children with special needs). Unemployed is also excluded from the index of nursery educational need. Of the six indicators included formula used to calculate the block grant allocations from central government to local authorities in England 1988-1989, five are included in the index of nursery education in this Chapter. In the current funding system, there are only three indicators. These are children of lone parents, children of claimants and children in ethnic households. Two of these are included in the index of need for nursery education. Children of claimants has been excluded.

Table 4.1: Components of Deprivation Indexes

	Jarman (1983,1984)	DoE (1981)	DoE (1991)**1	Townsend *et al* (1988)	Plowden (1967) 2	Block Grant Indicators (1988-1989) 3	SSA Assessments (1990) 4	Index of Need for Nursery Education
1. Elderly (pensioner) living alone	yes	yes	no	no	no	no	no	no
2. Children aged under 5	yes	no	no	no	no	no	no	no*
3. Single-parent households	yes	yes	no	no	yes	yes	yes	yes
4. People with unskilled occupations	yes	no	no	yes	yes	yes	no	yes
5. Unemployed persons	yes	yes	yes	yes	yes	yes***	yes***	no
6. People in overcrowded households	yes	yes	yes	yes	yes	yes	no	yes
7. People changing address in one year	yes	no	no	no	no	no	no	no
8. Ethnic minorities (ie. residents born in the New Commonwealth or Pakistan)	yes	yes	no	no	yes	yes	yes	yes
9. Households lacking basic amenities (ie. not exclusive use of bath and inside wc)	no	yes	yes	no	no	no	no	no
10. Households with no car	no	no	yes	yes	no	no	no	yes
11. Households not owner-occupiers	no	no	no	yes	no	no	no	no
12. Large Families	no	no	no	no	yes	yes	no	yes
13. Attendance records/truancy	no	no	no	no	yes	no	no	no
14. Children with special needs	no	no	no	no	yes	no	no	no
15. Children in low earner households	no	no	yes	no	no	no	no	no
16. Children in unsuitable accommodation	no	no	yes	no	no	no	no	no

Notes * Children under five, although not contained within the index of disadvantage developed, are contained within the measure of total need (NEEDS)

** The Department of Environment 1991 index also includes a range of other indicators eg. standard mortality rates, household insurance ratings and derelict land, for example.

*** Actual indicator is 'children of claimants. This factor is classified above as 'unemployed persons'.

Source: adapted from Senior M.L. 1991. 'Deprivation Payments to GPs: Not What the Doctor Ordered' *Environment and Planning C: Government and Policy* 9 p.80.

Additional Sources:

1. Department of the Environment. 1995. *1991 Deprivation Index: A Review of Approaches and a Matrix of Results* London: Department of the Environment.

2. Central Advisory Council for Education England, Plowden Report. 1967. *Children and Their Primary Schools*. Vols. 1& 2. London: HMSO.

3. Society of County Treasurers in Association with Society of Metropolitan Treasurers & Association of District Council Treasurers 1988-1989. *Block Grant Indicators*. London: Society of County Treasurers in Association with Society of Metropolitan Treasurers & Association of District Council Treasurers.

4. Department of the Environment. 1990. *Standard Spending Assessments. Background and Underlying Methodology*. London: Department of the Environment Local Government Finance Policy Directorate.

Within the indexes presented in Table 4.1, unemployed is used as a proxy indicator for low income. This variable is included in all of the indexes with the exception of the index developed in this Chapter. No car is also indicative of low income and, with the exception of Townsend *et al* (1988) and the Department of the Environment (1991), indexes contain either unemployed persons or no car to represent low income. The index in this Chapter adopts no car rather than unemployed persons as a proxy measure of low income. There are two reasons for this. The first of these relates to the availability of data. This issue is examined further below when the data is discussed. The second reason is that no car may provide a more appropriate indicator of low income than unemployed since unemployed only includes those individuals who are registered unemployed. Individuals who earn a low income are therefore excluded from this indicator. On this basis, no car may be more closely associated with low income than unemployed.

The index of disadvantage which has been developed in this study has been derived from the literature on the need for nursery education and the literature on indexes of deprivation. The index builds on the indexes of need and deprivation used in other areas of public policy in terms of its specific relevance to need and disadvantage in nursery education.

This section has examined three approaches to the identification of need in nursery education. In the first, all children of nursery age are considered to be in need of nursery education. In the second, only those children who are disadvantaged are in need. In the third, all children of nursery age are identified as being in need, with those children who are disadvantaged in the greatest need. In the latter two approaches, the accurate assessment of disadvantage is central to the measurement of educational need. This section has identified appropriate measures of disadvantage in

nursery education. These measures will be used separately and will be combined to form an index of the depth of need. The next section moves on to identify appropriate indicators of need in nursery education.

B. Indicators of Nursery Education Need

This section of the Chapter develops indicators of the need for nursery education based on the approaches to defining need discussed above. Indicators of need are presented in Table 4.2. The indicators fall into the three categories: breadth, depth and total need. The child population aged 3-4 per 1,000 of the population (CTP) represents a measure of the breadth of need. This measure identifies the need for nursery education on the basis of the first approach - all children are in equal need of nursery education. The greater the number of three and four year olds per 1,000 of the population in an area, the greater the breadth of need for nursery education.

Table 4.2: Measures of Need in Nursery Education

Measure	Indicator	Label	Dimension	Source
BREADTH OF NEED:				
3 & 4 year olds	3 & 4 year olds per 1,000 population 1981-1994	CTP	Breadth	1&2
DEPTH OF NEED 1981:				
Social Class IV & V	% of all households with children aged under 16 years where head of household is in Social Classes IV & V 1981	CLASS	Depth	3
Lone Parent Families	% of households with children aged 0-4 years which are headed by a lone adult 1981	NLONE	Depth	3
Large Families	% of households with children aged 0-4 years which have 2 or more dependent children 1981	NLGE	Depth	3
Housing Conditions	% of children aged 0-4 years in households with one or more persons per room 1981	NPPR	Depth	3
Low Income	% of children aged 0-4 who are in households which have no car 1981	NNCAR	Depth	3
Non-English Speaking Children	% of children aged 0-4 years where household head is born in New Commonwealth 1981	NNCW	Depth	3

DEPTH OF NEED 1991:

Social Class IV & V	% of economically active household heads in Social Classes IV and V with children aged 0-15 years 1991	CLASS	Depth	4
Lone Parent Families	% of households with children aged 0-4 years which are headed by a lone parent 1991	NLONE	Depth	4
Large Families	% of households with children aged 0-4 years which have 2 or more dependent children 1991	NLGE	Depth	4
Housing Conditions	% of households with children aged 0-4 years with one or more persons per room 1991	NPPR	Depth	4
Low Income	% of households with children aged 0-4 years which have no car 1991	NNCAR	Depth	4
Non-English Speaking Children	% of all households with children aged 0-4 years where head is born in New Commonwealth 1991	NNCW	Depth	4

Measure	Indicator	Label	Dimension	Source
TOTAL NEED 1981-1990				
3 & 4 year olds	3 & 4 year olds per 1,000 of the population 1981-1990 multiplied by the sum of the following:	NEEDS 1981-1990	Total	1&2
Social Class IV & V	% of all households with children aged under 16 years where head of household is in Social Classes IV & V 1981	CLASS	Depth	3
Lone Parent Families	% of households with children aged 0-4 years which are headed by a lone adult 1981	NLONE	Depth	3
Large Families	% of households with children aged 0-4 years which have 2 or more dependent children 1981	NLGE	Depth	3
Housing Conditions	% of children aged 0-4 years in households with one or more persons per room 1981	NPPR	Depth	3
Low Income	% of children aged 0-4 who are in households which have no car 1981	NNCAR	Depth	3
Non-English Speaking Children	% of children aged 0-4 years where household head is born in New Commonwealth 1981	NNCW	Depth	3

Note: The Depth of Need between 1981-1990 also incorporates the 1991 depth of need measures as indicated later in the Chapter. The 1991 indicators are those presented above 1991-1994.

TOTAL NEED 1991-1994

3 & 4 year olds	3 & 4 year olds per 1,000 of the population 1991-1994 multiplied by the sum of the following:	NEEDS 1991-1994	Total	1&2
Social Class IV & V	% of economically active heads of household in Social Classes IV and V with children aged 0-15 years 1991	CLASS	Depth	4
Lone Parent Families	% of households with children aged 0-4 years which are headed by a lone parent 1991	NLONE	Depth	4
Large Families	% of all households with children aged 0-4 years which have 2 or more dependent children 1991	NLGE	Depth	4
Housing Conditions	% of all households with children aged 0-4 years with one or more persons per room 1991	NPPR	Depth	4
Low Income	% of households with children aged 0-4 years which have no car 1991	NNCAR	Depth	4
Non-English Speaking Children	% of all households with children aged 0-4 years where head is born in New Commonwealth 1991	NNCW	Depth	4

Sources:

1. Department of Education and Science. 1981-1994 Statistical Bulletin. *Pupils Under Five Years of Age in Schools in England.* (January of each year) (London: Government Statistical Service)
2. Welsh Office. 1989-1994. *Statistics of Education and Training in Wales Schools.* (Welsh Office: HMSO)
3. OPCS. 1981. *1981 Census of Population* County Reports for all Local Authorities included in this study.
4. OPCS. 1991. *1991 Census of Population.* Crown Copyright. ESRC purchase

The second approach to the identification of need in nursery education identified above is one which is based on the depth of need. Children in disadvantaged circumstances have the greatest depth of need. The third approach encompasses both the breadth and the depth of need and represents a measure of the total need for nursery education. The inclusion of disadvantage is central in both of these approaches. As identified above, disadvantage in nursery education can be assessed on the basis of Social Class IV and V, lone parent families, large families, household conditions, low income and children from a non-English speaking background. Children aged 3 and 4 living in these circumstances have the greatest depth of need for nursery education. In the measurement of depth of need, it is necessary to identify appropriate indicators of each of these situations.

A range of indicators of the depth of need are presented in Table 4.2. These indicators have been obtained from the 1981 and 1991 Census of Population data. These indicators provide the closest operationalisation of the depth of need for nursery education that data sources permit (this issue is examined on p.184 below). These indicators are: CLASS provides a measure of the % of all households/household heads with children where the head of household is in Social Classes IV and V; NLONE represents a measure of lone parent households with children; NLGE provides a measure of households with large families; NPPR reflects children/households with children living in overcrowded housing; NNCAR represents a measure of the % of children/households with children which have no car; and NNCW represents a measure of the proportion of children/households with children from ethnic backgrounds. These depth of need measures represent the second approach to the measurement of nursery educational need - only those children who are disadvantaged are in need. The indicators will also be incorporated into the

measurement of total need which is the third approach to the identification of need in nursery education. Each indicator measures the proportion of the population aged 0-4 years or 0-15 years which is in particular need circumstances. Ideally, these measures would relate more specifically to children aged 3 and 4, rather than either the child population aged 0-4 or 0-15 years. However, data at this level is not available. Thus, the child population aged 0-4 years and 0-15 years is as specific a measure of the need for nursery education as data sources permit.

In selecting the indicators of the depth of need, the circumstances which have been identified above have been included. Social Class is represented by the indicator CLASS; lone parent families by NLONE; large families by NLGE; housing conditions by NPPR; low income by NNCAR; and children from a non-English speaking background by NNCW.

The indicators of the depth of need for nursery education have been obtained from Census sources in 1981 and 1991. Two of the six indicators are directly comparable in 1981 and 1991. These are: NLONE and NLGE. These variables represent measures of the % of households with children 0-4 years who are lone parents (NLONE) and those who have large families (NLGE). The indicators for each of the other measures differ between 1981 and 1991. In relation to CLASS, the 1981 indicator represents a measure of the proportion of all households with children under 16 whose head is in Social Classes IV and V. The 1991 measure is focused on the % of economically active household heads with children aged under 16 years who are in Social Classes IV and V. The difference between 1981 and 1991 is that the 1981 indicator calculates households with children under 16 which are headed by Social Classes IV and V as a proportion of all households with children under 16, whereas the 1991 indicator represents a measure of the % economically active household

heads in Social Classes IV and V with children under 16 as a proportion of all economically active household heads with children with children under 16. The 1981 indicator is wider than the 1991 measure. This is because the 1981 indicator includes all households headed by Social Classes IV and V with children, whether the head is active or not. Since CLASS has been included to represent a measure of Social Classes IV and V with children, the 1981 indicator is more appropriate than the 1991 measure. However, 1991 data which is comparable with 1981 is not available. The 1991 data on Social Classes IV and V with children is only available for economically active heads of household and not for economically inactive with children. It is not appropriate to assume that those who are economically inactive with children are all in Social Classes IV and V since the inactive population can be in any of five Social Classes. On this basis, the 1981 and 1991 indicators of Social Classes IV and V with children (CLASS) adopted in this study lack direct comparability.

In relation to housing conditions, in 1981 overcrowding is represented by the % of children aged 0-4 years in households with one or more persons per room; in 1991, housing is measured on the basis of the % of households with children aged 0-4 years with over one person per room. These indicators differ in the following respect: in 1981 overcrowded housing is calculated as children aged 0-4 years in overcrowded households as a proportion of all children aged 0-4 years; in 1991, the figure is calculated on the basis of overcrowded households with children aged 0-4 as in as a proportion of all households with children aged 0-4 years. Both of these indicators are appropriate in the measurement of overcrowded housing conditions.

Low income is represented by the proxy indicator NNCAR. In 1981, NNCAR is calculated as the proportion of children aged 0-4 years who live in households without a car. In 1991, NNCAR represents a measure of the proportion of households with

children aged 0-4 years which have no car. Both of these indicators represent equally valid measures of children and households without a car. The issue about whether NNCAR represents an appropriate proxy for low income is appraised below when the data is discussed.

Finally, the indicator NNCW differs between 1981 and 1991. In 1981, the indicator relates to the proportion of children aged 0-4 years where the head of household is born in the New Commonwealth. The 1991 measure is the proportion of households with children aged 0-4 years where the head of household is born in the New Commonwealth. Both of these indicators represent valid measures of children and households with children from non-English speaking backgrounds.

The 1981 and 1991 indicators of the depth of need are broadly comparable with each other. Whilst some of the indicators relate to households with children, others refer to the proportion of children. The 1981 and 1991 indicators measure similar depth of need circumstances. In order to determine the stability in the depth of need over time, the 1981 and 1991 indicators can be correlated with each other. These correlations, presented in Table 4.3, show that the relationship between all of the indicators in 1981 and 1991 is close. Thus the depth of need for nursery education is stable over time. The highest correlation (.9831***) is between NNCAR in 1981 and 1991. This correlation is high despite the different measurement of NNCAR in 1981 and 1991. The correlation between children in ethnic households (.8499***) in 1981 and 1991 is also high. Whilst the indicator of Social Classes IV and V differs between 1981 and 1991, the correlation between CLASS in 1981 and 1991 is .8742***. This means that, although a slightly different indicator is used to represent Social Classes IV and V in both years, the relationship is close. The correlation between NPPR in 1981 and 1991 weaker than that relating to other indicators. This suggests that overcrowding

changed between 1981 and 1991. This finding is supported by figures from the OPCS which suggest that the proportion of overcrowded households fell nationally between 1981 and 1991 (Dale 1996). Overall, the indicators of the depth of need in 1981 are positively correlated with the comparable measures in 1991. Areas which had a high depth of need in 1981 were also high in 1991.

Table 4.3: The Correlation Between Depth of Need Indicators 1981 and 1991

	CLASS91	NLONE91	NLGE91	NPPR91	NNCAR91	NNCW91
CLASS81	.8742***					
NLONE81		.8394***				
NLGE81			.7712***			
NPPR81				.6381***		
NNCAR81					.9831***	
NNCW81						.8499***

Key:

Significance levels:

* 0.05 or better
** 0.01 or better
*** 0.001 or better

Variables:

CLASS81	% of all households with children aged under 16 years where head of household is in Social Classes IV & V 1981
NLONE81	% of households with children aged 0-4 years which are headed by a lone adult 1981
NLGE81	% of households with children aged 0-4 years which have 2 or more dependent children 1981
NPPR81	% of children aged 0-4 years with one or more persons per room 1981
NNCAR81	% of children aged 0-4 who are in households which have no car 1981
NNCW81	% of children aged 0-4 years where household head is born in New Commonwealth 1981

***

CLASS91	% of economically active households with children aged 0-15 years where head of household is in Social Classes IV & V 1991
NLONE91	% of households with children aged 0-4 years which are headed by a lone parent 1991
NLGE91	% of households with children aged 0-4 years which have 2 or more dependent children 1991
NPPR91	% of households with children aged 0-4 years with over 1.5 persons per room 1991
NNCAR91	% of households with children aged 0-4 years with no car 1991
NNCW91	% of all households with children aged 0-4 years where head is born in New Commonwealth 1991

Depth of need for nursery education is represented by Social Classes IV and V, lone parent households, large families, overcrowded housing, low income and households with children from ethnic backgrounds. The correlation between these indicators in 1981 and 1991 will now be examined in order to determine whether there is stability in the relationships between the indicators of the depth of need over time. The correlation between the 1981 indicators is presented in Table 4.4 below. Whilst many of the indicators are significantly correlated with each other, only a few of the correlations are above .6000*** [10]. The correlations between Social Classes IV and V (CLASS81) and both and lone parents (NLONE81) and children in households with no car (NNCAR81) provide the strongest positive relationships. NNCAR81, with the exception of large households (NLGE81) and ethnic children (NNCW81), is positively associated with all of the indicators. The weakest relationships are those between ethnic population (NNCW81) and both Social Classes IV and V (CLASS81) and children in households without a car (NNCAR81). Negative correlations exist between large households (NLGE81) and Social Classes IV and V (CLASS81), lone parent households (NLONE81) and children in households with no car (NNCAR81). The positive correlation between children in households with no car and the other indicators is expected since, for example, those in Social Classes IV and V are likely to have a low income. Large families (NLGE81) is negatively correlated with all of the depth of need indicators.

[10] A correlation of .6000 and above is identified by Boyne and Powell (1991) as indicative of strong territorial justice. The Boyne and Powell (1991) framework is used in this context to identify a strong bi-variate relationship.

Table 4.4: The Correlation Between Depth of Need Indicators 1981

	CLASS81	NLONE81	NLGE81	NPPR81	NNCAR81	NNCW81
CLASS81	1.0000					
	***					
NLONE81	.5563	1.0000				
	***	***				
NLGE81	-.4365	-.4868	1.0000			
	***	***	***			
NPPR81	.5345	.7389	-.5032	1.0000		
	***	***	***	***		
NNCAR81	.8254	.6938	-.6541	.6140	1.0000	
		***	*	***		
NNCW81	.0948	.3842	-.2029	.6687	.0679	1.0000

KEY:

Significance levels:

* 0.05 or better
** 0.01 or better
*** 0.001 or better

Table 4.5 presents the correlation matrix for each of the depth of need indicators in 1991. The matrix is different from Table 4.4 in a number of key areas. Firstly, the strength of the correlations changes between 1981 and 1991. For example, the relationships between Social Classes IV and V and both households with no car and overcrowding and low income is weaker in 1991 than 1981. In the case of overcrowding and Social Classes IV and V, the correlation is not significant. In contrast, the correlations between the ethnic population and lone parents, overcrowded housing and no car are all stronger in 1991 than in 1981. Also, the correlation between households with no car and ethnic population is stronger in 1991. The stronger correlation between the indicators of the depth of need in 1991 suggests a greater concentration of need - areas which were high on the basis of one of the indicators also had high need in relation to other measures. Secondly, large families is more negatively correlated with each of the other indicators in 1991 than in 1981.

The strongest correlation in 1991 is between households with no car and lone parents (.8814***). In general, whilst the correlation between some of the indicators is stronger in 1991 and weaker, in the case of others, the relationship between the variables overall is not strong. On this basis, each indicator represents a distinctive element of need and, therefore, should be included in a measure of the need for nursery education.

Table 4.5: The Correlation Between Depth of Need Indicators 1991

	CLASS91	NLONE91	NLGE91	NPPR91	NNCAR91	NNCW91
CLASS91	1.0000					
	***					
NLONE91	.3348	1.0000				
	***	***				
NLGE91	-.5191	-.7710	1.0000			
		***	***			
NPPR91	.1594	.5104	-.5746	1.0000		
	***	***	***	***		
NNCAR91	.6273	.8814	-.8948	.5208	1.0000	
		***	***	***	***	
NNCW91	.0129	.4539	-.5569	.7383	.4182	1.0000

KEY:

Significance level:

*** 0.001 or better

Overall, the correlation between a number of the indicators of the depth of need is positive in 1981 and 1991. Low Social Class, for example, is associated with overcrowding, no car and lone parent households. Negative correlations exist between large households and both low Social Class and lone parent households. The depth of need, represented by large households, is not generally associated with other measures of the depth of need. Thus the inclusion of these households in the index represents a distinctive component of the depth need.

These indicators of the depth of need will be used separately and together in the assessment of the depth of need for nursery education. Together the indicators form an index of the depth of need for nursery education. Whilst the index provides a single indicator which reflects the multi-faceted nature of disadvantage, the problems associated with indexes must be recognised. The Plowden Report (1967) identifies three problems in the establishment of an index of educational need. Firstly, the actual criteria selected for the identification of disadvantaged areas is problematic since some criteria may be omitted, whilst others included in the measure. A second problem relates to the requirement to construct a measure which is relevant, quantifiable and where the data is readily available. Finally, the issue of scaling or weighting of the individual variables within the index must be considered. Each of these issues will now be considered in turn.

The selection of appropriate indicators of disadvantage represents the first consideration identified by the Plowden Report (1967). In the assessment of the depth of need in this Chapter, the indicators have been selected on the basis of the association with disadvantage in nursery education. Social Class, lone parent families, large families, housing conditions, low income and children from a non-English speaking background have all been associated with disadvantage in previous studies. In this study, an attempt has been made to include these indicators within the measurement of disadvantage in 1981 and 1991. Thus Social Classes IV and V are represented by the indicator CLASS, lone parent families by NLONE, large families by NLGE, housing conditions by NPPR, low income by the measure NNCAR and children from a non-English speaking background by the indicator NNCW.

The second issue raised by Plowden (1967) relates to the construction of a measure of need which is relevant and quantifiable. The process of obtaining a single measure of the depth of need in this study is as follows. Firstly, as all of the indicators of disadvantage are measured in percentage terms, the indicators were summed and divided by their number to obtain the average level of disadvantage. Secondly, these values were standardised so that the indicators which have the highest values are given the most weight. This approach, which summed the indicators first and standardised them second, allowed those indicators with the highest values to be given the greatest weight within the index. The index containing the 1981 Census indicators is represented by the label DISAD81 and the index for 1991 by NDS91. The z scores for both DISAD81 and NDS91 were made positive by adding the minimum z score for each variable, plus one to enable further calculations to be undertaken with these indicators.

The depth of need indicators from the 1981 and 1991 Census refer to these years only. Taking the construction of the depth of need index between 1981 and 1990, the approach which was initially adopted in this study was one in which DISAD81 would be used throughout the period. The limitation of this approach was that DISAD81 is likely to have become more irrelevant as the 1980s progressed. It assumes that the level of disadvantage in 1981 was appropriate to all of the years between 1981 and 1990. Only an annual measure of disadvantage would overcome this limitation. However, such data is not available. In its absence, an alternative strategy was employed which acknowledges the decreasing relevance of 1981 disadvantage data throughout the 1980s and the increasing significance of data relating to 1991.

The indicators of the depth of need in 1981 and 1991 are presented in Table 4.6 below:

Table 4.6: Indicators of the Depth of Need 1981 and 1991

Depth of Need 1981

DISAD81=(CLASS81 + NLONE81 + LGE81 + NPPR81 + NNCAR81 + NNCW81) / 6

where:

DISAD81	z score of the depth of need 1981 (all values made positive)
CLASS81	% of all households with children aged under 16 years where head of household is in Social Classes IV & V 1981
NLONE81	% of households with children aged 0-4 years which are headed by a lone adult 1981
NLGE81	% of households with children aged 0-4 years which have 2 or more dependent children 1981
NPPR81	% of children aged 0-4 years with one or more persons per room 1981
NNCAR81	% of children aged 0-4 who are in households which have no car 1981
NNCW81	% of children aged 0-4 years where household head is born in New Commonwealth

Depth of Need 1991

NDS91=(CLASS91 + NLONE91 + LGE91 + NPPR91 + NNCAR91 + NNCW91) / 6

where:

NDS91	z score of the depth of need 1991 (all values made positive)
CLASS91	% of economically active heads of household in Social Classes IV and V with children aged 0-15 years 1991
NLONE91	% of households with children aged 0-4 years which are headed by a lone parent 1991
NLGE91	% of households with children aged 0-4 years which have 2 or more dependent children 1991
NPPR91	% of households with children aged 0-4 years with one or more persons per room 1991
NNCAR91	% of households with children aged 0-4 years with no car 1991
NNCW91	% of all households with children aged 0-4 years where head is born in New Commonwealth 1991

To reflect the increasing relevance of the 1991 data during the 1980s, 1981 Census data (DISAD81) is given less weighting as the 1991 data (NDS91) is becoming more relevant. Table 4.7 presents the calculations relating to the construction of the depth of need index between 1981-1990 based on DISAD81 and NDS91. In 1981, disadvantage is calculated on the basis of the level of disadvantage in 1981 (DISAD81). In the period 1982-1990, the 1991 data (NDS91) is given more

weighting as the 1980s progress to reflect the increasing relevance of the level of disadvantage in 1991. Since the z scores of the indicators of the depth of need are used to calculate NDS81-90, the fact that some of the indicators are different in 1981 and 1991 is therefore accounted for. This approach to the measurement of the depth of need between 1981 and 1990 is valuable in its recognition of the changing depth of need between 1981 and 1991. Thus changes in overcrowding which took place between 1981 and 1991 are therefore reflected in the data.

Table 4.7: Calculating the Index of the Depth of Need 1981-1994

Disadvantage 1981-1994	Label Depth of Need*
DISAD81	=NDS81
.9(DISAD81)+.1 (DISAD91)	=NDS82
.8(DISAD81)+.2 (DISAD91)	=NDS83
.7(DISAD81)+.3 (DISAD91)	=NDS84
.6(DISAD81)+.4 (DISAD91)	=NDS85
.5(DISAD81)+.5 (DISAD91)	=NDS86
.4 (DISAD81)+.6 (DISAD91)	=NDS87
.3 (DISAD81)+.7 (DISAD91)	=NDS88
.2 (DISAD81)+.8 (DISAD91)	=NDS89
.1 (DISAD81)+.9 (DISAD91)	=NDS90
NDS91	=NDS91
NDS92	=NDS91
NDS93	=NDS91
NDS94	=NDS91

Note: * the z scores for ZDISAD81, ZNDS91 were made positive before any calculations were made NDS81-94.

The index of the depth of need in the 1991-1994 period is NDS91. In the obvious absence of Census data for 2001, this figure must be used to represent the depth of need in each of the years between 1991 and 1994 in this study. The assumption implied within this approach is that the level of disadvantage in 1991 remained constant across 1991-1994. The indicator NDS91-94 has been attached to each year to represent the depth of need between 1991-1994.

The final issue highlighted in the Plowden report (1967) concerns the weighting of variables within the index. Little and Mabey (1972:83) argue that "the basic problem is, of course, what weight should be given to each factor since almost certainly, all are not equal". There is considerable debate about whether indicators should be weighted or not within indexes of need. Carley (1981:93) highlights that, on the one hand, if variables are weighted, there is the possibility that the weights reflect the values of the researcher more closely than they do the individuals whose welfare is under consideration. On the other, if variables are not weighted, the importance attached to individual indicators may be lost. In addition, the decision not to weight particular variables "simply transfers the value-weighting to the choice of the indicators". In education, although there is a high level of consensus that disadvantage represents an additional need for education (Woodhead 1976, Mortimore and Blackstone 1982), few writers have addressed the relative contribution of specific components of disadvantage to the depth of need for education. Some of the previous studies which have included indexes of need have given each indicator of disadvantage an equal weighting (Little and Mabey 1972, Bebbington 1977, Curtis and Bebbington 1980, Townsend *et al* 1988, Department of Environment 1995). Others have weighted the variables, for example, Jarman (1983) and the Department of the Environment (1981). In the Department of the Environment 1981 index, unemployment received a double weighting as, it was argued, this was the only economic indicator in the index. In contrast, in the Department of the Environment 1991 index, none of the variables are weighted. A strong rationale is put for this approach: "this simple solution was not lightly decided upon. No academic argument could be advanced to weight any indicator more than any other" (Department of the Environment 1995). In the current system of allocating resources from central government to local authorities in Britain, a number

of indicators are weighted. Within the section of the Standard Spending assessments formula devoted to additional educational needs, the indicators relating to 'children of single parents' and 'children of claimants' are weighted by 1.5, whilst the indicator concerning children born outside the UK is not weighted. The rationale provided for this approach is that this "maintains a balance between factors measuring 'general' social disadvantage and the ethnic factor which measures more specific language and cultural difficulties" (Department of the Environment 1990:11). On the basis of this argument, should the indicators within the index of nursery educational need in this Chapter be similarly weighted? The research which has been discussed above supporting each of the measures within the index did not suggest that 'social disadvantage' indicators are more important in the need for nursery education than 'ethnic factors'. It is worth noting that in the previous block grant allocations 1988/89, children of ethnic population were weighted more heavily than other measures including housing conditions, single parents and large families (Society of County Treasurers 1989). Burgin (1982:52) argues that such weightings are "largely a matter of judgement - research indications are not precise". In view of the conflicting approaches to the weighting of need indicators and the lack of evidence and consensus amongst writers on the appropriate approach, the index of the depth of need in this Chapter is unweighted.

In addition to the index of the depth of need, these indicators are also used separately to measure the depth of need. As each of the indicators relate to 1981 and 1991, the approach used above to measure disadvantage in each year has been adopted. Thus from 1982 onwards, the 1991 data is progressively used in the measurement of the depth of need until 1990. In the period 1991-1994, the 1991 data is used. With the exception of NLONE and NLGE, all of the individual indicators were standardised

and the z scores made positive. NLONE and NLGE did not require standardisation because these indicators are the same in 1981 and 1991.

A measure of total need (NEEDS) has been developed for the period 1981-1994. This measure is based on the number of children per 1,000 of the population in an area (CTP) multiplied by the depth of need (NDS81-94) in an area. The measure represents the third approach to identifying need in nursery education in this Chapter - all children are in need, and those children who are disadvantaged have the greatest depth of need. The measurement of total need 1981-1994 is outlined in Table 4.8 below.

Table 4.8: Total Need for Nursery Education 1981-1994

TOTAL NEED (NEEDS) 1981-1994 =

ZCTP81-94 X ZNDS81-94

where:

NEEDS=index of need represented by children aged 3 and 4 per 1,000 population 1991-1994 times disadvantage 1981-1994

ZCTP81-94 = z score of the number of 3 and 4 year olds per 1,000 population 1990-1994

ZNDS81-1994=zscore of the depth of need (disadvantage)

Each of the two main variables (ZCTP 1990-1994 and ZNDS81-94) are weighted equally in the measure of total need (NEEDS81-94). Total need is the breadth of need (3 and 4 year olds per 1,000 total population) multiplied by its depth (the level of disadvantage) within an area.

In sum, the indicators of the need for nursery education adopted in this study are CTP 1981-1994 (breadth of need), the separate indicators of the depth of need CLASS81-94, NLONE81-94, NLGE81-94, NPPR81-94, NNCAR81-94, NNCW81-

94 together with the index of the depth of need (NDS81-94) and NEEDS81-94 (total need).

C. Data on the Need for Nursery Education

This section is concerned with the sources of data used in the measurement of the need for nursery education. Data relating to the breadth of need has been obtained from the Statistical Bulletins on Under Five Education, published by the Department for Education and Science for England and the Statistics for Education and Training in Wales. The Statistical Bulletin for Under Five Education provides annual information relating to the number of three and four year olds in England (1981-1994). The Welsh Office data refers to 1989-1994 (see p.113 above). Data on the depth of need for nursery education has been obtained from the Census of Population in 1981 and 1991. The individual County and District reports were used to access the 1981 data. These reports provided much more specific data relating to the circumstances of children than are contained in the Key Statistics for Local Authorities report (OPCS 1981). The 1991 data was gained through accessing the ESRC computer records of the 1991 Census held at the Manchester Computing Centre. This source also provided more specific data than the Key Statistics for Local Authorities (OPCS 1991). The use of the individual authority reports and the computerised records meant that information relating to the depth of need for nursery education was gained.

It is necessary to identify the limitations of the data. Firstly, the indicators of the depth dimension of need in this study rely on the data contained within the Census of population in 1981 and 1991. The central difficulty with Census indicators is that they refer to one year only. Their worth in the period immediately following the collection of the data is likely to be greater than in subsequent years since changes,

not reflected in the data, are likely to have occurred. This study has gone some way towards overcoming this difficulty by constructing a measure of the depth of need for 1981-1990 which incorporates the Census for 1981 and 1991. This approach cannot be applied in the period 1991-1994 for the obvious reason that the 2001 Census is currently not available. Thus the depth of need in 1991 is assumed to be the same between 1992-1994. Whilst this problem is recognised, it cannot be overcome due to the absence of an annual data source containing the information provided in the census.

Secondly, the Census of population indicators used in this study, whilst inclusive of the nursery population, are not specifically focused on 3 and 4 year olds as distinct from children under 4. In addition, the indicator Social Classes IV and V (CLASS) relates to children 0-15 years. This indicator is not available for the 3 and 4 year old population, nor for the 0-4 age group. The implication of adopting the 0-4 years category, and 0-15 years in the measurement of the depth of need is that the indicators are not as specific as one would wish them to be. However, the measures are inclusive of the 3 and 4 year old population. The 0-4 years indicators would only be inappropriate indicators of the depth of need for nursery education in a situation where the need circumstances of the 0-4 age group were not representative of 3 and 4 year olds. There is no evidence to indicate whether the depth of need of 3 and 4 year olds is different from that relating to children aged 1 and 2. The depth of need relating to children aged 0-4 years must therefore be adopted. Social Classes IV and V is calculated on the basis of the population 0-15 years. Although nursery age children are included in this indicator, the focus on the Social Class position of all children is not as specific to the 3 and 4 year olds as one would wish. Data sources do not permit a more appropriate operationalisation of 3 and 4 year olds where the

head of household is in Social Classes IV and V. In the absence of the data, this indicator, calculated for the whole of the child population, must be adopted.

Thirdly, no car has been adopted as a proxy measure of low income. As indicated above, this indicator has been included since there is no data available on the income of households with 3 and 4 year olds at the level of local authorities. Initially, unemployment was included as a proxy of low income. However, data on children in households where the head of household is unemployed is not available for the child population 0-4 years, or 0-15 years. Data on individuals and households unemployed is only available in relation to all households, regardless of whether or not they have children. The inclusion of this proxy measure of low income households in general was deemed inappropriate because of the lack of focus on nursery children, or indeed children of any age. An alternative measure is no car availability. Data on the availability of cars is specific to the child population aged 0-4 years. This indicator provides a more appropriate proxy measure of low income than unemployment for two reasons. The first of these is that unemployed households excludes those where the head of household is employed and earning a low income. Secondly, data on the indicator unemployment is not available for households with children.

A fourth limitation, identified by Norris (1979:22), is that "the uncritical use of a variety of indicators lends itself to situations where certain dimensions of the problem receive more attention than others merely by virtue of the greater availability of quantifiable data concerning the former". The measures of the depth of need in this study have been carefully selected on the basis of their association with need in nursery education. The circumstances which were identified above (Social Classes IV and V, lone parents, large families, poor housing, low income and ethnic households), have all been included in the measurement of the depth of nursery

educational need. These circumstances were identified in the literature as those which contribute to need in nursery education.

Fifthly, any study such as this is reliant on the collection of accurate data. Marsh (1993) raises three issues in relation to the quality of Census data. The first of these is that the information is provided by individuals themselves, who may not reflect their circumstances sufficiently or appropriately. Secondly, errors can occur in the transmission of Census data from the forms which have been completed by individuals on to other data sources. Thirdly, census data are subject to incomplete coverage. In the 1991 Census, it was reported that one million individuals in England and Wales were not included in the data count. Part of this under-count may have been associated with an unwillingness to register due to the community charge (Simpson and Dorling 1994). Whilst the Census figures which are made available by the OPCS (1991) have attempted to overcome each of these problems, these limitations must be recognised in a study such as this.

This study examines the need for nursery education between 1981 and 1994 in the Non-Metropolitan Counties, the Metropolitan Districts, the Inner and Outer London Boroughs and the Welsh Counties. In the period under review, the Welsh Counties are added into the analysis in 1989 and the Inner London Boroughs in 1991. This is because data relating to the number of three and four year olds in the Welsh Counties only became available in 1989. With the abolition of the ILEA in 1991, the Inner London authorities have been added in this year.

This section of the Chapter has been concerned with the measurement of need in nursery education. Three approaches to measuring need have been developed. These correspond to the three dimensions of need. In the first approach, children per 1,000

of the population provides a measure of the breadth of nursery educational need. The second represents a measure of the depth of need - children in disadvantaged circumstances. In the third approach, a composite measure of need has been developed which is based on the child population together with disadvantage. In the next part of the Chapter the extent of nursery educational need in England and Wales will be identified.

III. The Need for Nursery Education in England and Wales 1981-1994

A. Inter-Authority Variations

Tables 4.9 - 4.17 present the figures relating to the need for nursery education within local authority areas in England and Wales for the period 1981-1994. The Tables present the average level of need for all authorities, the coefficient of variation, the authorities with the lowest and highest level of need and the number of authorities included in the analysis. The figures for all authorities are examined together as this represents the approach to the examination of territorial justice in the next Chapter.

Table 4.9 presents the figures relating to the breadth of need indicator - children per 1,000 of the population (CTP). As indicated in the Table, the average number of children per 1,000 population across the period is between 22.95 and 27.09. In general, the average child population increased annually between 1981 and 1994. The coefficient of variation is relatively stable over time. There is an urban/rural separation between the authorities with the least children and those with the most. Those with the least children are, with the exception of Westminster, all rural authorities located in the South of England. The inclusion of the Inner London Boroughs into the analysis in 1991 changed this pattern with Westminster having the lowest child population. The authorities with the least need between 1981 and 1994 have a minimum of 16 three and four year olds per 1,000 of the population. In

contrast, the areas with the most children have between 28 and 36 children per 1,000 population (Knowsley, Bradford and Newham). All of these authorities are urban areas. The dissimilarity between the Inner London Boroughs of Westminster and Newham is apparent. In 1994, Newham had double the number of children per 1,000 of the population as Westminster. This highlights the variation in the breadth of need which exists within the London Boroughs.

Table 4.9: The Breadth of Need for Nursery Education (3 and 4 Year Olds per 1,000 of the Population) in England and Wales 1981-1994

Variable	Mean	CV	Minimum	Maximum	n
CTP81	22.95	8.84	16.9(East Sussex)	28.5(Knowsley)	95
CTP82	23.22	8.69	17.7(East Sussex)	28.1(Knowsley)	95
CTP83	24.48	8.49	18.7(East Sussex)	29.6(Knowsley)	95
CTP84	25.58	8.20	19.9(East Sussex)	31.4(Bradford)	95
CTP85	25.47	9.61	19.2(East Sussex)	33.3(Bradford)	95
CTP86	25.12	8.83	19.5(Isle of Wight)	31.5(Knowsley)	95
CTP87	25.18	10.4	19.0(Dorset)	33.5(Newham)	95
CTP88	25.32	8.96	19.6(Isle of Wight)	32.5(Newham)	95
CTP89	25.80	10.0	19.8(Isle of Wight)	35.9(Newham)	103
CTP90	26.19	9.11	19.8(Isle of Wight)	36.3(Newham)	103
CTP91	26.45	10.5	19.9(Westminster)	36.4(Newham)	115
CTP92	26.75	10.0	18.3(Westminster)	36.0(Newham)	115
CTP93	26.82	9.73	18.2(Westminster)	36.0(Newham)	115
CTP94	27.09	9.15	18.2(Westminster)	36.7(Newham)	115

Authorities:

n=95 (39 Non-Metropolitan Counties, 36 Metropolitan Districts, 20 Outer London Boroughs)

n=103 (39 Non-Metropolitan Counties, 36 Metropolitan Districts, 20 Outer London Boroughs, 8 Welsh Counties)

n=115 (39 Non-Metropolitan Counties, 36 Metropolitan Districts, 20 Outer London Boroughs, 8 Welsh Counties, 12 Inner London Boroughs)

Tables 4.10 - 4.15 present the data relating to each of the individual indicators of the depth of need. Table 4.10 presents Social Classes IV and V. As indicated in the Table, the average depth of need increased from 3.22 to 3.46 over the period. The London Boroughs of Richmond and Kingston have the least depth of need. Knowsley has the greatest depth of need between 1981 and 1987. During these years, the depth

of need in Knowsley fell from 6.10 in 1981 to 5.40 in 1987. Knowsley and Manchester have over 5 times the depth of need as Kingston and Richmond. The variation between authorities decreased until 1991. With the inclusion of the Inner London Boroughs in 1991, the level of variation increased. It is apparent from the authorities with the least and greatest depth of need that there is a divide between the sub-urban London Boroughs and the Metropolitan Districts of Knowsley and Manchester. Overall, whilst the average depth of need decreased over the period, there are sharp contrasts between the authorities with the least and those with the most need.

Table 4.10: The Depth of Need for Nursery Education (Social Classes IV and V*) in England and Wales 1981-1994

Variable	Mean	CV	Minimum	Maximum	n
CLASS81	3.22	31.0	1.00(Kingston)	6.10(Knowsley)	103
CLASS82	3.24	30.5	1.09(Kingston)	5.98(Knowsley)	103
CLASS83	3.27	29.6	1.08(Richmond)	5.87(Knowsley)	103
CLASS84	3.29	29.1	1.07(Richmond)	5.75(Knowsley)	103
CLASS85	3.31	29.0	1.06(Richmond)	5.63(Knowsley)	103
CLASS86	3.34	28.4	1.05(Richmond)	5.51(Knowsley)	103
CLASS87	3.36	28.2	1.04(Richmond)	5.40(Knowsley)	103
CLASS88	3.38	28.1	1.03(Richmond)	5.32(Manchester)	103
CLASS89	3.41	27.8	1.02(Richmond)	5.36(Manchester)	103
CLASS90	3.43	27.9	1.01(Richmond)	5.47(Manchester)	103
CLASS91-94	3.46	28.9	1.00(Richmond)	6.95(Tower Hamlets)	115

note * standardised values which have all been made positive.

Authorities:

n=103 (39 Non-Metropolitan Counties, 36 Metropolitan Districts, 20 Outer London Boroughs, 8 Welsh Counties)

n=115 (39 Non-Metropolitan Counties, 36 Metropolitan Districts, 20 Outer London Boroughs, 8 Welsh Counties, 12 Inner London Boroughs)

Table 4.11 presents data relating to lone parents between 1981 and 1991. This indicator is the same in 1981 as 1991: % of households with children aged 0-4 years which are headed by a lone parent [11]. As indicated in the Table, the depth of need

[11] The values presented for this indicator in Table 4.11 are the actual values and not standardised scores.

represented by lone parents decreased from 9.18 % to 7.08% over the period. The variation between authorities was stable until the Inner London Boroughs were added to the data set. The variation between authorities was the same in 1989 as 1981 where the coefficient of variation is 31.9. The minimum values indicate that across all authorities, at least 3-4% of households are lone parent households with children aged 0-4 years. There is a high level of variation between the authorities with least lone parent households and those with the most. Manchester has the highest lone parent households throughout the 1981-1990 period, with Southwark replacing Manchester in 1991. Both of these authorities have over 4 times the % of lone parents than Surrey. A comparison of the changing needs of Surrey and Manchester indicates that lone parent households with children decreased by 28.7% between 1984 and 1990 in Surrey and by 16.7% in Manchester across the same period. Thus, whilst the level of need decreased in all areas, need is decreasing at a lower rate in some areas.

Table 4.11: The Depth of Need for Nursery Education (Lone Parents) in England and Wales 1981-1994

Variable	Mean	CV	Minimum	Maximum	n
NLONE81	9.18	31.9	4.27(Humberside)	19.99(Manchester)	103
NLONE82	8.91	31.6	4.53(Humberside)	19.47(Manchester)	103
NLONE83	8.64	31.4	4.78(Humberside)	18.96(Manchester)	103
NLONE84	8.37	31.3	4.60(Surrey)	18.45(Manchester)	103
NLONE85	8.09	31.2	4.38(Surrey)	17.94(Manchester)	103
NLONE86	7.82	31.2	4.16(Surrey)	17.43(Manchester)	103
NLONE87	7.55	31.3	3.94(Surrey)	16.91(Manchester)	103
NLONE88	7.28	31.5	3.72(Surrey)	16.40(Manchester)	103
NLONE89	7.01	31.9	3.50(Surrey)	15.89(Manchester)	103
NLONE90	6.73	32.6	3.28(Surrey)	15.38(Manchester)	103
NLONE91-94	7.08	39.9	3.06(Surrey)	15.72(Southwark)	115

Authorities:

n=103 (39 Non-Metropolitan Counties, 36 Metropolitan Districts, 20 Outer London Boroughs, 8 Welsh Counties)

n=115 (39 Non-Metropolitan Counties, 36 Metropolitan Districts, 20 Outer London Boroughs, 8 Welsh Counties, 12 Inner London Boroughs)

Table 4.12 presents depth of need represented by large families. The actual, rather than the standardised values are presented because the indicator is the same in 1981 and 1991. The pattern of need presented in this Table is very different from the indicators which have already been considered above. The authorities with the least need are urban authorities and those with the most needs are rural areas. This may suggest that households with 2 or more dependent children aged 0-4 years are likely to live in rural, rather than urban areas. The variation between authorities is lower than that for Social Classes IV and V in the previous Table. Over the period, the variation in large families increased from 6.60 to 7.66.

Table 4.12: The Depth of Need for Nursery Education (Large Families) in England and Wales 1981-1994

Variable	Mean	CV	Minimum	Maximum	n
NLGE81	34.84	6.60	1.00(Haringey)	37.60(Buckinghamshire)	103
NLGE82	32.80	6.61	0.97(Haringey)	37.21(Buckinghamshire)	103
NLGE83	30.75	6.63	0.95(Haringey)	34.81(Buckinghamshire)	103
NLGE84	28.71	6.65	0.93(Haringey)	32.42(Buckinghamshire)	103
NLGE85	26.66	6.71	0.91(Haringey)	30.02(Buckinghamshire)	103
NLGE86	24.62	6.82	0.90(Haringey)	27.64(Buckinghamshire)	103
NLGE87	22.57	6.95	0.89(Haringey)	25.32(Oxfordshire)	103
NLGE88	20.53	7.16	0.89(Haringey)	23.07(Surrey)	103
NLGE89	18.48	7.52	0.89(Haringey)	20.87(Surrey)	103
NLGE90	16.44	7.96	0.90(Haringey)	18.67(Surrey)	103
NLGE91-94	14.18	7.66	1.00(Tower Hamlets)	16.47(Surrey)	115

Authorities:

n=103 (39 Non-Metropolitan Counties, 36 Metropolitan Districts, 20 Outer London Boroughs, 8 Welsh Counties)

n=115 (39 Non-Metropolitan Counties, 36 Metropolitan Districts, 20 Outer London Boroughs, 8 Welsh Counties, 12 Inner London Boroughs)

Table 4.13 presents the data relating to the depth of need measured in terms of overcrowding. The coefficient of variation indicates that the variation between authorities decreased between 1981 and 1990, with an increase in 1991 when the Inner London Boroughs were added to the data set. Rural areas have the least overcrowding (Somerset, N. Yorkshire and Powys). All of the authorities with the highest levels of overcrowding are London Boroughs. These areas have at least four times the level of need which exists in rural areas.

Table 4.13: The Depth of Need for Nursery Education (Overcrowding *) in England and Wales 1981-1994

Variable	Mean	CV	Minimum	Maximum	n
NPPR81	2.20	45.0	1.00(Somerset)	5.23(Newham)	103
NPPR82	2.15	43.7	1.01(Somerset)	4.95(Newham)	103
NPPR83	2.09	42.5	1.02(Somerset)	4.67(Newham)	103
NPPR84	2.04	41.1	1.03(N. Yorkshire) (Somerset)	4.39(Newham)	103
NPPR85	1.99	39.6	1.03(Somerset)	4.13(Barking)	103
NPPR86	1.93	38.8	1.03(Somerset)	4.00(Barking)	103
NPPR87	1.88	37.7	1.03(Somerset)	4.23(Merton)	103
NPPR88	1.82	37.9	1.03(Somerset)	4.49(Merton)	103
NPPR89	1.77	37.2	1.03(Somerset)	4.75(Merton)	103
NPPR90	1.72	37.7	1.02(Somerset)	5.01(Merton)	103
NPPR91-94	1.89	52.9	1.00(Powys)	7.56(Tower Hamlets)	115

note * standardised values which have all been made positive.

Authorities:
n=103 (39 Non-Metropolitan Counties, 36 Metropolitan Districts, 20 Outer London Boroughs, 8 Welsh Counties)
n=115 (39 Non-Metropolitan Counties, 36 Metropolitan Districts, 20 Outer London Boroughs, 8 Welsh Counties, 12 Inner London Boroughs)

Figures relating to no car ownership are presented in Table 4.14. The level of variation between authorities decreased between 1981 and 1990. An increase in the variations occurred in 1991. This is likely to have been due to the inclusion of the Inner London Boroughs in 1991. A high level of no car ownership is evident in the

urban authorities of Knowsley and Tower Hamlets. Surrey has the lowest depth of need on the basis of this indicator.

Table 4.14: The Depth of Need for Nursery Education (No Car *) in England and Wales 1981-1994

Variable	Mean	CV	Minimum	Maximum	n
NNCAR81	2.60	38.4	1.00(Surrey)	5.23(Knowsley)	103
NNCAR82	2.59	38.2	1.00(Surrey)	5.17(Knowsley)	103
NNCAR83	2.57	37.7	1.00(Surrey)	5.12(Knowsley)	103
NNCAR84	2.56	37.5	1.00(Surrey)	5.06(Knowsley)	103
NNCAR85	2.54	37.4	1.00(Surrey)	5.01(Knowsley)	103
NNCAR86	2.53	37.1	1.00(Surrey)	4.96(Knowsley)	103
NNCAR87	2.52	36.9	1.00(Surrey)	4.90(Knowsley)	103
NNCAR88	2.50	36.4	1.00(Surrey)	4.85(Knowsley)	103
NNCAR89	2.49	36.1	1.00(Surrey)	4.79(Knowsley)	103
NNCAR90	2.47	36.0	1.00(Surrey)	4.74(Knowsley)	103
NNCAR91-94	2.63	38.0	1.00(Surrey)	5.18(Tower Hamlets)	115

note * standardised values which have all been made positive.

Authorities:

n=103 (39 Non-Metropolitan Counties, 36 Metropolitan Districts, 20 Outer London Boroughs, 8 Welsh Counties)

n=115 (39 Non-Metropolitan Counties, 36 Metropolitan Districts, 20 Outer London Boroughs, 8 Welsh Counties, 12 Inner London Boroughs)

The final indicator of the depth of need is ethnic population (NNCW). In comparison with other indicators of the depth of need, there is a higher level of variation between authorities in the population from ethnic minority groups. The authorities with the least depth of need are all authorities located in the North of England. Whilst the vast majority of these authorities are located in rural areas, Knowsley does not fit with this general pattern. Knowsley is an urban area which has ranked high on the basis of other indicators of the depth of need (eg. no car ownership and Social Classes IV and V). Table 4.15 highlights the variation which exists between urban and rural authorities in terms of the depth of need.

Table 4.15: The Depth of Need for Nursery Education (Ethnic Population *) in England and Wales 1981-1994

Variable	Mean	CV	Minimum	Maximum	n
NNCW81	1.64	60.9	1.00(Durham)	6.28(Brent)	103
NNCW82	1.64	59.1	1.00(Durham)	6.12(Brent)	103
NNCW83	1.64	57.3	1.01(Durham)	5.95(Brent)	103
NNCW84	1.64	56.0	1.01(Durham)	5.78(Brent)	103
NNCW85	1.64	54.2	1.02(Cumbria) (Durham)	5.61(Brent)	103
NNCW86	1.64	53.0	1.02(Cumbria) (Durham)	5.44(Brent)	103
NNCW87	1.65	51.5	1.03(Cumbria) (Durham & St.Helens)	5.28(Brent)	103
NNCW88	1.65	50.9	1.03(Cumbria) (Durham, Knowsley) (& St.Helens)	5.11(Brent)	103
NNCW89	1.65	50.3	1.02(Knowsley)	4.94(Brent)	103
NNCW90	1.65	49.6	1.01(Knowsley)	4.77(Brent)	103
NNCW91-94	1.85	54.0	1.00(Knowsley)	5.75(Tower Hamlets)	115

note * standardised values which have all been made positive.

Authorities:

n=103 (39 Non-Metropolitan Counties, 36 Metropolitan Districts, 20 Outer London Boroughs, 8 Welsh Counties)

n=115 (39 Non-Metropolitan Counties, 36 Metropolitan Districts, 20 Outer London Boroughs, 8 Welsh Counties, 12 Inner London Boroughs)

Table 4.16 presents data relating to the index of the depth of need for nursery education. The Table shows that the average depth of need for nursery education decreased from 2.54 to 2.43 between 1981 and 1991. With the inclusion of the Inner London Boroughs in 1991, the average depth of need increased. The coefficient of variation indicates that the variation between authorities is higher than that relating to the child population presented in Table 4.9. This means that there is greater variation between authorities in the depth of need than in the breadth of need. Surrey has the lowest depth of need of all authorities. In comparison, Newham has over five times the depth of need as Surrey and Tower Hamlets over six times. Between 1981 and 1991, the depth of need in Newham fell annually. A comparison of Newham in 1990

and Tower Hamlets in 1991 indicates that the depth of need in Newham is 73% of the amount which exists in Tower Hamlets.

Table 4.16: Index of the Depth of Need for Nursery Education in England and Wales 1981-1991 *

Variable	Mean	CV	Minimum	Maximum	n
NDS81	2.54	40.5	1(Surrey)	5.59(Newham)	95
NDS82	2.51	39.4	1(Surrey)	5.52(Newham)	95
NDS83	2.48	38.7	1(Surrey)	5.46(Newham)	95
NDS84	2.45	37.9	1(Surrey)	5.39(Newham)	95
NDS85	2.42	37.1	1(Surrey)	5.33(Newham)	95
NDS86	2.38	36.5	1(Surrey)	5.27(Newham)	95
NDS87	2.35	35.7	1(Surrey)	5.20(Newham)	95
NDS88	2.32	34.9	1(Surrey)	5.14(Newham)	95
NDS89	2.26	33.6	1(Surrey)	5.07(Newham)	103
NDS90	2.23	33.1	1(Surrey)	5.01(Newham)	103
NDS91-94	2.43	41.1	1(Surrey)	6.82(Tower Hamlets)	115

note * standardised values which have all been made positive.

Authorities:

n=95 (39 Non-Metropolitan Counties, 36 Metropolitan Districts, 20 Outer London Boroughs)

n=103 (39 Non-Metropolitan Counties, 36 Metropolitan Districts, 20 Outer London Boroughs, 8 Welsh Counties)

n=115 (39 Non-Metropolitan Counties, 36 Metropolitan Districts, 20 Outer London Boroughs, 8 Welsh Counties, 12 Inner London Boroughs)

Table 4.17 presents the data relating to the total need for nursery education (NEEDS). This measure of need encompasses the child population and the level of disadvantage across areas between 1981 and 1994. The Table shows that the average level of need for nursery education decreased slightly over the ten year period - from 10.4 in 1981 to 9.7 in 1994. The variation between authorities is high. The authorities with the least need for nursery education, with the exception of the London Borough of Richmond, are rural areas. The variation between these authorities and those with the highest total need is large. In 1993, for example, Tower Hamlets has over 17 times the level of need which Richmond has. In Newham in 1990, the authority has over 4 times the level of need as the mean of all authorities.

Across the period, the mean level of need decreased annually until 1991 when an increase is apparent. This increase may be associated with the inclusion of the Inner London boroughs in the analysis in this year. The coefficient of variation indicates that the variation between all authorities in the level of total need is increasing.

Table 4.17: Total Need for Nursery Education in England and Wales 1981-1994 *

Variable	Mean	CV	Minimum	Maximum	n
NEEDS81	10.4	53.7	1.5(Richmond)	30.9(Newham)	95
NEEDS82	9.57	54.7	1.4(Richmond)	27.7(Newham)	95
NEEDS83	9.74	54.9	2.0(Richmond)	29.3(Newham)	95
NEEDS84	9.41	56.2	1.9(Dorset &) East Sussex)	28.4(Newham)	95
NEEDS85	9.19	59.9	1.9(East Sussex)	30.6(Newham)	95
NEEDS86	9.07	59.2	1.9(Isle of Wight)	31.3(Newham)	95
NEEDS87	8.33	63.3	1.8(Isle of Wight)	32.3(Newham)	95
NEEDS88	8.67	61.2	1.8(Isle of Wight)	32.7(Newham)	95
NEEDS89	8.04	64.4	1.9(Isle of Wight &) Dorset	34.5(Newham)	103
NEEDS90	8.12	62.3	1.9(Isle of Wight)	33.8(Newham)	103
NEEDS91	8.68	67.9	2.1(Dorset)	38.4(Tower Hamlets)	115
NEEDS92	9.09	67.7	2.3(Richmond)	43.0(Tower Hamlets)	115
NEEDS93	9.32	66.8	2.6(Richmond)	44.5(Tower Hamlets)	115
NEEDS94	9.74	66.9	2.9(Dorset)	46.8(Tower Hamlets)	115

note * standardised values which have all been made positive.

Authorities:

n=95 (39 Non-Metropolitan Counties, 36 Metropolitan Districts, 20 Inner London Boroughs)

n=103 (39 Non-Metropolitan Counties, 36 Metropolitan Districts, 20 Outer London Boroughs, 8 Welsh Counties)

n=115 (39 Non-Metropolitan Counties, 36 Metropolitan Districts, 20 Outer London Boroughs, 8 Welsh Counties, 12 Inner London Boroughs)

The difference between Tables 4.9 and 4.17 is the influence of the index of the depth of need. In Table 4.9, the coefficient of variation between authorities was low in comparison with the high variation in Table 4.17. This indicates that within the measure NEEDS, it is disadvantage which is causing the wide variation between authorities. In both Tables, East Sussex, the Isle of Wight and Dorset have the least level of need. The authorities which have the highest level of need on the basis of

both the child population (CTP) and the child population together with disadvantage (NEEDS) are all urban authorities (Newham and Tower Hamlets). Although both Knowsley and Bradford both have a high child population (Table 4.9), these areas do not rank as the highest in terms of total need. Whilst the depth of need in Newham decreased between 1981 and 1990 (Table 4.13), the breadth of need was broadly increasing (Table 4.9). This meant that Newham had the greatest total need for nursery education.

This examination of the need for nursery education indicates that the breadth of need, measured in terms of the average number of children per 1,000 population, has increased in the period under review. The depth of need for nursery education was also lower in 1990 than in 1981. The depth of need increased in 1991 with the inclusion of the Inner London Boroughs into the data set. Across the period, there is a slight decrease in total need, identified in terms of the child population together with the level of disadvantage between 1981 and 1991. There is less variation between authorities in relation to the breadth of need (number of children per 1,000 population) than there is in the depth of need. Of the depth of need indicators, there is least variation between local authorities in large families and Social Classes IV and V. Ethnic population displays the greatest amount of variation.

The geographical variations between authorities in the need for nursery education have been highlighted. In particular, the variations between and rural areas such as Dorset, East Sussex, Isle of Wight and Surrey and the urban authorities of Newham and Tower Hamlets have been focused on as these authorities have the lowest and highest levels of both breadth and total need across all authorities. Bradford and Knowsley also have a high breadth of need. In general, the authorities with the greatest depth of need are London Boroughs, particularly Newham and Tower

Hamlets. In each of the three dimensions of need, therefore, the some of the London Boroughs have the highest needs of all of the types of authorities. The Metropolitan Districts of Manchester and Knowsley also have a high depth of need. In general, many of the Non-Metropolitan County areas have the least need.

The depth of need for nursery education is clearly concentrated in urban centres, such as Knowsley, Manchester, Newham and Tower Hamlets. The main exception to this is the % of households with two or more children under 4 years. The authorities with the greatest depth of need are the rural areas of Buckinghamshire and Surrey, for example. The breadth of need is more geographically spread where the Non-Metropolitan Counties of Dorset and East Sussex and the London Borough of Westminster have the lowest breadth of need between 1981 and 1991. The Metropolitan Districts of Knowsley and Bradford and the London Borough of Newham have the greatest breadth of need. The breadth of need, whilst spread across the different types of authorities, also shows an urban/rural split. The areas with the highest child population aged 3 and 4 are urban authorities. Total need is also greatest in urban areas and lowest in rural authorities.

B. The Correlation Between Indicators of the Need for Nursery Education

This section of the Chapter examines the correlation between indicators of the need for nursery education. The correlations are presented in Tables 4.18 - 4.29. As the depth of need indicators between 1982 and 1990 have been derived from the 1981 and 1991 figures, the correlations between the individual depth of need variables and the index of need is likely to be strong. In addition, both the breadth and total dimensions of need are likely to be strongly related to total need as this indicator has been derived from both of these dimensions.

Table 4.18 presents the average correlation between the indicators of need in the period 1981-1994 [12]. The Table shows that the average breadth of need, the child population (AVCTP) is strongly related to the index of the depth of need. Of the individual indicators, Social Classes IV and V has the highest correlation with the breadth of need. The correlation of .5036 indicates a moderate relationship. All of the correlations are moderate, with the exception of average large families, where a negative significant relationship exists. Overall, it may be concluded that the breadth and depth of need are moderately related. As expected, the average correlations between the indicators of the depth of need and the index of need are strong. Of these correlations, the strongest relationships are between the index and average overcrowding (AVNPPR), average lone parent households (AVNLONE) and average no car households (AVNNCAR). These variables therefore have the greatest influence in the index of need. Both the breadth and depth of need are strongly related to total need.

[12] The correlation between need indicators 1981-1991 is examined since the depth of need between 1992-1994 is the same as 1991.

Table 4.18: The Average Correlation Between Indicators of Need 1981-1994

	[Breadth of Need]	Depth of Need						[Total Need]
	AV CTP	AV CLASS	AV NLONE	AV NLGE	AV NPPR	AV NNCAR	AV NNCW	AV NDS	AV NEEDS
AVCTP	1.0000								
AVCLASS	.5036 ***	1.0000							
AVNLONE	.3803 ***	.5552 ***	1.0000						
AVNLGE	-.2982 **	-.5356 ***	-.7029 ***	1.0000					
AVNPPR	.4751 ***	.3515 ***	.6556 ***	-.5311 ***	1.0000				
AVNNCAR	.4618 ***	.8065 ***	.8192 ***	-.7801 ***	.5230 ***	1.0000			
AVNNCW	.3921 ***	-.0258	.3215 **	-.2764 *	.6955 ***	.0989	1.0000		
AVNDS	.5988 ***	.6952 ***	.8396 ***	-.7243 ***	.8573 ***	.8294 ***	.5962 ***	1.0000	
AVNEEDS	.8354 ***	.6717 ***	.7116 ***	-.5730 ***	.7806 ***	.7202 ***	.5843 ***	.9172 ***	1.0000

Key:

Significance levels:

*	0.05 or better
**	0.01 or better
***	0.001 or better

Variables:

AVCTP	Average 3 and 4 year olds per 1,000 of the population
AVCLASS	Average % of all households with children aged under 16 years where head of household is in Social Classes IV & V 1981, % of economically active heads of household in Social Classes IV and V with children aged 0-15 years 1991
AVNLONE	Average % of households with children aged 0-4 years which are headed by a lone adult 1981, % of households with children aged 0-4 years which are headed by a lone parent 1991
AVNLGE	Average % of households with children aged 0-4 years which have 2 or more dependent children 1981, % of households with children aged 0-4 years which have 2 or more dependent children 1991
NPPR81	Average % of children aged 0-4 years with one or more persons per room 1981, % of households with children aged 0-4 years with one or more persons per room 1991
NNCAR81	Average % of children aged 0-4 who are in households which have no car 1981, % of all households with children aged 0-4 years where head is born in New Commonwealth 1991
NNCW81	Average % of children aged 0-4 years where household head is born in New Commonwealth, % of households with children aged 0-4 years with no car 1991
AVNDS	Average Depth of Need 1981-1994
AVNEEDS	Average Total Need 1991-1994.

The correlations between the indicators of need in each year are presented in Tables 4.19 - 4.29 (see Appendix II). The correlations between the depth indicators of need in 1981 and 1991 have already been examined in Tables 4.4 and 4.5 in this Chapter. Since the depth of need indicators in each year 1982-1990 are derived from the 1981 and 1991 measures, many of the correlations presented in these Tables are the same as the earlier Tables. Only the breadth of need, the index of need and total need have been added. Since the index is a combined indicator of the individual depth of need measures, the correlations between these are, as expected, strong. In terms of the relationship between the breadth and depth of need, it can be seen that the breadth of need and a number of the indicators of the depth of need became significantly related in 1985. For example, lone parents were not significantly related between 1981 and 1984. In 1985, lone parents became positively related to the breadth of need. The correlations became stronger between 1985 and 1991. The average correlations, which highlighted a moderate positive correlation overall, disguise the insignificant correlation in the 1981-1984 period. Another variable, no car (NNCAR) was only weakly correlated with the breadth of need (CTP) in 1981 and 1982. This correlation was moderate in the later years.

In sum, the correlation between the breadth and the individual indicators of the depth of need for nursery education is moderate. The breadth of need is strongly related to the index of need. Both the breadth and depth of need are strongly related to total need.

C. The Variations Within Nursery Education Need 1981-1994

This section of the Chapter examines the variations in the need for nursery education between 1981 and 1994. Table 4.30 below presents the correlations between the indicators of need. As indicated in the Table, there is substantial stability in the need

for nursery education. The coefficient of variation of the depth and total need indicators is zero. This may be influenced by the method which has been used to calculate these variables. The minimum and maximum years highlights that the lowest correlation for a number of the indicators is between 1990 and 1991 and the highest 1981 and 1982. With reference to the method of calculating the indicators, this may suggest that the level of need in 1981 was closer to predicting need in 1982 than 1991 was in 1990. Whilst this may be the case, the mean correlations between all of the years under review are all high.

Table 4.30: The Correlation Between the Indicators of Nursery Education Need 1981-1994

Variable	Average Correlation *	CV	Minimum	Maximum
CTP	.9692	1.07	.9399(1985 & 1986)	.9896(1992 & 1993)
CLASS	.9987	0.00	.9986(1987 & 1988)	.9989(1981 & 1982)
NLONE	.9983	0.00	.9974(1990 & 1991)	.9990(1982 & 1983)
NLGE	.9973	0.00	.9937(1990 & 1991)	.9993(1981 & 1982)
NPPR	.9958	0.00	.9930(1990 & 1991)	.9901(1981 & 1982)
NNCAR	.9998	0.00	.9998(1984 - 1990)	.9999(1981 - 1983)
NNCW	.9984	0.00	.9979(1990 & 1991)	.9990(1981 & 1982)
NDS	.9993	0.00	.9991(1989 & 1990)	.9997(1981 & 1982)
NEEDS	.9920	0.00	.9802(1982 & 1983)	.9979(1992 & 1993)

* Note: the average correlation is obtained by summing the correlations between the variables for each year and dividing this figure by their number.

Variables:

CTP	3 & 4 year olds per 1,000 population 1981-1994
CLASS81	% of all households with children aged under 16 years where head of household is in Social Classes IV & V 1981
CLASS91	% of economically active heads of household in Social Classes IV and V with children aged 0-15 years 1991
NLONE81	% of households with children aged 0-4 years which are headed by a lone adult 1981
NLONE91	% of households with children aged 0-4 years which are headed by a lone parent 1991
NLGE81	% of households with children aged 0-4 years which have 2 or more dependent children 1981
NLGE91	% of households with children aged 0-4 years which have 2 or more dependent children 1991
NPPR81	% of children aged 0-4 years with one or more persons per room 1981
NPPR91	% of households with children aged 0-4 years with one or more persons per room 1991
NNCAR81	% of children aged 0-4 who are in households which have no car 1981
NNCAR91	% of households with children aged 0-4 years with no car 1991
NNCW81	% of children aged 0-4 years where household head is born in New Commonwealth
NNCW91	% of all households with children aged 0-4 years where head is born in New Commonwealth 1991
NDS	Index of Need for Nursery Education 1981-1994
NEEDS	Total Need for Nursery Education 1981-1994

In terms of the breadth of need, the child population also shows little variation from one year to the next. The lowest correlation is between 1985 and 1986 (.9399). Overall, there is substantial stability in the need for nursery education between 1981 and 1994.

Conclusion

This Chapter has identified the need for nursery education. It has discussed three alternative approaches to the definition of need in nursery education. Each of these three approaches was adopted. In the first, all children aged 3-4 years are considered to be in need of nursery education. This approach represents a measure of the breadth of need. The second approach provides a measure of the depth of need in which only those children who are disadvantaged are in nursery educational need. In the third approach, the total dimension of need has been included. This approach encompasses aspects of both the breadth and depth of need. The measure developed includes all children under five taking account of the level of disadvantage. In measuring disadvantage, those factors identified by existing evidence as being most closely associated with need in nursery education have been included. These indicators of need have been used to assess the extent of nursery educational need in England and Wales. Between 1981-1994, the average level of need for nursery education increased overall. The variation between local authorities in the level of nursery educational need has been highlighted. In the Chapter which follows, the extent to which these variations in the need for nursery education are related to the provision of the service will be discussed. It is therefore to the issue of territorial justice in nursery education that this study now turns.

Chapter 5: Territorial Justice in Nursery Education

Introduction

This Chapter focuses on the extent of territorial justice within nursery education provision in England and Wales between 1981-1994. It is divided into three parts. In part one, the measures of need and provision adopted in this study are summarised and the statistical requirements for achieving territorial justice in this service area are reviewed. Part two presents evidence on the extent of territorial justice in nursery education in England and Wales 1981-1994. In part three, the evidence is evaluated and conclusions are drawn on the extent to which the need for this service is correlated with its provision.

I. Need and Provision in Nursery Education

A. The Measurement of Need and Provision

The concepts and measures of need and provision have already been discussed in relation to nursery education (in previous two Chapters). The measures are summarised in Table 5.1. The measures of need fall into the three categories: breadth, depth and total need. Children aged 3-4 years per 1,000 population (CTP) represents a measure of the breadth of need. Depth of need is measured on the individual indicators of the depth of need, together with the index of need developed in the previous Chapter. A measure of total need (NEEDS) is also included in Table 5.1. This measure is based on the number of children per 1,000 population times the sum of the level of disadvantage (index of the depth of need) in an area.

Table 5.1: Measures of Need and Provision in Nursery Education

NEED

Measure	Indicator	Label	Dimension	Source
BREADTH OF NEED:				
3 & 4 year olds	3 & 4 year olds per 1,000 population 1981-1994	CTP	Breadth	1&2
DEPTH OF NEED 1981-1990: *				
Social Class IV & V	% of all households with children aged under 16 years where head of household is in Social Classes IV & V 1981	CLASS	Depth	3
	% of economically active heads of household in Social Classes IV and V with children aged 0-15 years 1991	CLASS	Depth	4
Lone Parent Families	% of households with children aged 0-4 years which are headed by a lone adult 1981	NLONE	Depth	3
	% of households with children aged 0-4 years which are headed by a lone parent 1991	NLONE	Depth	4
Large Families	% of households with children aged 0-4 years which have 2 or more dependent children 1981	NLGE	Depth	3
	% of households with children aged 0-4 years which have 2 or more dependent children 1991	NLGE	Depth	4

Measure	Indicator	Label	Dimension	Source
Housing Conditions	% of children aged 0-4 years in households with one or more persons per room 1981	NPPR	Depth	3
	% of households with children aged 0-4 years with one or more persons per room 1991	NPPR	Depth	4
Low Income	% of children aged 0-4 who are in households which have no car 1981	NNCAR	Depth	3
	% of households with children aged 0-4 years which have no car 1991	NNCAR	Depth	4
Non-English Speaking Children	% of children aged 0-4 years where household head is born in New Commonwealth 1981	NNCW	Depth	3
	% of all households with children aged Children 0-4 years where head is born in New Commonwealth 1991	NNCW	Depth	4

Measure	Indicator	Label	Dimension	Source
THE DEPTH OF NEED 1991: *				
Social Class IV & V	% of economically active heads of household in Social Classes IV and V with children aged 0-15 years 1991	CLASS	Depth	4
Lone Parent Families	% of households with children aged 0-4 years which are headed by a lone parent 1991	NLONE	Depth	4
Large Families	% of all households with children aged 0-4 years which have 2 or more dependent children 1991	NLGE	Depth	4
Housing Conditions	% of all households with children aged 0-4 years with one or more persons per room 1991	NPPR	Depth	4
Low Income	% of households with children aged 0-4 years which have no car 1991	NNCAR	Depth	4
Non-English Speaking Children	% of all households with children aged 0-4 years where head is born in New Commonwealth 1991	NNCW	Depth	4

* These depth of need indicators are used separately and together in an index of the depth of need.

Measure	Indicator	Label	Dimension	Source
TOTAL NEED 1981-1990				
Breadth of Need	3 & 4 year olds per 1,000 of the population 1981-1990 multiplied by:	NEEDS	Total	1&2
Depth of Need	Index of the depth of Need 1981-1990 **			3 & 4

** The Depth of Need between 1981-1990 incorporates the 1981 and 1991 depth of need measures as indicated in the text.

TOTAL NEED 1991-1994				
Breadth of Need	3 & 4 year olds per 1,000 of the population 1991-1994 multiplied by:	NEEDS 1991-1994	Total	1&2
Depth of Need	Indicators of the Depth of Need in 1991			3&4

Measure	Indicator	Label	Dimension	Aspect	Source
PROVISION 1981-1994					
BREADTH OF PROVISION:					
Full-Time Nursery Places	Full-time places per 1000 3 & 4 year olds 1981-1994	FPC	Breadth	Output	1&2
Part-time Nursery Places	Part-time places per 1000 3 & 4 year olds 1981-1994	PPC	Breadth	Output	1&2
Total Nursery Places	Total places per 1000 3 & 4 year olds 1981-1994	PC	Breadth	Output	1&2
Nursery School & Class Places	Nursery school and class places per 1000 3 & 4 year olds 1981-1994	NSACL	Breadth	Output	1&2
Infant Class Places	Infant class places per 1000 3 & 4 year olds 1981-1994	INF	Breadth	Output	1&2
DEPTH OF PROVISION:					
Expenditure	Net expenditure in nursery schools per pupil 1981-1987	NEXPP	Depth	Input	5
Staff: Teaching	Teachers per 1,000 pupils in nursery schools 1981-1994	TEACH	Depth	Input	1
Staff: All	Total staff per 1,000 pupils in nursery schools 1981-1994 (includes non-teaching staff)	STAFF	Depth	Input	1

Measure	Indicator	Label	Dimension	Aspect	Source
TOTAL PROVISION:					
Expenditure	Net expenditure in nursery schools per 3 & 4 year old 1981-1987	NEXTC	Total	Input	5
QUALITY OF PROVISION:					
Quality Nursery Places	% of all places provided in nursery schools and classes 1981-1994	QUALP	Quality	Output	1&2

Sources:

1. Department of Education and Science. 1981-1994. *Pupils Under Five Years of Age in Schools in England.* Statistical Bulletin. (January of each year) (Department for Education: Government Statistical Service)
2. Welsh Office. 1989-1994. *Statistics of Education and Training in Wales: Schools* (Welsh Office: HMSO)
3. OPCS. 1981. *1981 Census of Population* County Reports for all Local Authorities included in this study
4. OPCS. 1991. *1991 Census of Population*. Crown Copyright. ESRC purchase
5. CIPFA. 1981-1987. *Education Actuals* (London: Public Finance Foundation)

In terms of nursery education provision, a range of breadth, depth and total measures are included in Table 5.1. The measures of the breadth of provision are: full-time and part-time places per 1,000 3 and 4 year olds (FPC and PPC); total places per 1,000 3 and 4 year olds (PC); nursery school and class places per 1,000 3 and 4 year olds (NSACL) and infant class places per 1,000 3 and 4 year olds (INF). Depth of provision is represented by the following measures: net expenditure per nursery school pupil (NEXPP); teachers per 1,000 pupils in nursery schools and classes (TEACH); and total staff per 1,000 pupils in nursery schools and classes (STAFF). STAFF seeks to reflect the overall staffing of these establishments and includes both teaching and non-teaching staff. Total provision is measured by expenditure per 3 and 4 year old (NEXTC). Quality of nursery education is measured by the proportion of all places provided in nursery schools and classes (QUALP).

The indicators of need and provision presented in Table 5.1 substantially improve the measurement of these concepts in previous studies of territorial justice in education in a number of ways. Firstly, the indicators are classified into the appropriate dimensions of need and provision. Thus CTP, for example, is classified as an indicator of the breadth dimension of need. The depth indicators of need are CLASS, NLONE, NLGE, NPPR, NNCAR, NNCW and NDS, the index of the depth of need. Existing studies, which have failed to consider the dimensions of the concepts of need and provision, do not include any measures of the depth dimension of need. This study is therefore the first to include indicators of the depth dimension of need. Secondly, this study measures total provision on the basis of a more appropriate population base than the majority of existing studies of territorial justice. With the exception of Blackstone (1971), total provision is represented in a number of studies by expenditure per 1,000 population (eg. Davies 1968, Pinch 1984). In this study of nursery education, total provision is measured on the basis of expenditure per 3 and 4

year old child as these children represent the relevant client group in nursery education. A more appropriate indicator of total provision in education within previous studies would therefore be expenditure per 1,000 pupils age 5-16 years, or expenditure per pupil age 5-16 years [13]. Thirdly, this study includes an indicator of the quality of service provision. The treatment of quality of service is completely neglected within previous studies of territorial justice in education. In other service areas, it is only the studies by Powell (1987, 1990b) which has included an assessment of the quality of provision. Powell's (1987) study of primary health care in London, finds evidence of a negative relationship between need and quality of service. Of 108 correlations between need and quality tested by Powell, 36 of these are negative at the 0.05 level. These provide evidence of territorial injustice in the quality of health services. In Powell (1990b) quality of health care is positively and negatively correlated with high need. Overall, 14 of the 32 correlations between need and quality of service indicate territorial injustice. Territorial justice is evident in 56% of the tests. Powell (1990b) therefore provides mixed evidence of territorial justice in the quality of health care services. The inclusion of quality in this study seeks to identify the relationship between need and quality within the context of nursery education. It is for these three reasons that this study meets the criteria identified by Boyne and Powell (1991) of an 'ideal' analysis of territorial justice. These criteria are: the assessment of the breadth and depth dimensions of need and both the quantity and quality of the outputs of service provision. The inclusion of total need and total provision in this study means that it encompasses not only the 'ideal' dimensions of the breadth and depth of need, but that it also makes a complete assessment of every dimension of need and provision, including the quality of service.

[13] Both of these indicators are effectively the same measure - the latter indicator is expenditure per pupil aged 5-16 years and the former expenditure per 1,000 of these pupils.

B. Time Period

The need and provision variables presented in Table 5.1 relate to the years 1981-1994 inclusive. The provision of nursery places data refers to each year between 1981-1994. Expenditure figures refer to 1981-1987 since these are the only years for which separate nursery education data is available [14]. In relation to the measurement of nursery educational need, data on the child population in each area (CTP) refers to each year between 1981-1994. The depth of need measures also relate to each year between 1981-1991. In the 1981-1990 period, both the 1981 and 1991 Census data have been used to create the indicators of the depth of need in each year. Depth of need in the period 1991-1994 refers to 1991 only since the data has been obtained from the 1991 Census of Population. The measures of total need (NEEDS) relate to each year between 1981-1994 [15].

The appropriate time period within which need and provision may be compared in education is one in which variables relating to the same year may be correlated. Indicators of nursery education provision will be correlated with measures of need relating to the same year.

C. The Statistical Requirements for Territorial Justice in Nursery Education

This section of the Chapter restates the statistical requirements for the achievement of territorial justice in nursery education outlined in Chapter two. The Davies (1968) criterion for territorial justice, a positive correlation between need and provision, has been revised. Territorial justice is more appropriately assessed on the basis of the rules which have been developed in Chapter two. The rules will now be applied to

[14] In 1988, nursery education expenditure data was combined with primary education figures in the data source.

[15] Within NEEDS 1991-1994, only the breadth dimension of need (CTP) changes annually since the depth dimension of need in these years is available for 1991 only.

determine the level of territorial justice in nursery education. The rules are re-presented below:

Rules for Assessing Territorial Justice

Territorial Justice Requires:

Rule 1: Positive significant correlation where corresponding dimensions of need and provision are compared;

Rule 2: Insignificant correlation between BN and DP and between DN and BP if BN and DN are insignificantly related to each other;

Rule 3: Positive correlation between BN and TP, DN and TP, TN and BP and TN and DP if BN and DN are insignificantly related to each other;

Rule 4: Positive correlation between any dimension of need and any dimension of provision if BN is strongly positively correlated with DN;

Rule 5: Negative correlation between BN and DP and DN and BP if BN is strongly negatively correlated with DN;

Rule 6: Insignificant relationship between BN and TP and between DN and TP if BN is strongly negatively correlated with DN;

Rule 7: Insignificant correlation between any dimension of need and quality of service provision;

Key:

BN= Breadth of Need
DN= Depth of Need
TN= Total Need
BP= Breadth of Provision
DP= Depth of Provision
TP= Total Provision

The application of each of the rules will now be considered in terms of the requirements for territorial justice. Rule 1 applies in situations where corresponding

dimensions of need and provision are compared. Rule 1 is not dependent on the correlation between the breadth and depth of need.

Rule 2 requires an insignificant correlation between BN and DP and between DN and BP for territorial justice. This rule may be applied where the correlation between the breadth and depth of need is insignificant.

Rule 7 also requires an insignificant correlation for territorial justice. Each of the three dimensions of need should be insignificantly related to the quality of service provision. Quality of service ought not to vary with need. Thus as the level of need increases or decreases, the quality of service should remain constant.

In the identification of territorial justice on the basis of rules 2 and 7, insignificant correlations may be identified as those which are not significant at the 0.05 level (Bryman and Cramer 1990). Territorial injustice is represented by a positive or a negative relationship between need and provision. A positive correlation is indicative of injustice because it implies that the breadth of provision, for example, rises as the depth of need increases (rule 2), or that the quality of service rises as need rises (rule 7). Similarly, a negative correlation is unjust since the breadth of service provision should not decrease as the depth of need increases (rule 2). A negative correlation between quality of service and need is also unjust as quality should not decrease as need increases (rule 7).

Rules 3, 4, 5 and 6 are dependent on the correlation between the breadth and depth of need before they can be applied. Rule 3 applies in situations where the relationship between the breadth and depth of need is insignificant. Territorial justice requires a positive correlation between BN and TP, DN and TP, TN and BP and TN and DP to

reflect the increase in one of the dimensions of need. For example, in relation to the correlation between BN and TP, as breadth and depth of need are uncorrelated, increases in the breadth of need should be positively correlated with the breadth dimension within total provision. Territorial justice requires a positive correlation between specific dimensions of need and provision to reflect the increase in one dimension of need or provision.

Rule 3 is closely linked to rule 2 as they are both applied where the relationship between the breadth and depth dimensions of need is insignificant. As these dimensions of need are uncorrelated, neither the breadth of need and the depth of provision nor the depth of need and the breadth of provision should be positively related to each other. In situations therefore where the relationship between the breadth and depth of need is uncorrelated, rules 2 and 3 together relate to the territorial justice requirements of specific dimensions of need and provision.

The relationship between the breadth and depth of need also underpins rules 4-6. On the basis of these rules, this relationship can be positive or negative. Taking rules 4 and 5, the purpose of identifying the correlation between the breadth and depth of need is that these dimensions can act as proxy indicators for each other in situations where non-corresponding dimensions of need and provision are compared. This means, for example, where breadth and depth of need are strongly correlated, in situations where depth of need is compared with the breadth of provision, territorial justice requires a positive correlation. In this example, the depth of need is used as a proxy indicator of the breadth of need to enable the correlation of the non-corresponding dimensions of the depth of need and breadth of provision. The strength of the correlation between the dimensions of need determines the reliability and closeness of the proxy indicator to the actual indicator. In situations where the

correlation between the breadth and depth of need is strongly positive, it may be concluded that one dimension of need is a reliable proxy of the other dimension.

Rule 4 applies in situations where the correlation between the breadth and depth of need is strongly positive. As the breadth and depth are correlated in this way, any dimension of need may be correlated with any dimension of provision. Territorial justice therefore requires a positive correlation between need and provision.

Rule 5 applies where the correlation between the breadth and depth of need is strongly negative. This means that areas which have a high breadth of need have low depth of need. As these two dimensions of need are strongly negatively related, where either of these dimensions is compared with the breadth or depth of provision, territorial justice requires a negative correlation. Thus, for example, where the breadth of need is related to the depth of provision, a negative relationship is required for territorial justice so that the relationship between the depth of need and the depth of provision is positive. In this example, the breadth of need acts as a proxy for the depth of need. The proxy, however, is not positively, but inversely related with the relevant dimension of need. The strength of the negative correlation between the breadth and depth of need determines the extent to which the breadth or the depth of need is a reliable proxy indicator of the other dimension of need.

Rule 6 is also applicable where the correlation between the breadth and depth of need is strongly negative. The negative correlation between these dimensions means that the high breadth and low depth of need, or the low depth and high breadth of need, effectively cancel each other out. The purpose of identifying the correlation between the breadth and depth of need is not to use one dimension as a proxy for the other, as in rules 4 and 5, but rather to identify the extent to which they cancel each other out.

Territorial justice does not require either the breadth or the depth of need to be significantly correlated with total provision.

The application of rules 4, 5 and 6 require a framework for identifying the strength of the correlation between the breadth and depth of need. The positive and negative correlations between these dimensions in rules 4 and 5 have to be strong in order for proxy indicators to represent a reliable indicator of the other dimension of need. In rule 6, the negative correlation should also be strong so that the extent to which the breadth and depth are *opposites* of each other can be determined. The strength of the relationship between the breadth and depth of need can be determined by correlation coefficients. The stronger the coefficients, the more reliable the proxy indicator is as a reflection of the actual indicator (rules 4 and 5), and the greater the degree of certainty which can be associated with breadth and depth *canceling each other out* (rule 6). Thus a correlation close to +1, for example, between the breadth and depth of need indicates that the breadth and depth of need are reliable proxy indicators of each other. In this situation, the breadth of need can be correlated with the depth of provision in order to test territorial justice. Whilst these are non-corresponding dimensions of need and provision, since the breadth and depth of need are reliable proxy measures for each other, territorial justice requires a positive correlation between breadth of need and depth of provision (rule 4). Similarly, where the correlation between the dimensions of need is strongly negative (-1), it can be assumed that the proxy indicator is a valuable measure of the actual measure (rule 5). A strongly negative correlation between the breadth and depth of need also means that these dimensions, when correlated with total provision, have the effect of canceling each other out (rule 6).

However, correlation coefficients are rarely so strongly positive or negative. It is therefore necessary to identify a range of correlations which may be defined as strong. Boyne and Powell (1991) indicate that strong territorial justice is represented by a correlation coefficient of .6000 and above between need and provision. Applying this criterion of strength to the relationship between the breadth and depth dimensions of need, correlation coefficients of .6000 and above indicate a strong positive relationship between the dimensions of need and those below -.6000 indicate a strong negative relationship. Correlation coefficients which do not meet this criterion of strength may be described as uncorrelated. An uncorrelated relationship may be interpreted as an insignificant relationship between the breadth and depth of need. This does not mean that the dimensions of need are not positively and significantly correlated with each other. Instead, it means that they are not strongly correlated. Rules 2 and 3 are therefore relevant in the interpretation of these correlations.

Table 5.2 summarises the correlations between the breadth and depth of need which are required in rules 2-6 inclusive. Rules 2 and 3 are appropriately applied where the correlation between the breadth and depth of need is insignificant or in situations where the correlation between the dimensions of need do not meet the 'strength' criteria required in rules 4, 5 and 6. The relationship between the breadth and depth of need is strongly positive when the correlation is above .6000 (rule 4). Correlations below this level are identified as insignificant. A strongly negative correlation is one which is below -.6000 (rules 5 and 6). Those which are above this level, but less than .6000 are classified as insignificant. Rules 4, 5 and 6 are applicable where the correlation between the breadth and depth of need is strongly positive and strongly negative.

Table 5.2: The Correlation Between the Breadth and Depth of Need: The Application of Rules 2-6

Rule 2	Insignificant correlation (at the 5% level) between BN and DN or correlation of below .6000 or above -.6000 between BN and DN.
Rule 3	Insignificant correlation (at the 5% level) between BN and DN or correlation of below .6000 or above -.6000 between BN and DN.
Rule 4	Positive correlation between BN and DN (above .6000)
Rule 5	Negative correlation between BN and DN (below -.6000)
Rule 6	Negative correlation between BN and DN (below -.6000)

The correlation of corresponding dimensions of need and provision provides the most reliable evaluation of territorial justice. This is because the interpretation of the evidence is not dependent on the relationship between the dimensions of need. Greatest weight should be attached to evidence of territorial justice drawn on the basis of rule 1 than the other rules since a direct comparison is being made between the same dimensions of need and provision. Territorial justice applied in this way is much more specific than that outlined by Davies (1968).

In order to apply rules 2-6, it is necessary to correlate the breadth and depth dimensions of need. The breadth of need measure (CTP) can be correlated with the individual indicators of the depth of need (CLASS81-91, NLONE81-91, NLGE81-91, NPPR81-91, NNCAR81-91 and NNCW81-91) and the index of the depth of need (NDS81-91).

The correlation between the breadth of need and the individual indicators of the depth of need are presented in Tables 5.3 - 5.8. Table 5.3 presents the correlation between children per 1,000 population (CTP) and Social Classes IV and V (CLASS). The correlations indicate that the relationship between these measures of the breadth and depth of need is significantly positive across the whole period. However, the positive

correlations do not meet the strength criterion. On this basis, rules 2 and 3 are relevant in the interpretation of correlation coefficients.

Table 5.3: The Correlation Between the Breadth and Depth of Need 1981-1994 (Social Classes IV and V)

Depth of Need	Breadth of Need: CTP 1981-1994													
	81	82	83	84	85	86	87	88	89	90	91	92	93	94
CLASS81	*** .4144 (95)													
CLASS82		*** .4368 (95)												
CLASS83			*** .4397 (95)											
CLASS84				*** .4781 (95)										
CLASS85					*** .4789 (95)									
CLASS86						*** .4899 (95)								
CLASS87							*** .4898 (95)							
CLASS88								*** .4395 (95)						
CLASS89									** .4287 (103)					
CLASS90										*** .3795 (103)				
CLASS91											*** .4318 (115)	*** .4627 (115)	*** .4495 (115)	*** 4035 (115)

Key: CTP 1981-1994 — 3 and 4 year olds per 1,000 population
CLASS1981-1994 — Social Classes IV and V

Table 5.4 presents the correlation between the breadth of need and depth of need, represented by NLONE. The relationship between these indicators of need is uncorrelated between 1981 and 1984. The correlations are significantly positive between 1985 and 1993. The highest of the correlations is .5144*** between CTP89 and NLONE89. However, this does not meet the strength criterion. Rules 2 and 3 are appropriate in the identification of territorial justice.

Table 5.4: The Correlation Between the Breadth and Depth of Need 1981-1994 (Lone Parents)

	Breadth of Need CTP 1981-1994													
	81	82	83	84	85	86	87	88	89	90	91	92	93	94
Depth of Need														
NLONE81	.1208 (95)													
NLONE82		.1628 (95)												
NLONE83			.1435 (95)											
NLONE84				.1799 (95)										
NLONE85					** .3349 (95)									
NLONE86						*** .3610 (95)								
NLONE87							*** .4567 (95)							
NLONE88								*** .4465 (95)						
NLONE89									*** .5144 (103)					
NLONE90										*** .4492 (103)				
NLONE91											** .2691 (115)	* .2266 (115)	* .2080 (115)	* 2058 (115)

Key: CTP 1981-1994 3 and 4 year olds per 1,000 population
NLONE1981-1994 Lone Parents

Table 5.5 presents the correlation between the breadth of need and the depth of need, represented by large families (NLGE). This relationship is uncorrelated between 1981 and 1984, and negatively correlated between 1985 and 1993. Whilst the correlation between the breadth and depth of need in 1988 and 1989 is -.5779 and -.5904 respectively, all of the correlations are above the -.6000 threshold of strength. On this basis, rules 2 and 3 are relevant in the determination of territorial justice.

Table 5.5: The Correlation Between the Breadth and Depth of Need 1981-1994 (Large Families)

	Breadth of Need CTP 1981-1994													
	81	82	83	84	85	86	87	88	89	90	91	92	93	94
Depth of Need														
NLGE81	.1242 (95)													
NLGE82		.0109 (95)												
NLGE83			-.0305 (95)											
NLGE84				-.1240 (95)										
NLGE85					** -.3078 (95)									
NLGE86						*** -.3434 (95)								
NLGE87							*** -.4626 (95)							
NLGE88								*** -.4925 (95)						
NLGE89									*** -.5779 (103)					
NLGE90										*** -.5904 (103)				
NLGE91											*** -.4958 (115)	*** -.4678 (115)	*** -.4377 (115)	*** 3689 (115)

Key: CTP 1981-1994 — 3 and 4 year olds per 1,000 population
NLGE1981-1994 — Large Families

The correlation between the children and depth of need, represented by overcrowded housing, is presented in Table 5.6. In 1981 and 1982, the relationship is uncorrelated. Between 1983 and 1993 a positively significant correlation exists between these indicators. These correlations are not strongly positive. In this case, rules 2 and 3 are appropriately applied in the identification of territorial justice.

Table 5.6: The Correlation Between the Breadth and Depth of Need 1981-1994 (Overcrowding)

	Breadth of Need CTP 1981-1994													
	81	82	83	84	85	86	87	88	89	90	91	92	93	94
Depth of Need														
NNPPR81	.1294 (95)													
NPPR82		.1691 (95)												
NPPR83			* .2348 (95)											
NPPR84				* .2670 (95)										
NPPR85					*** .4648 (95)									
NPPR86						*** .4374 (95)								
NPPR87							*** .5342 (95)							
NPPR88								*** .5265 (95)						
NPPR89									*** .5487 (103)					
NPPR90										*** .4893 (103)				
NNPPR91											** .2774 (115)	** .2818 (115)	** .2608 (115)	*** .3323 (115)

Key: CTP 1981-1994 3 and 4 year olds per 1,000 population
NPPR1981-1994 Overcrowding

Table 5.7 presents the correlation between the breadth of need and no car. The correlations are significantly positive across the period. However, they do not meet the criterion of a strong correlation. On this basis, rules 2 and 3 are appropriately applied in the determination of territorial justice.

Table 5.7: The Correlation Between the Breadth and Depth of Need 1981-1994 (No Car)

Breadth of Need

CTP 1981-1994

Depth of Need	81	82	83	84	85	86	87	88	89	90	91	92	93	94
NNCAR81	* .2088 (95)													
NNCAR82		** .2756 (95)												
NNCAR83			** .3053 (95)											
NNCAR84				*** .3649 (95)										
NNCAR85					*** .4455 (95)									
NNCAR86						**** 4581 (95)								
NNCAR87							*** .5039 (95)							
NNCAR88								*** .5067 (95)						
NNCAR89									*** .5563 (103)					
NNCAR90										*** .5270 (103)				
NNCAR91											*** .4219 (115)	*** .3974 (115)	*** .3747 (115)	*** .3350 (115)

Key: CTP 1981-1994 3 and 4 year olds per 1,000 population
NNCAR1981-1994 No Car

The correlation between the breadth of need and ethnic population is presented in Table 5.8. The relationship is uncorrelated between 1981 and 1984 and positive between 1985 and 1993. Once again, since the positive correlations are not above .6000, the correlation between these indicators of the breadth and depth of need may be described as uncorrelated.

Table 5.8: The Correlation Between the Breadth and Depth of Need 1981-1994 (Ethnic Population)

	Breadth of Need CTP 1981-1994													
	81	82	83	84	85	86	87	88	89	90	91	92	93	94
Depth of Need														
NNCW81	.0530 (95)													
NNCW82		.0770 (95)												
NNCW83			.1406 (95)											
NNCW84				.1554 (95)										
NNCW85					** .3397 (95)									
NNCW86						** .3365 (95)								
NNCW87							*** .4591 (95)							
NNCW88								*** .5002 (95)						
NNCW89									*** .5579 (103)					
NNCW90										*** .5668 (103)				
NNCW91											*** .4347 (115)	*** .4001 (115)	*** .3815 (115)	*** .3892 (115)

Key: CTP 1981-1994 3 and 4 year olds per 1,000 population
NNCW1981-1994 Ethnic Population

Finally, the correlations between the breadth of need and the index of the depth of need are presented in Table 5.9 below. They show that the relationship between the breadth (CTP) and depth of need (NDS) across the period is positive. However, it is only between 1987 and 1990 where the correlation coefficients are above .6000. In these years, the correlation between the breadth and depth of need may be described as strongly positive. Rule 4 is therefore appropriate in the interpretation of correlation coefficients between 1987 and 1989.

Table 5.9: The Correlation Between the Breadth and Depth of Need 1981-1994 (Index of Need)

	Breadth of Need CTP 1981-1994													
Depth of Need	**81**	**82**	**83**	**84**	**85**	**86**	**87**	**88**	**89**	**90**	**91**	**92**	**93**	**94**
NDS81	** .2422 (95)													
NDS82		*** .2933 (95)												
NDS83			** .3461 (95)											
NDS84				*** .3951 (95)										
NDS85					*** .5589 (95)									
NDS86						*** .5659 (95)								
NDS87							*** .6681 (95)							
NDS88								*** .6818 (95)						
NDS89									*** .7481 (103)					
NDS90										*** .7206 (103)				
NDS91											*** .4934 (115)	*** 4724 (115)	*** .4476 (115)	*** .4400 (115)

Key: CTP 1981-1994 3 and 4 year olds per 1,000 population
NDS1981-1994 Index of the Depth of Need

In the other years, whilst the correlations between the dimensions of need are significantly positive, they do not meet the 'strength' criterion identified as a correlation above .6000. Rules 2 and 3 are therefore appropriate in the determination of territorial justice.

The correlations in Table 5.9 indicate that the relationship between the breadth and depth of need is strongly positive in the 1987-1990 period. Areas with a high child population also have a high depth of need. Since breadth and depth of need are positively correlated, either of these dimensions can act as a proxy indicator for the other in the assessment of territorial justice.

The correlations between the breadth of need and the individual components of the depth of need (Tables 5.3 - 5.8) indicate, with the exception of large families, that there is a significantly positive correlation between the breadth and depth of need. A negative correlation exists between the child population and large families. The highest correlations between the breadth and depth of need for most indicators are in the 1988-1990 period. For example, a correlation of .5563 exists between CTP89 and NNCAR89. Whilst these correlations are high, none of them are strongly positive or strongly negative according to the criteria which have been identified above. Rules 2 and 3 are therefore appropriately applied in the identification of territorial justice.

Of all the correlations tested, it is only the correlation between CTP and NDS in the 1987-1990 period that relationship between the breadth and depth of need is strongly positive. Breadth and depth of need are, on the whole, not strongly correlated with each other. This finding has important implications for the existing studies of territorial justice in education. It was argued in Chapter two that a positive correlation between need and provision is not appropriate unless a strong positive

relationship exists between the breadth and depth of need. The finding in this study is that the breadth and depth of need are not, in general, strongly positively correlated. If this relationship between the breadth and depth of need also exists in other service areas, then previous studies of territorial justice have inappropriately assessed territorial justice. Rather than seeking positive correlations between the breadth of need and depth of provision, for example, for territorial justice, the correlation which territorial justice required was insignificant.

Table 5.10 presents the areas and time periods examined in this study, the measures of need and provision adopted and the dimensions of need and provision reflected in these measures. The correlation required for territorial justice between each of the indicators of need and provision on the basis of the rules developed in this study is also presented. The rule on territorial justice which is applied in each of the correlations is indicated in brackets in Table 5.10.

Table 5.10: Territorial Justice in Nursery Education: Requirements

Areas and Time Period	Need Indicator	Dimension	Provision Measure	Dimension	Required for Territorial Justice Rules 1-7 1981-1986/1991-1994	Required for Territorial Justice Rules 1-7 1987-1990
Non-Metropolitan Counties 1981-1994	CTP	Breadth	FPC	Breadth	positive (1)	positive (1)
			PPC	Breadth	positive (1)	positive (1)
Metropolitan Districts 1981-1994			PC	Breadth	positive (1)	positive (1)
			NSACL	Breadth	positive (1)	positive (1)
			INF	Breadth	positive (1)	positive (1)
Outer London Boroughs 1981-1994			NEXPP	Depth	insignificant (2)	positive (4)
Inner London Boroughs 1991-1994			TEACH	Depth	insignificant (2)	positive (4)
			STAFF	Depth	insignificant (2)	positive (4)
			NEXTC	Total	positive (3)	positive (4)
Welsh Counties 1989-1994			QUALP	Quality	insignificant (7)	insignificant (7)
	NDS	Depth	FPC	Breadth	insignificant (2)	positive (4)
			PPC	Breadth	insignificant (2)	positive (4)
			PC	Breadth	insignificant (2)	positive (4)
			NSACL	Breadth	insignificant (2)	positive (4)
			INF	Breadth	insignificant (2)	positive (4)
			NEXPP	Depth	positive (1)	positive (1)
			TEACH	Depth	positive (1)	positive (1)
			STAFF	Depth	positive (1)	positive (1)
			NEXTC	Total	positive (3)	positive (4)
			QUALP	Quality	insignificant (7)	insignificant (7)

Areas and Time Period	Need Indicator	Dimension	Provision Measure	Dimension	Required for Territorial Justice Rules 1-7 1981-1994
	CLASS	Depth	FPC	Breadth	insignificant (2)
			PPC	Breadth	insignificant (2)
			PC	Breadth	insignificant (2)
			NSACL	Breadth	insignificant (2)
			INF	Breadth	insignificant (2)
			NEXPP	Depth	positive (1)
			TEACH	Depth	positive (1)
			STAFF	Depth	positive (1)
			NEXTC	Total	positive (3)
			QUALP	Quality	insignificant (7)
	NLONE	Depth	FPC	Breadth	insignificant (2)
			PPC	Breadth	insignificant (2)
			PC	Breadth	insignificant (2)
			NSACL	Breadth	insignificant (2)
			INF	Breadth	insignificant (2)
			NEXPP	Depth	positive (1)
			TEACH	Depth	positive (1)
			STAFF	Depth	positive (1)
			NEXTC	Total	positive (3)
			QUALP	Quality	insignificant (7)

Areas and Time Period	Need Indicator	Dimension	Provision Measure	Dimension	Required for Territorial Justice Rules 1-7 1981-1994
	NLGE	Depth	FPC	Breadth	insignificant (2)
			PPC	Breadth	insignificant (2)
			PC	Breadth	insignificant (2)
			NSACL	Breadth	insignificant (2)
			INF	Breadth	insignificant (2)
			NEXPP	Depth	positive (1)
			TEACH	Depth	positive (1)
			STAFF	Depth	positive (1)
			NEXTC	Total	positive (3)
			QUALP	Quality	insignificant (7)
	NPPR	Depth	FPC	Breadth	insignificant (2)
			PPC	Breadth	insignificant (2)
			PC	Breadth	insignificant (2)
			NSACL	Breadth	insignificant (2)
			INF	Breadth	insignificant (2)
			NEXPP	Depth	positive (1)
			TEACH	Depth	positive (1)
			STAFF	Depth	positive (1)
			NEXTC	Total	positive (3)
			QUALP	Quality	insignificant (7)

Areas and Time Period	Need Indicator	Dimension	Provision Measure	Dimension	Required for Territorial Justice Rules 1-7 1981-1994
	NNCAR	Depth	FPC	Breadth	insignificant (2)
			PPC	Breadth	insignificant (2)
			PC	Breadth	insignificant (2)
			NSACL	Breadth	insignificant (2)
			INF	Breadth	insignificant (2)
			NEXPP	Depth	positive (1)
			TEACH	Depth	positive (1)
			STAFF	Depth	positive (1)
			NEXTC	Total	positive (3)
			QUALP	Quality	insignificant (7)
	NNCW	Depth	FPC	Breadth	insignificant (2)
			PPC	Breadth	insignificant (2)
			PC	Breadth	insignificant (2)
			NSACL	Breadth	insignificant (2)
			INF	Breadth	insignificant (2)
			NEXPP	Depth	positive (1)
			TEACH	Depth	positive (1)
			STAFF	Depth	positive (1)
			NEXTC	Total	positive (3)
			QUALP	Quality	insignificant (7)

Areas and Time Period	Need Indicator	Dimension	Provision Measure	Dimension	Required for Territorial Justice Rules 1-7 1981-1988/1991-1994	Required for Territorial Justice Rules 1-7 1987-1990
	NEEDS	Total	FPC	Breadth	positive (3)	positive (4)
			PPC	Breadth	positive (3)	positive (4)
			PC	Breadth	positive (3)	positive (4)
			NSACL	Breadth	positive (3)	positive (4)
			INF	Breadth	positive (3)	positive (4)
			NEXPP	Depth	positive (3)	positive (4)
			TEACH	Depth	positive (3)	positive (4)
			STAFF	Depth	positive (3)	positive (4)
			NEXTC	Total	positive (1)	positive (1)
			QUALP	Quality	insignificant (7)	insignificant (7)

In this study, rules 1-4 and rule 7 are used to identify the existence of territorial justice. Rule 1 is applied where corresponding dimensions of need and provision are compared. Rules 2 and 3 are relevant where the correlation between the breadth and depth of need is insignificant. Rule 4 is applied in situations where the correlation between the breadth and depth of need is positive. Rule 7 is applied where any of the three dimensions of need is correlated with the indicator of quality of provision. Rules 5 and 6 have not been used in this study since these rules are relevant when there is a strongly negative correlation between the breadth and depth of need.

Of the rules applied in this study, rules 1, 3 and 4 require a positive correlation between need and provision. An insignificant correlation is required for territorial justice on the basis of rules 2 and 7. A framework is required in order to identify the strength of the correlation between indicators of need and provision for territorial justice is necessary. Taking the positive correlations first (rules 1, 3 and 4), the classifications which are presented below have been adopted. This framework was developed by Boyne and Powell (1991:269) for the purpose of determining the level of territorial justice in circumstances where corresponding dimensions of need and provision are compared. The classifications can therefore be applied where rule 1 is relevant. However, their use need not be restricted to the correlation of corresponding dimensions. In rule 3, since the correlation between the breadth and depth of need is insignificant, the positive correlation required for territorial justice must therefore be between one of these dimensions and either the depth or total provision. In other words, since the proxy indicators (breadth and depth of need) are not related, all of the positive correlation which is required for territorial justice is a function of the relationship between the other dimension and service provision. *It is as though* corresponding indicators are being correlated. In this case, the

classifications below are therefore appropriate in the determination of the strength of the correlation between need and provision where rule 3 is appropriate.

'injustice' if the relationship between need and provision is significantly negative
'unpatterned' if the coefficient is not significantly different from zero and the 0.05 level
'weak' territorial justice if the coefficient is positively significant but less than 0.30
'moderate' territorial justice if the coefficient is positively significant, greater than 0.30 but less than 0.60
'strong' territorial justice if the coefficient is positively significant and above 0.60

source: Boyne and Powell (1991:269)

Rule 4 also requires a positive correlation between need and provision. The classifications presented above may also be used to determine the strength of the correlation between need and provision. This is because rule 4 requires a strong positive correlation between the breadth and depth of need. Since breadth and depth of need are strongly related to each other, the correlation of any of these dimensions with provision means that *it is as though* corresponding dimensions of need and provision are being compared. The Boyne and Powell (1991) classifications are therefore appropriate in determining the strength of the correlation between need and provision where rule 4 applies.

Rules 2 and rule 7 both require an insignificant correlation between specific dimensions of need and provision for territorial justice. Insignificant correlations are those which are not significant at the 5% level. Since these correlations are insignificant, it is not possible to identify the strength of territorial justice which they are associated with. The level of territorial justice of insignificant correlations will not therefore be identified. These correlations will be described as territorially just where they are insignificant. In situations where either positive or negative correlations

exist, these are indicative of territorial injustice. The strength of the injustice can be determined from the value of the correlation coefficients. The Boyne and Powell (1991) classifications will be used to identify the strength of injustice. Those which are strongly positive, (above .60), are indicative of strong territorial injustice. Strong territorial injustice is also represented by strongly negative correlations (above -.60). The classifications, weak and moderate, can also used to identify the strength of the injustice.

The Boyne and Powell (1991) framework will be used to identify the strength of the evidence on territorial justice where rules 1, 3, and 4 apply. The framework will also be used to determine the strength of territorial injustice where rules 2 and 7 apply. The strength of territorial justice associated with insignificant correlations (rule 2 and rule 7) cannot be determined. These correlations will be described as justice where they are insignificant. Although rules 5 and 6 are not applied in this study, the Boyne and Powell framework is also appropriate in the identification of territorial justice on the basis of these rules [16].

This section of the Chapter has identified the statistical requirements for assessing territorial justice in this study of nursery education.. It has established the relationships required for territorial justice in each situation. The rules for the

[16] In relation to rule 5, since the breadth and depth of need are negatively correlated, the correlation of breadth of need and the depth of provision is, in this context, the *same as* a positive correlation between the depth of need and the depth of provision. On the basis that these are corresponding dimensions of need and provision, a positive correlation is indicative of justice. The negative correlation required in rule 5 for territorial justice is therefore the equivalent of a positive relationship. The Boyne and Powell (1991) classifications are therefore appropriate in the classification of correlations which apply rule 5 on territorial justice.

In relation to rule 6, territorial justice requires an insignificant correlation between the breadth of need and total provision or the depth of need and total provision. The strength of territorial justice cannot be determined from insignificant corrrelations. Where correlations are significant, they are indicative of territorial injustice. The Boyne and Powell (1991) classifications can be used to determine the strength of injustice as in rule 3.

assessment of territorial justice in this study are 1, 2, 3, 4 and 7. This means that territorial justice requires positive or insignificant correlations between need and provision. In situations where corresponding dimensions of need and provision are compared, the appropriate rule to apply is rule 1. Rules 2 and 3 are appropriate where the correlation between the dimensions of need are insignificantly related or where the correlation between the breadth and depth of need is below the 'strength' criterion of .6000 and above -.6000. Rule 4 is applicable where the correlation between the breadth and depth of need is strongly positive. Rule 7 is appropriately applied when need is correlated with the quality of service. The classifications developed by Boyne and Powell (1991) will be used to identify the level of territorial justice which exists where positive correlations are required. This framework will also be used to determine the extent of territorial injustice associated with positive or negative correlations where insignificant correlations were required for justice. In these situations, territorial justice will be represented by insignificant correlations.

This examination of the statistical requirements for territorial justice has revealed the complexities involved in the assessment of territorial justice. The correlation of corresponding indicators of need and provision represents the least complicated test of territorial justice. This test, embodied in rule 1, could be used to determine the existence of territorial justice without the application of the further rules. However, this would be unsatisfactory for three reasons. First, the availability of data limits the assessment of territorial justice. Data is frequently not available for the range of need and provision which might be included in an assessment of territorial justice. In this study, whilst measures of nursery provision, such as reading materials, would ideally be included in an assessment of territorial justice, such data are not available. The correlation of corresponding dimensions would therefore not yield much as much evidence on territorial justice compared to the application of all of the rules.

The second reason relates to the measurement of the breadth dimension of need. In any service, there is only a single indicator of the breadth dimension of need - the client population. In this study, for example, the breadth of need is represented by the number of 3 and 4 year olds per 1,000 population (CTP). This is the only possible indicator of the breadth of need. If the assessment of territorial justice were restricted to the correlation of corresponding dimensions of need and provision, the indicator of the breadth of need (CTP) could only be compared with FPC, PPC, PC, NSACL, and INF and not the indicators of the depth and total dimensions of provision. Fewer correlations would consequently have been produced, resulting in less evidence on territorial justice.

A third issue relates to the measurement of the depth and total dimensions of provision. In the measurement of these dimensions, resources have to be used to quantify the amount of service per client. The limitations of measuring service provision on the basis of resources have already been raised in this study. If the assessment of territorial justice were restricted to the application of rule 1, these limitations would have to be recognised where the depth and total dimensions of need were correlated the corresponding dimensions of provision.

The evaluation of territorial justice should not be restricted to the application of rule 1 because less evidence is likely to be produced. In addition, the assessment would be more reliant on resource indicators of service provision. Rules 2-7 provide additional criteria within which territorial justice can be assessed. The application of these rules is complex: rules 2-6 are dependent on the correlation between the breadth and depth of need and rule 7 requires an insignificant correlation between need and quality of service. However, whilst recognising the complexities involved in applying rules 2-7,

these rules provide the tools by which the extent of territorial justice associated with every dimension of need and provision can be assessed. The development of these rules is central in appropriately assessing territorial justice.

None of the rules developed in this study apply the Davies (1968) criterion of territorial justice. The rules significantly refine the statistical requirements of territorial justice established by Davies (1968). The measurement of territorial justice is consequently much more complex than that outlined by Davies (1968).

The next part of the Chapter moves on to examine the empirical evidence on territorial justice in nursery education.

II. Territorial Justice in Nursery Education - Empirical Evidence

This section examines the empirical evidence on the correlation between need and provision in nursery education. It is divided into three parts. In part one, the correlation between children aged 3 and 4 per 1,000 population (breadth of need) and service provision is examined. Part two focuses on the correlation between children living in disadvantaged circumstances (depth of need) and service provision. In part three, the relationship between the child population together with disadvantage (total need) and nursery education provision is examined.

The indicators of nursery education provision presented in all of the Tables in this section are separated into the dimensions of breadth, depth and total and the measure of quality. In theory, the correlations between corresponding dimensions of need and provision provide the most robust assessment of territorial justice as the same dimension of need is being compared with the same dimension of service provision.

Each Table includes the mean correlation between the indicators of need and provision across the period under review. In addition, a summary of the number of correlations which provide evidence of territorial justice and territorial injustice is presented for each indicator of provision. These figures enable comparisons between and across indicators of provision to be drawn.

A. The Correlation Between the Breadth of Need and Nursery Education Provision

This section assesses territorial justice in relation to the breadth of nursery education and service provision. As discussed above, the breadth of need indicator is 3 and 4 year olds per 1,000 of the population (CTP). Table 5.11 presents the correlations between the child population (CTP) and nursery education provision across all authorities in England and Wales.

Table 5.11: Correlations Between Breadth of Need (Children aged 3 and 4 per 1,000 Population [CTP]) and Nursery Education Provision in England and Wales 1981-1994

	[Breadth of Provision 1981-1994]					[Depth of Provision]			[Total Provision]	[Quality of [Provision]
	FPC	PPC	PC	NSACL	INF	NEXPP	TEACH	STAFF	NEXTC	QUALP
CTP81	.03	.01	.02	.06	-.04	-.15	-.15	-.08	-.06	.11
CTP82	.04	.10	.10	.16	-.06	-.11	-.14	-.06	.02	.22 *
CTP83	.03	.14	.12	.21 *	-.11	-.14	-.12	-.02	.14	.29 **
CTP84	.09	.20 *	.20 *	.28 **	-.04	-.08	-.08	-.06	.17	.32 **
CTP85	.07	.34 ***	.29 **	.44 ***	-.12	-.06	.01	.02	.23 *	.45 ***
CTP86	.16	.33 ***	.34 **	.43 ***	-.01	-.01	-.01	.03	.30 **	.39 ***
CTP87	.14	.37 ***	.36 **	.48 ***	-.07	.01	.05	.14	.28 **	.46 ***
CTP88	.16	.37 ***	.39 **	.53 ***	-.12	-	.06	.11	-	.53 ***
CTP89	.06	.37 ***	.31 **	.51 ***	-.16	-	.11	.24 *	-	.52 ***
CTP90	.05	.35 ***	.29 **	.48 ***	-.14	-	.11	.21 *	-	.49 ***
CTP91	.08	.31 **	.31 **	.43 ***	-.11	-	-.00	.12	-	.43 ***
CTP92	.10	.31 **	.32 ***	.45 ***	-.08	-	.00	.04	-	.41 ***
CTP93	.07	.35 ***	.34 ***	.46 ***	-.12	-	-.07	.06	-	.43 ***
CTP94	.11	.34 ***	.36 ***	.47 ***	-.10	-	-.01	.01	-	.42 ***

Summary:

1981-1986/1991-1994 Mean Correlation	.08	.27	.26	.38	-.12	.09	-.05	.00	.13	.39
Territorial Justice	0/14	10/14	11/14	12/14	0/14	6/6	10/10	10/10	2/6	1/14
Territorial Injustice	0/14	0/14	0/14	0/14	0/14	0/6	0/10	1/10	0/6	12/14
1987-1990 Mean						.01	.33	.17	.28	
Territorial Justice						0/1	0/4	2/4	1/1	
Territorial Injustice						0/1	0/4	0/4	1/1	

Note:

A number of correlations between CTP and NEXPP, TEACH and STAFF in this Table are underlined. This is because rule 4, instead of rule 3, applies to these correlations. Territorial justice requires a positive correlation.

Key:

Significance levels:

*	0.05 or better
**	0.01 or better
***	0.001 or better

Variables:

Breadth of Need:	
CTP 1981-1994	3 & 4 year olds per 1,000 population
Breadth of Provision:	
FPC 1981-1994	Full-time places per 1,000 3 & 4 year olds
PPC 1981-1994	Part-time places per 1,000 3 & 4 year olds
PC 1981-1994	Total places per 1,000 3 & 4 year olds 1981-1994
NSACL 1981-1994	Nursery school and class places per 1,000 3 and 4 year olds
INF 1981-1994	Infant class places per 1,000 3 & 4 year olds
Depth of Provision:	
NEXPP 1981-1987	Net expenditure in nursery schools per pupil
TEACH 1981-1994	Teachers per 1,000 pupils in nursery schools and classes 1981-1994
STAFF 1981-1994	Total staff per 1,000 pupils in nursery schools and classes 1981-1994 (includes non-teaching staff)
Total Provision:	
NEXTC 1981-1987	Net expenditure in nursery schools per 3 and 4 year old
Quality of Provision:	
QUALP 1981-1994	% of all places provided in nursery schools and classes

The correlations presented in Table 5.11 indicate some evidence of territorial justice in nursery education. Taking first the breadth of nursery education provision, a positive correlation is indicative of territorial justice since corresponding dimensions of need and provision are compared. The correlation between children per 1,000 population and full-time places (FPC) is insignificant. In contrast, the provision of part-time places (PPC) is positive and significant between 1984 and 1994, indicating territorial justice. Total places (PC) are also positively correlated with the child population between 1984 and 1994. In addition, the correlations between the child population and nursery school and class places per 1,000 children (NSACL) are also positive between 1983 and 1994 and therefore represent evidence of territorial justice. The relationship between CTP and INF is negative, although not significant.

In terms of the breadth of service provision, these correlations provide some evidence of territorial justice. The mean correlation between the breadth of need and part-time places is .27. This provides evidence of weak territorial justice overall. The mean correlation between the child population and places per 1,000 children (PC) is also indicative of weak territorial justice. In contrast, the mean correlations for nursery school and class provision provide evidence of moderate territorial justice. The correlations between the breadth of need and both full-time places and infant class places are not significant. These correlations, therefore, are indicative of neither territorial justice nor injustice. This is also the case between 1981-1982 for all indicators of provision, since none of the correlations are significant.

The correlations between the breadth of need and the breadth of provision indicate evidence of weak or moderate territorial justice. Of the 70 correlations between the breadth of need and the breadth of provision, 34 of these support territorial justice at either the weak or moderate level. On the basis that corresponding dimensions of need and provision are compared, these correlations provide the most robust evidence of territorial justice in nursery education. None of the correlations provide evidence of territorial injustice.

Moving on to the correlation between the breadth of need and depth of provision, territorial justice requires an insignificant correlation for all years, except between 1987 and 1990, when a positive correlation is necessary. A positive correlation between the breadth of need and the depth of provision is required for territorial justice between 1987 and 1990 to reflect the strongly positive relationship between the breadth and depth of need in these years. In Table 5.11, where positive correlations are required for territorial justice, these coefficients are underlined. In all other years, an insignificant correlation is required for territorial justice since the

correlation between the breadth and depth of need is not strong. From Table 5.11, it can be seen that the correlations between the breadth of need and depth of provision in 1981-1986 and 1991-1994 are insignificant. This is what territorial justice requires. Between 1987 and 1990, the correlations are also insignificant, with the exception of the positive relationship between CTP and STAFF in 1989 and 1990. As territorial justice requires a positive relationship, these insignificant correlations are not indicative of justice. Territorial justice therefore exists between CTP and STAFF in 1989 and 1990. The strength of the correlations indicate weak territorial justice in these years. However, the mean correlation of .17 is lower than that required for weak territorial justice.

Overall, the correlation between the breadth of need and depth of provision matches the requirements for territorial justice. Of the 35 correlations, between CTP and NEXPP, TEACH and STAFF, 28 suggest territorial justice. In the majority of these (26), the correlation required for territorial justice was insignificant so it is not possible to determine the level of territorial justice. In relation to the correlation of .24* between CTP89 and STAFF89 and .21* between CTP90 and STAFF90, these are indicative of weak territorial justice.

The correlation between the breadth of need (CTP) and total provision (NEXTC) should be positive for territorial justice. Rule 3 on territorial justice applies to the correlations between 1981 and 1986 and rule 4 to 1987. The correlations are significantly positive in three of the seven years. However, the mean correlation in the 1981-1986 period is .13. This is below that required for weak territorial justice. The relationship between breadth of need and the total dimension of nursery education provides evidence of weak territorial justice in some years. Weak territorial justice exists in 1987.

The correlation between the breadth of need and quality of provision is also presented in Table 5.11. Territorial justice requires that this relationship is insignificant since quality of service should not vary with the level of need. The correlations indicate a significant positive relationship in 13 of the 14 years under review. The correlations increased from the early 1980s to the mid-1980s and began to decrease in the later years. The positive relationship between need and quality means that as the number of children increased, a greater proportion of all places were provided in quality nursery settings. Since quality should not vary with need, the correlations between the breadth of need and quality of nursery provision are indicative of territorial injustice. The mean correlation of .39 suggests moderate territorial injustice.

In sum, there is weak territorial justice in the provision of nursery places overall and in part-time places. The correlation between the breadth of need and expenditure per child also provides some evidence of weak territorial justice. There is moderate territorial justice between the breadth of need and nursery places offered within nursery school and class settings. The insignificant relationship between the child population and expenditure per pupil, teachers per 1,000 pupils and staff per 1,000 pupils are also indicative of territorial justice. The positive correlation between the breadth of need and quality of service is indicative of moderate territorial injustice.

This section of the Chapter has focused on the correlation between the breadth of need and the provision of nursery education. The correlation of corresponding indicators of need and provision provides the most robust evidence on territorial justice. A summary of the correlation between the breadth of need and the breadth of provision is presented in Table 5.12. As indicated, weak or moderate territorial justice exists in 48% of the correlations. There is no evidence of strong territorial

justice, nor injustice. Overall, some evidence of territorial justice has been found between the breadth of need for nursery education and the breadth of provision.

Table 5.12: Summary of the Correlation Between the Breadth of Need and the Breadth of Provision 1981-1994

		Number of Correlations Between the Breadth of Need and the Breadth of provision n=70
Territorial Justice	Weak	5
	Moderate	29

A further summary of the evidence on territorial justice between the breadth of need and service provision is presented in Table 5.13. The summary Table focuses on the extent of territorial justice in the quantity and quality of nursery education provision.

Table 5.13: Summary of Correlation between the Breadth of Need and Nursery Education Provision 1981-1994

		Quantity of Provision n=112	Quality of Provision n=14
Territorial Justice	W	9	0
	M	30	0
	Insig.	26	1
Total		65	1
Territorial Injustice	W	0	2
	M	0	11
Total		0	13

The correlations provide some evidence of territorial justice in nursery education in the period 1981-1994. Of the 126 correlations which have been examined, 65 of these support territorial justice in terms of the quantity of nursery provision. There is little evidence of territorial injustice in the quantity of provision. In the majority of the correlations between the breadth of need and the quality of service provision, there is moderate territorial injustice. Overall, there is some evidence of territorial justice between the breadth of need and the quantity, but not the quality of service provision.

B. The Correlation Between the Depth of Need and Nursery Education Provision

The Chapter now moves on to examine the relationship between the depth dimension of need and nursery education provision. The depth of need is represented by each of these indicators separately (CLASS, NLONE, NLGE, NPPR, NNCAR and NNCW), and the index of disadvantage (NDS) which incorporates a range of need circumstances.

Tables 5.14 - 5.19 present the correlations between each of the individual measurers of the depth of need and the provision of nursery education. Territorial justice requires an insignificant correlation between the depth of need and the breadth of provision (rule 2), a positive correlation between the depth of need and both depth and total provision (rules 1 and 3 respectively) and an insignificant correlation between the depth of need and quality of service (rule 7). Table 5.14 presents the correlations between the depth of need, represented by Social Classes IV and V (CLASS) and nursery provision. An insignificant correlation is required for territorial justice between Social Classes IV and V and the breadth of provision. The correlations between CLASS and FPC, PPC, PC, NSACL and INF are all positive, with the exception of INF in 1992 and 1993. Positive correlations between the depth of need and the breadth of nursery education are indicative of territorial injustice in

this context because the breadth and depth of need are not strongly correlated. The correlations are indicative of weak or moderate territorial injustice.

Table 5.14: Correlations Between the Depth of Need (Social Classes IV and V) for Nursery Education and Nursery Education Provision in England and Wales 1981-1994

	[Breadth of Provision 1981-1994]					[Depth of Provision]			[Total Provision]	[Quality of Provision]
	FPC	PPC	PC	NSACL	INF	NEXPP	TEACH	STAFF	NEXTC	QUALP
CLASS81	*** .53	* .21	*** .51	*** .49	** .29	.20	-.05	.01	** .35	* .21
CLASS82	*** .50	* .26	*** .52	*** .50	* .24	* .27	-.06	.04	** .35	** .26
CLASS83	*** .48	** .30	*** .53	*** .50	* .22	.15	-.10	.04	** .35	* .25
CLASS84	*** .52	** .32	*** .56	*** .52	** .30	.14	-.08	-.03	** .34	* .23
CLASS85	*** .51	** .34	*** .58	*** .53	** .29	.08	-.07	.02	* .31	* .23
CLASS86	*** .52	*** .37	*** .61	*** .55	** .32	.05	-.12	.05	* .31	* .20
CLASS87	*** .51	*** .36	*** .59	*** .54	** .30	.13	-.12	.05	* .27	* .24
CLASS88	*** .47	*** .37	*** .59	*** .54	** .26	-	-.16	.04	-	* .21
CLASS89	*** .42	*** .34	*** .56	*** .52	** .26	-	-.11	.05	-	.15
CLASS90	*** .42	*** .36	*** .57	*** .51	** .31	-	-.16	.03	-	* .22
CLASS91	*** .42	** .26	*** .50	*** .46	* .20	-	-.17	-.00	-	* .23
CLASS91	*** .40	** .26	*** .48	*** .46	.16	-	-.19	-.01	-	** .24
CLASS91	*** .41	** .28	*** 51	*** .48	.17	-	* -.23	-.03	-	* .21
CLASS91	*** .42	** .27	*** .52	*** .47	* .21	-	-.17	-.00	-	* .21
Summary:										
Mean	.46	.30	.54	.50	.25	.14	.12	.01	.32	.22
Territorial Justice	0/14	0/14	0/14	0/14	2/14	1/7	0/14	0/14	7/7	1/14
Territorial Injustice	14/14	14/14	14/14	14/14	12/14	0/7	1/14	0/14	0/7	13/14

Key:

Significance levels:

*	0.05 or better
**	0.01 or better
***	0.001 or better

Variables:

Depth of Need:

CLASS	% of all households with children aged under 16 where head of households is in Social Classes IV and V 1981 % of economically active heads of household in Social Classes IV and Vwith children aged -15 years 1991

Breadth of Provision:

FPC 1981-1994	Full-time places per 1,000 3 & 4 year olds
PPC 1981-1994	Part-time places per 1,000 3 & 4 year olds
PC 1981-1994	Total places per 1,000 3 & 4 year olds 1981-1994
NSACL 1981-1994	Nursery school and class places per 1,000 3 and 4 year olds
INF 1981-1994	Infant class places per 1,000 3 & 4 year olds

Depth of Provision:

NEXPP 1981-1987	Net expenditure in nursery schools per pupil
TEACH 1981-1994	Teachers per 1,000 pupils in nursery schools and classes 1981-1994
STAFF 1981-1994	Total staff per 1,000 pupils in nursery schools and classes 1981-1994 (includes non-teaching staff)

Total Provision:

NEXTC 1981-1987	Net expenditure in nursery schools per 3 and 4 year old

Quality of Provision:

QUALP 1981-1994	% of all places provided in nursery schools and classes

Territorial justice requires a positive correlation between the depth of need and the depth of provision since these dimensions are corresponding. Some evidence of territorial justice is therefore provided by the positive correlation between CLASS and NEXPP in 1982. The correlation, however, is not significant in other years. The correlation between CLASS and TEACH is insignificant between 1981 and 1992 and in 1994 and significantly negative in 1993. The negative correlation provides evidence of weak territorial injustice since increases in the depth of need are negatively associated with increases in the depth of provision. However, this correlation is only obtained in 1993 and therefore is not representative of the whole period where the relationship is insignificant. The relationship between CLASS and STAFF is also significantly negative, although the correlations are not significant. The correlation between corresponding dimensions of need and provision provides

some very limited evidence of weak territorial justice and injustice in nursery education.

The depth of need (CLASS) and total provision (NEXTC) are positively correlated in Table 5.14. The mean correlation of .32 is indicative of moderate territorial justice. In the 1981-1987 period, the correlation is decreasing and is below moderate territorial justice in 1987.

The correlation between the depth of need and quality of provision is positive. As territorial justice requires an insignificant correlation, this provides evidence of territorial injustice. The mean correlation is .22 which indicates evidence of weak injustice.

The correlation between Social Classes IV and V and nursery education provision provides evidence of both territorial justice and injustice. The relationship between need and expenditure per child is indicative of moderate territorial justice. Evidence of weak territorial injustice is provided by the significant negative correlation between the depth of need and TEACH in 1993. The positive correlations between the depth of need and the breadth of provision also indicate territorial injustice at weak or moderate levels. Weak territorial injustice is also evident between need and the quality of service. Of the 226 correlations presented in Table 5.14, only 10 of these support territorial justice. A total of 83 are indicative of territorial injustice. The majority of these are at the moderate level. Overall, the relationship between need, represented by Social Classes IV and V and nursery education provision displays evidence of moderate territorial injustice.

The correlation between lone parent households with children aged 0-4 (NLONE) and nursery education provision is presented in Table 5.15. The positive correlations between the depth of need and breadth of nursery provision are indicative of territorial injustice since an insignificant correlation is required for justice. Of all these correlations, the only insignificant relationship is between NLONE and INF between 1991 and 1994. However, the mean correlation between these indicators of need is positive across the whole period. The mean correlations relating to all of the measures of provision are indicative of weak or moderate territorial injustice.

Table 5.15: Correlations Between the Depth of Need (Lone Parents) for Nursery Education and Nursery Education Provision in England and Wales 1981-1994

	[Breadth of Provision 1981-1994]					[Depth of Provision]			[Total Provision]	[Quality of Provision]
	FPC	PPC	PC	NSACL	INF	NEXPP	TEACH	STAFF	NEXTC	QUALP
NLONE81	*** .53	** .26	*** .54	*** .52	* .32	** .35	* .22	* .20	** .35	* .21
NLONE82	*** .55	** .31	*** .59	*** .54	* .33	** .32	* .22	* .23	** .36	* .24
NLONE83	*** .56	*** .35	*** .62	*** .56	* .33	** .35	.15	.17	*** .41	* .24
NLONE84	*** .58	*** .38	*** .64	*** .58	*** .36	*** .43	.16	.12	*** .43	* .24
NLONE85	*** .55	*** .37	*** .63	*** .58	* .31	** .34	.17	.18	*** .42	* .26
NLONE86	*** .57	*** .40	*** .67	*** .60	*** .35	** .34	* .20	* .24	** .38	* .25
NLONE87	*** .55	*** .40	*** .65	*** .59	** .33	** .35	.14	* .21	*** .44	* .24
NLONE88	*** .54	*** .41	*** .67	*** .62	** .28	-	.11	* .22	-	** .29
NLONE89	*** .36	*** .41	*** .57	*** .59	.18	-	.12	* .22	-	** .30
NLONE90	*** .37	*** .44	** .59	*** .61	* .27	-	.05	.14	-	** .29
NLONE91	*** .38	* .22	*** .44	*** .52	-.01	-	* .22	** .24	-	*** .42
NLONE91	*** .33	** .25	** .43	*** .53	-.10	-	* .22	.18	-	*** .46
NLONE91	*** .38	* .23	** 45	*** .55	-.05	-	.16	.15	-	*** .45
NLONE91	*** .40	* .22	*** .47	*** .55	-.03	-	.14	* .19	-	*** 43
Summary:										
Mean	.47	.33	.56	.56	.20	.35	.16	.19	.39	.30
Territorial Justice	0/14	0/14	0/14	0/14	5/14	7/7	5/14	8/14	7/7	0/14
Territorial Injustice	14/14	14/14	14/14	14/14	9/14	0/7	0/14	0/14	0/7	14/14

Key:

Significance levels:

*	0.05 or better
**	0.01 or better
***	0.001 or better

Variables:

Depth of Need:

NLONE	% of households with children aged 0-4 years which are headed by a lone adult 1981, 1991

Breadth of Provision:

FPC 1981-1994	Full-time places per 1,000 3 & 4 year olds
PPC 1981-1994	Part-time places per 1,000 3 & 4 year olds
PC 1981-1994	Total places per 1,000 3 & 4 year olds 1981-1994
NSACL 1981-1994	Nursery school and class places per 1,000 3 and 4 year olds
INF 1981-1994	Infant class places per 1,000 3 & 4 year olds

Depth of Provision:

NEXPP 1981-1987	Net expenditure in nursery schools per pupil
TEACH 1981-1994	Teachers per 1,000 pupils in nursery schools and classes 1981-1994
STAFF 1981-1994	Total staff per 1,000 pupils in nursery schools and classes 1981-1994 (includes non-teaching staff)

Total Provision:

NEXTC 1981-1987	Net expenditure in nursery schools per 3 and 4 year old

Quality of Provision:

QUALP 1981-1994	% of all places provided in nursery schools and classes

Some evidence of territorial justice is provided by the correlations between NLONE and NEXPP, TEACH and STAFF. These indicators of need and provision are corresponding dimensions of need and provision. The positive correlation between NLONE and NEXPP is indicative of moderate territorial justice. The correlations between NLONE and both TEACH and STAFF are positive in some of the years (1981, 1982, 1986 and 1991). STAFF is also positively correlated with NLONE in 1988, 1989 and 1994. These correlations are indicative of weak territorial justice in these years. The mean correlation between NLONE and STAFF is indicative of weak territorial justice. The correlation between the depth of need and depth of provision indicates weak and moderate territorial justice overall.

Territorial justice requires a positive correlation between the depth of need and total provision (NEXTC). The correlations, which are positive and significant, provide evidence of moderate territorial justice.

The correlation between the depth of need and quality of service is indicative of territorial injustice since an insignificant relationship is required for justice. The positive correlation between these indicators means that increases in the depth of need are positively related to quality of service. The mean correlation indicates moderate territorial injustice across the whole period. In the period 1981 and 1989, the correlations indicate weak territorial injustice.

Overall, the correlations between lone parent families and nursery education provision presented in Table 5.15 indicate more evidence of territorial justice in the depth and total dimensions of service than in either the breadth or the quality of provision. Of 32 correlations which indicate territorial justice in Table 5.15, 27 of these are between the depth of need and the depth and total dimensions of nursery provision. The relationship between the depth of need and expenditure per pupil is indicative of moderate territorial justice. Weak territorial justice exists between the depth of need and total staff. The correlation between need and expenditure per child provides evidence of moderate territorial justice. In terms of the relationship between the depth of need and breadth of provision, the correlations provide evidence of mainly moderate territorial injustice.

Table 5.16 presents the correlation between large families and nursery education provision. The correlations presented in this Table are markedly different from those in other Tables because they are mainly negative. Some of the correlations are strongly negative, for example, the correlation between NLGE88 and PC88 is -.77.

In terms of the implications of the negative correlations for territorial justice, the requirements of justice are insignificant correlations between the depth of need and provision; positive correlations between the depth of need and the depth of provision and total provision; and insignificant correlations between the depth of need and quality of service. The negative correlations between the depth of need and breadth of nursery education provision are indicative of territorial injustice. The mean correlations suggest weak territorial injustice between the depth of need and infant classes, moderate territorial injustice between the depth of need and both full-time places and part-time places, and strong territorial injustice between need and both total places and nursery school and class places.

Table 5.16: Correlations Between the Depth of Need (Large Families) for Nursery Education and Nursery Education Provision in England and Wales 1981-1994

	[Breadth of Provision				1981-1994]	[Depth of Provision			[Total Provision]	[Quality of Provision]
	FPC	PPC	PC	NSACL	INF	NEXPP	TEACH	STAFF	NEXTC	QUALP
NLGE81	*** -.55	*** -.46	*** -.69	*** -.61	**** -.48	-.19	-.19	* -.22	** -.36	* -.20
NLGE82	*** -.51	*** -.48	*** -.70	*** -.63	*** -.39	** -.28	-.17	* -.22	** -.37	** -.30
NLGE83	*** -.53	*** -.52	*** -.73	*** -.66	*** -.38	-.15	-.08	-.16	** -.38	** -.31
NLGE84	*** -.54	*** -.52	*** -.73	*** -.67	*** -.40	* -.26	-.05	-.12	*** -.41	** -.32
NLGE85	*** -.52	*** -.52	*** -.73	*** -.67	*** -.35	-.16	-.10	-.13	*** -.42	** -.32
NLGE86	*** -.56	*** -.53	*** -.76	*** -.68	*** -.40	* -.24	-.13	* -.21	*** -.42	** -.32
NLGE87	*** -.56	*** -.54	*** -.75	*** -.68	*** -.38	** -.28	-.04	* -.21	*** -.45	** -.31
NLGE88	*** -.55	*** -.53	*** -.77	*** -.70	** -.34	-	-.02	-.19	-	*** -.35
NLGE89	*** -.43	*** -.50	*** -.68	*** -.68	** -.27	-	-.06	* -.22	-	*** -.36
NLGE90	*** -.43	*** -.50	*** -.68	*** -.66	** -.29	-	.01	-.14	-	*** -.33
NLGE91	*** -.49	*** -.30	*** -.59	*** -.61	-.11	-	-.12	* -.22	-	*** -.45
NLGE91	*** -.46	*** -.34	*** -.59	*** -.63	-.06	-	* -.19	* -.21	-	*** -.49
NLGE91	*** -.51	*** -.35	*** -.63	*** -.66	-.10	-	-.07	-.17	-	*** -.49
NLGE91	*** -.52	*** -.33	*** -.64	*** -.66	-.11	-	-.09	* -.21	-	*** -.47
Summary:										
Mean	-.51	-.45	-.69	-.65	-.29	-.22	-.08	-.18	-.40	-.35
Territorial Justice	0/14	0/14	0/14	0/14	4/14	0/7	0/14	0/14	7/7	0/14
Territorial Injustice	14/14	14/14	14/14	14/14	10/14	4/7	1/14	8/14	0/7	14/14

Key:

Significance levels:

*	0.05 or better
**	0.01 or better
***	0.001 or better

Variables:

Depth of Need:

NLGE	% of households with children aged 0-4 years which have 2 or more dependent children 1981 and 1991

Breadth of Provision:

FPC 1981-1994	Full-time places per 1,000 3 & 4 year olds
PPC 1981-1994	Part-time places per 1,000 3 & 4 year olds
PC 1981-1994	Total places per 1,000 3 & 4 year olds 1981-1994
NSACL 1981-1994	Nursery school and class places per 1,000 3 and 4 year olds
INF 1981-1994	Infant class places per 1,000 3 & 4 year olds

Depth of Provision:

NEXPP 1981-1987	Net expenditure in nursery schools per pupil
TEACH 1981-1994	Teachers per 1,000 pupils in nursery schools and classes 1981-1994
STAFF 1981-1994	Total staff per 1,000 pupils in nursery schools and classes 1981-1994 (includes non-teaching staff)

Total Provision:

NEXTC 1981-1987	Net expenditure in nursery schools per 3 and 4 year old

Quality of Provision:

QUALP 1981-1994	% of all places provided in nursery schools and classes

Weak territorial injustice is evident between the depth of need and NEXPP. Since these are corresponding dimensions of need and provision, a positive correlation is required for justice. The correlation between NLGE and both TEACH and STAFF is also negative, but not significantly negative across the whole period. The mean correlation between NLGE and STAFF is -.18. This is not significant. Of the 35 correlations between the depth of need and the depth of provision, 12 of these indicate weak territorial injustice. No evidence of territorial justice exists between these indicators.

The negative correlation between NLGE and NEXTC is indicative of moderate territorial injustice. The strength of the correlation increased between 1981 and 1987.

Moderate territorial injustice is also evident in the negative correlation between NLGE and QUALP. The correlation is significant throughout the whole period.

The correlations presented in Table 5.16 provide evidence of territorial injustice in every dimension of nursery provision. Increases in the depth of need are associated with less breadth of provision, less depth of provision and less total provision. The negative correlations between the depth of need and quality of provision mean that greater need is met with less quality of service. As quality should not be correlated with need, this represents territorial injustice.

Territorial justice is more evident in the correlations between overcrowding (NPPR) and nursery provision presented in Table 5.17. Whilst the correlation between the depth of need and breadth of provision is positive for most indicators between 1981 and 1989, the relationship is generally insignificant between 1990 and 1994. The insignificant correlations between NPPR and FPC, PPC and PC in these years are therefore indicative of territorial justice. The correlation between NPPR and INF is positive in 1981, 1982 and 1984 and negative between 1991 and 1994. Since territorial justice requires an insignificant correlation, all of these are indicative of territorial injustice. Those between need and FPC indicate weak territorial injustice and those between need and PPC, PC, and NSACL represent moderate territorial injustice. The correlation between NPPR and INF is insignificant between 1985 and 1990. In general, the correlations between the depth of need, represented by overcrowded households, and the breadth of provision are indicative of territorial injustice. More specifically, of the 70 correlations between the depth of need and breadth of provision, 48 of these indicate territorial injustice. Over 70% of these indicate moderate or strong territorial injustice.

Table 5.17: Correlations Between the Depth of Need (Overcrowding) for Nursery Education and Nursery Education Provision in England and Wales 1981-1994

	[Breadth of Provision 1981-1994]					[Depth of Provision]			[Total Provision]	[Quality of Provision]
	FPC	PPC	PC	NSACL	INF	NEXPP	TEACH	STAFF	NEXTC	QUALP
NPPR81	*** .43	*** .44	*** .60	*** .62	** .29	* .24	.16	* .25	*** .43	** 31
NPPR82	*** .41	*** .49	*** .64	*** .66	* .22	* .23	.14	* .23	*** .42	*** .39
NPPR83	*** .36	*** .52	*** .61	*** .65	.16	.20	.04	.16	*** .47	*** .40
NPPR84	*** .36	*** .53	*** .62	*** .64	* .22	* .26	.08	.13	*** .46	*** .38
NPPR85	** .30	*** .49	*** .56	*** .59	.14	.14	.16	* .20	*** .40	*** .37
NPPR86	* .27	*** .48	*** .53	*** .57	.13	.16	.19	* .22	*** .41	*** .36
NPPR87	* .22	*** .40	*** .44	*** .48	.09	.19	.10	* .21	** .35	** .31
NPPR88	.18	*** .39	*** .42	*** .47	.04	-	.11	* .22	-	** .33
NPPR89	-.01	*** .32	* .22	*** .34	-.08	-	.12	* .20	-	** .30
NPPR90	-.04	** .27	.16	** .27	-.07	-	.08	.15	-	* .24
NPPR91	.09	.05	.11	* .26	* -.23	-	.16	** .26	-	*** .34
NPPR91	.04	.13	.13	** .29	*** -.32	-	.15	* .22	-	*** .39
NPPR91	.10	.09	15	** .32	** -.26	-	* .24	* .23	-	*** .37
NPPR91	* .20	.06	* .19	** .31	-.16	-	** .26	** .28	-	*** .33
Summary:										
Mean	.20	.33	.38	.46	.01	.20	.14	.20	.42	.34
Territorial Justice	6/14	4/14	4/14	0/14	8/14	3/7	2/14	11/14	7/7	0/14
Territorial Injustice	8/14	10/14	10/14	14/14	6/14	0/7	0/14	0/14	0/7	14/14

Key:

Significance levels:

*	0.05 or better
**	0.01 or better
***	0.001 or better

Variables:

Depth of Need:

NPPR	% of children aged 0-4 years in households with one or more persons per room 1981, % of households with children aged 0-4 years with one or more persons per room 1991

Breadth of Provision:

FPC 1981-1994	Full-time places per 1,000 3 & 4 year olds
PPC 1981-1994	Part-time places per 1,000 3 & 4 year olds
PC 1981-1994	Total places per 1,000 3 & 4 year olds 1981-1994
NSACL 1981-1994	Nursery school and class places per 1,000 3 and 4 year olds
INF 1981-1994	Infant class places per 1,000 3 & 4 year olds

Depth of Provision:

NEXPP 1981-1987	Net expenditure in nursery schools per pupil
TEACH 1981-1994	Teachers per 1,000 pupils in nursery schools and classes 1981-1994
STAFF 1981-1994	Total staff per 1,000 pupils in nursery schools and classes 1981-1994 (includes non-teaching staff)

Total Provision:

NEXTC 1981-1987	Net expenditure in nursery schools per 3 and 4 year old

Quality of Provision:

QUALP 1981-1994	% of all places provided in nursery schools and classes

The correlation between the depth of need and depth of provision (NEXPP, TEACH and STAFF) is positive in some of the years. The mean correlations indicate weak territorial justice between the depth of need and both NEXPP and STAFF. Whilst the mean correlation of .20 is the same for both indicators, NPPR is positively correlated with STAFF in 11 of the 14 years and with NEXPP in 3 of the 7 years under review. It may be deduced that overcrowding is more positively correlated with STAFF than with NEXPP. Consequently, territorial justice is therefore more evident in the provision of staff resources than either teaching resources or expenditure per pupil. Overall, the correlations indicate weak territorial justice between the depth of need and the depth of provision.

Territorial justice requires a positive correlation between NPPR and NEXTC. The mean correlation between these measures is indicative of moderate territorial justice. Increases in the depth of need are met with additional resources per child.

Territorial injustice is evident in the positive correlation between NPPR and QUALP. The positive correlation means that increases in the depth of need are met with a higher proportion of quality of service. The mean correlation indicates moderate territorial injustice between the depth of need and quality of service.

The correlations presented in Table 5.17 provide some evidence of territorial justice in the breadth, depth and total dimensions of nursery education provision. There is moderate territorial justice between need and total provision (NEXTC) and weak territorial justice in the depth of provision. The insignificant correlations between the depth of need and the breadth of provision provide some evidence of territorial justice. The strength of the justice associated with insignificant correlations cannot be determined. There is also evidence of territorial injustice between the depth of need and breadth of provision. Overall, these correlations indicate moderate territorial injustice. There is also moderate territorial injustice in the quality of service provision.

Table 5.18 presents the correlations between no car (NNCAR) and nursery provision. NNCAR has been included in this study as a measure of low income. The correlations required for territorial justice between this indicator of the depth of need and provision are the same as those for other indicators of the depth of need above: an insignificant correlation between the depth of need and the breadth of provision; a positive correlation between the depth of need and the depth of provision; a positive correlation between need and total provision; and an insignificant correlation between need and quality of service.

Table 5.18: Correlations Between the Depth of Need (No Car) for Nursery Education and Nursery Education Provision in England and Wales 1981-1994

	[Breadth of Provision 1981-1994]					[Depth of Provision]			[Total Provision]	[Quality of Provision]
	FPC	PPC	PC	NSACL	INF	NEXPP	TEACH	STAFF	NEXTC	QUALP
NNCAR81	*** .69	*** .39	*** .78	*** .69	*** .46	* .25	.08	.17	*** .45	** .27
NNCAR82	*** .63	*** .43	*** .74	*** .68	*** .39	** .36	.06	.17	*** .44	*** .35
NNCAR83	*** .62	*** .48	*** .75	*** .68	*** .37	.21	.03	.16	*** .43	** .34
NNCAR84	*** .63	*** .49	*** .76	*** .70	*** .42	** .30	.00	.16	*** .44	** .33
NNCAR85	*** .60	*** .51	*** .76	*** .70	*** .37	.19	.06	.14	*** .42	** .34
NNCAR86	*** .63	*** .54	*** .80	*** .72	*** .43	* .22	.06	.18	** .38	** .33
NNCAR87	*** .60	*** .55	*** .79	*** .72	*** .39	** .30	.00	.17	*** .46	** .32
NNCAR88	*** .57	*** .55	*** .79	*** .73	** .34	-	-.02	.13	-	*** .36
NNCAR89	*** .40	*** .53	*** .70	*** .70	* .23	-	.01	.17	-	*** .37
NNCAR90	*** .41	*** .55	*** .60	*** .70	** .27	-	-.03	.10	-	*** .34
NNCAR91	*** .47	*** .33	*** .57	*** .64	.09	-	.12	.19	-	*** .46
NNCAR91	*** .42	*** .35	*** .62	*** .65	-.01	-	.17	.14	-	*** .51
NNCAR91	*** .47	*** .36	*** 64	*** .68	.03	-	.06	.12	-	*** .51
NNCAR91	*** .49	*** .34	*** .64	*** .68	.07	-	.06	.16	-	*** .48
Summary:										
Mean	.54	.45	.71	.69	.27	.26	.04	.15	.43	.37
Territorial Justice	0/14	0/14	0/14	0/14	4/14	5/7	0/14	0/14	7/7	0/14
Territorial Injustice	14/14	14/14	14/14	14/14	10/14	0/7	0/14	0/14	0/7	14/14

Key:

Significance levels:

*	0.05 or better
**	0.01 or better
***	0.001 or better

Variables:

Depth of Need:

NNCAR	% of children aged 0-4 in households which have no car 1981, % of households with childdren aged 0-4 years which have no car 1991

Breadth of Provision:

FPC 1981-1994	Full-time places per 1,000 3 & 4 year olds
PPC 1981-1994	Part-time places per 1,000 3 & 4 year olds
PC 1981-1994	Total places per 1,000 3 & 4 year olds 1981-1994
NSACL 1981-1994	Nursery school and class places per 1,000 3 and 4 year olds
INF 1981-1994	Infant class places per 1,000 3 & 4 year olds

Depth of Provision:

NEXPP 1981-1987	Net expenditure in nursery schools per pupil
TEACH 1981-1994	Teachers per 1,000 pupils in nursery schools and classes 1981-1994
STAFF 1981-1994	Total staff per 1,000 pupils in nursery schools and classes 1981-1994 (includes non-teaching staff)

Total Provision:

NEXTC 1981-1987	Net expenditure in nursery schools per 3 and 4 year old

Quality of Provision:

QUALP 1981-1994	% of all places provided in nursery schools and classes

In general, the correlation between NNCAR and each of the breadth indicators of service provision is positive across the period. An insignificant correlation between these dimensions is required for territorial justice. The correlations support weak territorial injustice in infant class provision, moderate injustice in full-time and part-time places and strong injustice nursery school and class provision and total places. Of the 70 correlations between the depth of need (NNCAR) and nursery education provision, 66 indicate territorial injustice. All but 2of these provide moderate or strong territorial injustice. The insignificant correlations between NNCAR and INF between 1981 and 1990 provide the only evidence of territorial justice between no car and the breadth of provision.

Territorial justice requires a positive correlation between the depth of need and the depth of provision. The significant positive correlation between NNCAR and NEXPP

in some years provides evidence of weak or moderate territorial justice. The correlations between NNCAR and both of the staffing indicators are insignificant.

The positive relationship between NNCAR and NEXTC indicates that moderate territorial justice exists between the depth of need and total provision. The strength of the correlation is moderate throughout the period.

The quality of nursery education is positively correlated with the depth of need. The strength of the correlation is indicative of moderate territorial injustice.

The correlations presented in Table 5.18 provide limited evidence of territorial justice in the provision of nursery education. There is moderate territorial justice between the depth of need and total provision (NEXTC) and weak justice between the depth of need and the depth of provision (NEXPP). In addition, the 4 insignificant correlations between NNCAR and INF provide evidence of territorial justice. However, the bulk of the evidence indicates moderate or strong territorial injustice. More specifically, the positive correlations between the depth of need and the breadth of provision are indicative of some weak, together with moderate or strong territorial injustice. Moderate territorial injustice is also evident between the depth of need and quality of service.

The relationship between the ethnic population and nursery education provision is presented in Table 5.19. The correlations between the depth of need and a number of indicators of the breadth of provision (FPC, PPC, PC and INF) are insignificant. This is what territorial justice requires. Across the whole period, there is territorial justice in the provision of full-time places and total places. Weak territorial injustice exists in relation to part-time places and nursery school and class places. Of the 70

correlations between the depth of need and the breadth of provision, 37 are insignificant and therefore represent territorial justice and 33 indicate moderate or weak territorial injustice.

Table 5.19: Correlations Between the Depth of Need (Ethnic Population) for Nursery Education and Nursery Education Provision in England and Wales 1981-1994

	[Breadth of Provision 1981-1994]					[Depth of Provision]			[Total Provision]	[Quality of Provision]
	FPC	PPC	PC	NSACL	INF	NEXPP	TEACH	STAFF	NEXTC	QUALP
NNCW81	-.04	.34 **	.20 *	.31 **	-.05	.12	.16	.16	.18	.28 **
NNCW82	-.01	.36 **	.25 *	.36 ***	-.09	.08	.15	.16	.18	.32 **
NNCW83	-.03	.35 **	.24 *	.36 ***	-.12	.16	.06	.13	.29 **	.33 **
NNCW84	-.01	.34 **	.24 *	.35 ***	-.09	.21 *	.12	.13	.29 **	.32 **
NNCW85	-.03	.30 **	.19	.33 **	-.13	.15	.15	.12	.24 *	.32 **
NNCW86	-.03	.30 **	.19	.33 **	-.14	.25 *	.15	.10	.32 **	.32 **
NNCW87	-.04	.24 *	.15	28 **	-.15	.21 *	.15	.16	.24 *	.30 **
NNCW88	-.01	.23 *	.16	.30 **	-.17	-	.17	.20 *	-	.32 **
NNCW89	-.14	.19 *	.03	.23 *	-.25 **	-	.15	.22 *	-	.32 **
NNCW90	-.15	.16	.00	.20 *	-.26 **	-	.12	.20 *	-	.31 **
NNCW91	-.00	.06	.04	.25 **	-.34 ***	-	.21 *	.24 *	-	.40 ***
NNCW91	-.01	.13	.09	.28 **	-.34 ***	-	.20 *	.25 **	-	.42 ***
NNCW91	.05	.11	.13	.31 **	-.29 **	-	.23 *	.26 **	-	.40 ***
NNCW91	.11	.07	.14	.30 **	-.25 **	-	.29 **	.28 **	-	.38 ***
Summary:										
Mean	-.04	.22	.14	.29	-.19	.16	.16	.18	.24	.33
Territorial Justice	14/14	5/14	10/14	0/14	8/14	3/7	4/14	7/14	5/7	0/14
Territorial Injustice	0/14	9/14	4/14	14/14	6/14	0/7	0/14	0/14	0/7	14/14

Key:

Significance levels:

*	0.05 or better
**	0.01 or better
***	0.001 or better

Variables:

Depth of Need:

NNCW	% of children aged 0-4 years where household head is born in New Commonwaalth 1981
1991	% of all households with children aged 0-4 years where head is born in New Commonwealth

Breadth of Provision:

FPC 1981-1994	Full-time places per 1,000 3 & 4 year olds
PPC 1981-1994	Part-time places per 1,000 3 & 4 year olds
PC 1981-1994	Total places per 1,000 3 & 4 year olds 1981-1994
NSACL 1981-1994	Nursery school and class places per 1,000 3 and 4 year olds
INF 1981-1994	Infant class places per 1,000 3 & 4 year olds

Depth of Provision:

NEXPP 1981-1987	Net expenditure in nursery schools per pupil
TEACH 1981-1994	Teachers per 1,000 pupils in nursery schools and classes 1981-1994
STAFF 1981-1994	Total staff per 1,000 pupils in nursery schools and classes 1981-1994 (includes non-teaching staff)

Total Provision:

NEXTC 1981-1987	Net expenditure in nursery schools per 3 and 4 year old

Quality of Provision:

QUALP 1981-1994	% of all places provided in nursery schools and classes

Positive correlations exist between the depth of need and the indicators of the depth of provision in some of the years. NNCW is positively related to STAFF between 1988 and 1994. The correlations suggest weak territorial justice. NNCW is also positively correlated with TEACH between 1991 and 1994. The relationship between the depth of need and NEXPP is positive in some years. Overall, these correlations provide evidence of weak territorial justice. No evidence of territorial justice exists between these indicators.

The mean correlation between NNCW and NEXTC (.24) indicates evidence of weak territorial justice between the depth of need and total provision. Whilst the correlation was positive in 1981 and 1982, the coefficients were not significant.

The quality of service is positively correlated with need throughout the period. The strength of the correlation indicates moderate territorial injustice.

The correlation between the depth of need represented by the ethnic population and nursery education provision provides mixed evidence of territorial justice and territorial injustice. In terms of territorial justice, there is evidence of justice in the breadth, depth and total dimensions of service provision. Territorial justice exists between the depth of need and the breadth and quality of nursery services.

The final indicator of the depth of need is the index of need. Between 1981 and 1986 and 1991-1994 territorial justice requires an insignificant correlation between the depth of need and the breadth of provision (rule 2), a positive correlation between corresponding dimensions of need and provision (rule 1) and a positive correlation between the depth of need and total provision (rule 4). Between 1987 and 1990, a positive correlation is required for territorial justice between the index of need and the breadth and total dimensions of nursery provision (rule 4). This is because of the strongly positive correlation between the breadth and depth of need in these years. A positive correlation is also required between the corresponding dimensions of the depth of need and the depth of provision (rule 1). Finally an insignificant correlation is required for territorial justice between the depth of need and the quality of service provision (rule 7) throughout the whole period under review.

The correlations between NDS and nursery education provision presented in Table 5.20 indicate that the relationship between the depth of need and the breadth of provision is positive between 1981 and 1986 and 1991-1994. The majority of the correlations are significant. A positive correlation between the depth of need and the breadth of provision means that as the depth of need rises, more nursery places are

provided. This represents territorial injustice since depth of need should be insignificantly correlated with the breadth of provision. The mean correlations between need and FPC, PPC and PC provide evidence of moderate territorial justice. Strong territorial injustice exists between need and NSACL.

Table 5.20: Correlations Between Index of the Depth of Need for Nursery Education and Nursery Education Provision in England and Wales 1981-1994

	1981-1994 [Breadth of Provision]					[Depth of Provision]			[Total Provision]	[Quality of Provision]
	FPC	PPC	PC	NSACL	INF	NEXPP	TEACH	STAFF	NEXTC	QUALP
NDS81	*** .52	*** .44	*** .66	*** .70	** .31	* .27	.13	* .21	*** .45	*** .35
NDS82	*** .50	*** .50	*** .70	*** .72	* .25	** .27	.12	* .21	*** .44	*** .42
NDS83	*** .47	*** .53	*** .69	*** .72	* .22	* .25	.04	.18	*** .49	*** .43
NDS84	*** .50	*** .55	*** .72	*** .73	** .28	** .33	.06	.11	*** .49	*** .42
NDS85	*** .46	*** .54	*** .70	*** .71	* .22	** .30	.13	.18	* .45	*** .42
NDS86	*** .48	*** .56	*** .72	*** .72	* .25	* .27	.13	* .20	*** .46	*** .41
NDS87	*** .45	*** .54	*** .69	*** .70	* .22	* .28	.07	* .22	*** .42	*** .40
NDS88	*** .43	*** .54	*** .70	*** .72	.17	-	.05	* .22	-	*** .44
NDS89	* .23	*** .50	*** .54	*** .66	.05	-	.10	* .24	-	*** .44
NDS90	* .23	*** .51	*** .54	*** .64	.08	-	.03	.19	-	*** .41
NDS91	** .30	* .23	*** .40	*** .53	-.13	-	* .20	** .25	-	*** .50
NDS92	* .26	** .28	*** .40	*** .56	* -.21	-	.18	* .23	-	*** .55
NDS93	** .32	** .27	*** .45	*** .60	-.15	-	.15	* .21	-	*** .53
NDS94	*** .38	** .24	*** .47	*** .59	-.08	-	* .19	** .26	-	*** .49

Summary:

1981-1986/1991-1994										
Mean	.42	.41	.59	.65	.09	.28	.11	.20	.45	.44
Territorial Justice	0/10	0/10	0/10	0/10	3/10	7/7	2/14	10/14	6/6	0/14
Territorial Injustice	9/9	9/9	9/9	9/9	7/9	0/7	0/13	0/13	0/6	14/14
1987-1990										
Mean	.33	.52	.61	.68	.13				.42	
Territorial Justice	4/4	4/4	4/4	4/4	1/4				1/1	
Terriorial Injustice	0/4	0/4	0/4	0/4	0/4				0/1	

Note:

A number of correlations between NDS and FPC, PPC, PC, NSACL, INF and NEXTC in this Table are underlined. This is because rule 4, instead of rule 3, applies to these correlations. Territorial justice requires a positive correlation.

Key:

Significance levels:

*	0.05 or better
**	0.01 or better
***	0.001 or better

Variables:

Depth of Need:	
NDS1981-1994	index of the depth of need
Breadth of Provision:	
FPC 1981-1994	Full-time places per 1,000 3 & 4 year olds
PPC 1981-1994	Part-time places per 1,000 3 & 4 year olds
PC 1981-1994	Total places per 1,000 3 & 4 year olds 1981-1994
NSACL 1981-1994	Nursery school and class places per 1,000 3 and 4 year olds
INF 1981-1994	Infant class places per 1,000 3 & 4 year olds
Depth of Provision:	
NEXPP 1981-1987	Net expenditure in nursery schools per pupil
TEACH 1981-1994	Teachers per 1,000 pupils in nursery schools and classes 1981-1994
STAFF 1981-1994	Total staff per 1,000 pupils in nursery schools and classes 1981-1994 (includes non-teaching staff)
Total Provision:	
NEXTC 1981-1987	Net expenditure in nursery schools per 3 and 4 year old
Quality of Provision:	
QUALP 1981-1994	% of all places provided in nursery schools and classes

Between 1987 and 1990, a positive correlation is required for territorial justice. In these years, the correlation between NDS and FPC, PPC, NDS and PC and NDS and NSACL is positive. The positive correlations between NDS and both FPC and PPC are indicative of moderate territorial justice and the correlations between NDS and PC and NSACL may be classified as indicative of strong territorial justice.

In relation to the correlation between the depth of need and depth of nursery provision, as these are corresponding dimensions, territorial justice requires a positive correlation. The correlations between NDS and NEXPP are significantly positive in

all of the seven years. The mean correlation of .28 indicates weak territorial justice between these indicators of need and provision. The relationship between the depth of need and total staff is also positive and significant in ten of the fourteen years. The average correlation of .20 also suggests weak territorial justice. The correlations between the depth of need and teaching staff are only significant in 1991 and 1994. Over the 13 years, NDS and TEACH are not positively correlated. Thus the depth of provision, teaching staff, is not related to the depth of need. Since the correlations are not significantly negative, they do not represent evidence of territorial injustice.

Territorial justice requires the correlation between the depth of need (NDS) and total provision (NEXTC) to be significantly positive in the periods 1981-1986 and 1991-1994. Rule 3 is applied to determine territorial justice. Between 1987 and 1990, rule 4, which also requires a positive correlation, is appropriately applied. The correlations between these measures indicate that the relationship is positive and significant in all years for which data are available. Across the years 1980-1986, the mean correlation of .45 is indicative of moderate territorial justice.

Table 5.20 indicates that the quality of provision is positively correlated with the depth of need. The correlation is positive throughout the whole period. As territorial justice requires an insignificant correlation, the positive correlation is therefore indicative of territorial injustice. The mean correlation of .44 is indicative of moderate territorial injustice.

The correlations presented in Table 5.20 highlight that the relationship between the depth of need and depth of provision, represented by net expenditure per pupil (NEXPP) and total staff per 1,000 pupils (STAFF) is significantly positive. The strength of the correlations indicate weak territorial justice. The depth of need is not

positively related to depth of provision in terms of teaching staff. The correlations between the depth of need and breadth of provision are positive between 1981 and 1986 and 1991 and 1993. However, positive correlations in this context do not provide evidence of territorial justice - insignificant correlations are required for justice because the relationship between the breadth and depth of need was not strongly positive. On this basis, the correlations between the depth of need and the breadth of provision are indicative of moderate territorial injustice. Between 1987 and 1990, positive correlations are required for territorial justice between the depth of need and breadth of service provision since the correlation between the breadth and depth of need was strongly positive in these years. The correlations indicate moderate territorial justice between the depth of need and both full-time and part-time places and strong territorial justice between the depth of need and both total places and nursery school and class places. The correlations between the depth of need and total provision are indicative of moderate territorial justice. The quality of nursery education provision is positively correlated with the depth of need. Since territorial justice requires an insignificant correlation between the depth of need and quality, this provides evidence of territorial injustice at a moderate level.

Of the 126 correlations presented in Table 5.20, 47 of these provide evidence of territorial justice and 61 territorial injustice. Almost 50% of the 47 correlations supporting territorial justice are at the moderate or strong levels. In contrast, 81% of the correlations indicating territorial justice are also at the moderate level or above. Overall, the correlation between the index of the depth of need and nursery education provision indicates mixed evidence on the existence of territorial justice.

This section of the Chapter has been concerned with the correlation between the depth of need and nursery education provision. In general, the correlation between

the depth of need and breadth of provision is positive. This is indicative of territorial injustice as insignificant correlations are required for justice. The relationship between the depth of need and depth of provision is positive in terms of expenditure and either positive or uncorrelated in relation to staffing. The correlation between the breadth of need and expenditure per pupil indicates moderate territorial justice overall. The relationship between the majority of the indicators of the depth of need and the provision of staff provides evidence of weak territorial justice in total staff. There is less evidence of territorial justice in the provision of teaching staff than there is in total staffing. The correlation between the depth of need and total provision indicates moderate territorial justice. The correlations between the depth of need and quality of service are indicative of moderate territorial injustice.

In Tables 5.14 - 5.20, the depth of need has been correlated with the depth of service provision. The correlation between corresponding dimensions of need and provision provides the most robust evidence on territorial justice. Table 5.21 provides a summary of these correlations. A total of 245 correlations between these corresponding dimensions of need and provision have been assessed. 31% of these indicate either weak or moderate territorial justice in nursery education. A further 5% suggest territorial injustice between these dimensions of need and provision. The remaining correlations are not significant. Overall, the correlations support weak territorial justice between the corresponding dimension of depth in nursery education.

Table 5.21: Summary of the Correlation Between Depth of Need and the Depth of Provision 1981-1994

		Number of Correlations Between the Depth of Need and the Depth of provision n=245
Territorial Justice	Weak	63
	Moderate	12
Territorial Injustice	Weak	13

A further summary of the evidence on territorial justice is presented in Table 5.22. The Table highlights the extent of territorial justice and injustice in the quantity of provision together with territorial injustice in the quality of service. Taking the quantity of service provision first, the figures highlight that 27% of the correlations support territorial justice and 51% indicate territorial injustice. The largest category of justice is insignificant with 77 of the correlations. The strength of the injustice in the quantity of service is predominantly moderate. Similarly, there is moderate territorial injustice in the quality of service provision. Overall, there is more evidence of territorial injustice than justice between the depth of need and service provision.

Table 5.22: Summary of Correlation between the Depth of Need and Nursery Education Provision 1981-1994

		Quantity of Provision	Quality of Provision
		n=784	n=98
Territorial Justice	W	72	0
	M	62	0
	S	6	0
	Insig.	77	1
Total		217	1
Territorial Injustice	W	79	27
	M	236	70
	S	91	0
Total		406	97

A total of 862 correlations have been presented in Tables 5.14-5.20 between the depth of need and nursery education provision. Of these, 217 indicate territorial justice in the quantity of service provision and 503 territorial injustice in both the quantity and quality of nursery services. The correlations supporting territorial justice indicate weak, moderate and strong justice in nursery education. Of these categories of strength, weak and moderate are more evident than strong correlations: 33% of the correlations indicate weak and 28% moderate. Only 2% of the correlations support strong territorial justice. Insignificant correlations have also contributed to the evidence on territorial justice: 35% of the evidence on territorial justice is provided by these relationships. In terms of territorial injustice, the majority of the evidence indicates injustice at a moderate level (58%). Overall, the correlation

between the depth of need and nursery education provision indicates territorial injustice.

Had the Davies criterion on territorial justice been used to interpret these correlations, the conclusions drawn would have been very different. All of the positive correlations between the breadth of need and depth of provision would have been interpreted as territorially justice, rather than unjust. In addition, the positive correlations between the depth of need and the quality of service provision would also have been deemed to represent evidence of territorial justice rather than injustice. The next part of the Chapter examines the correlation between total need and nursery education provision.

C. The Correlation Between Total Need and Nursery Education Provision

This section of the Chapter examines the correlation between total need and nursery education provision. As discussed in the previous Chapter, this measure combines indicators of the breadth (child population) and the index of the depth of nursery educational need.

The correlations between total need and nursery education provision are presented in Table 5.23. In terms of the relationship between total need and the breadth of provision, territorial justice requires positive correlations. The positive correlations between total need and the majority of indicators of nursery places (FPC, PPC, PC and NSACL) therefore provide evidence of weak or moderate territorial justice. The majority of the correlations suggest moderate territorial justice. Territorial justice between these dimensions of need and provision mean that in areas where total need is greatest, nursery places are provided to match this level of need. The correlations between need and PPC, PC and NSACL are all moderate. The provision of full-time places is indicative of weak territorial justice. In terms of infant class places, (INF),

positive correlations are required for territorial justice. Significantly negative correlations are indicative of territorial justice. Across the period, the correlations are not significant.

Table 5.23: Correlations Between Total Need for Nursery Education and Nursery Education Provision in England and Wales 1981-1994

	[Breadth of Provision 1981-1994]					[Depth of Provision]			[Total Provision]	[Quality of Provision]
	FPC	PPC	PC	NSACL	INF	NEXPP	TEACH	STAFF	NEXTC	QUALP
NEEDS81	.35 ***	.36 **	.48 ***	.52 ***	.19 **	.15	.04	.12	.34 **	.30 **
NEEDS82	.32 **	.42 ***	.53 ***	.57 ***	.13	.20	.02	.12	.34 ***	.40 ***
NEEDS83	.30 **	.45 ***	.52 ***	.58 ***	.09	.11	-.01	.12	.44 ***	.42 ***
NEEDS84	.34 **	.48 ***	.56 ***	.61 ***	.16	.19	.03	.06	.45 ***	.42 ***
NEEDS85	.30 **	.49 ***	.55 ***	.64 ***	.07	.22	.11	.14	.42 ***	.45 ***
NEEDS86	.33 **	.51 ***	.59 ***	.63 ***	.13	.18	.09	.16	.46 ***	.42 ***
NEEDS87	.28 **	.47 ***	.53 ***	.60 ***	.07	.16	.09	.20 *	.41 ***	.42 ***
NEEDS88	.27 **	.48 ***	.55 ***	.64 ***	.02	-	.08	.20 *	-	.48 ***
NEEDS89	.11	.44 ***	.40 ***	.58 ***	-.08	-	.12	.26 **	-	.48 ***
NEEDS90	.11	.43 ***	.39 ***	.55 ***	-.05	-	.08	.23 *	-	.44 ***
NEEDS91	.20 *	.28 **	.36 ***	.50 ***	-.13	-	.12	.22 *	-	.47 ***
NEEDS92	.18 *	.30 **	.37 ***	.52 ***	-.18	-	.11	.16	-	.49 ***
NEEDS93	.21 *	.32 **	.41 ***	.56 ***	-.16	-	.05	.17	-	.50 ***
NEEDS94	.29 **	.29 **	.45 ***	.56 ***	-.09	-	.12	.15	-	.46 ***

Summary:

1981-1986/1991-1994										
Mean Correlation:	.28	.39	.48	.56	.03	.17	.06	.14	.40	.43
Territorial Justice:	10/10	10/10	10/10	10//10	1/10	0/6	0/10	1/10	7/7	0/14
Territorial Injustice	0/10	0/10	0/10	0/10	0/10	0/6	0/10	0/10	0/7	14/14
1987-1990										
Mean Correlation	.19	.45	.46	.59	-.01	.16	.09	.22		
Territorial Justice	2/4	4/4	4/4	4/4	0/4	0/1	0/4	4/4		
Territorial Injustice	0/4	0/4	0/4	0/4	0/4	0/1	0/4	0/4		

Note:

A number of correlations between NEEDS and FPC, PPC, PC NSACL INF, NEXPP, TEACH and STAFF in this Table are underlined. This is because rule 4 applies to these correlations. Territorial justice requires a positive correlation.

Key:

Significance levels:

*	0.05 or better
**	0.01 or better
***	0.001 or better

Variables:

Total Need:	
NDS1981-1994	Children per 1,000 population times the index of the depth of need
Breadth of Provision:	
FPC 1981-1994	Full-time places per 1,000 3 & 4 year olds
PPC 1981-1994	Part-time places per 1,000 3 & 4 year olds
PC 1981-1994	Total places per 1,000 3 & 4 year olds 1981-1994
NSACL 1981-1994	Nursery school and class places per 1,000 3 and 4 year olds
INF 1981-1994	Infant class places per 1,000 3 & 4 year olds
Depth of Provision:	
NEXPP 1981-1987	Net expenditure in nursery schools per pupil
TEACH 1981-1994	Teachers per 1,000 pupils in nursery schools and classes 1981-1994
STAFF 1981-1994	Total staff per 1,000 pupils in nursery schools and classes 1981-1994 (includes non-teaching staff)
Total Provision:	
NEXTC 1981-1987	Net expenditure in nursery schools per 3 and 4 year old
Quality of Provision:	
QUALP 1981-1994	% of all places provided in nursery schools and classes

Overall, the correlation between total need and the breadth of nursery education provision indicates territorial justice at a moderate level. Moderate territorial justice exists in 63% of the 65 correlations between these dimensions of need and provision. Evidence of weak territorial justice is provided in a further 13% and strong territorial justice in 7% of the correlations. No evidence of territorial justice is provided by the correlations.

Territorial justice requires a positive correlation between total need and the indicators of the depth of nursery provision (NEXPP, TEACH and STAFF). The figures show that the mean relationship between total need and expenditure per pupil is

insignificant. This means that as total need increases, the depth of provision (NEXPP) remains unchanged. The correlations relating to teaching staff (TEACH) are also insignificant. The relationship between total need and STAFF are insignificant with the exception of STAFF between 1987 and 1991. In these years, a positive correlation exists between total need and staffing. These provide evidence of weak territorial justice.

Territorial justice requires a positive correlation between total need and total provision since these are corresponding dimensions of need and provision. The correlations between NEEDS and NEXTC are all significantly positive. The strength of the correlation provides moderate evidence of territorial justice in the years 1980-1987.

The quality of provision is positively correlated with total need in Table 5.23. Territorial justice requires an insignificant relationship between need and quality of service. The positive correlations are therefore indicative of moderate territorial injustice.

Overall, the correlations between total need and nursery education provision presented in Table 5.23 indicate moderate territorial justice together with some evidence of injustice. The correlation between total need (NEEDS) and total provision (NEXTC) is positive and indicative of moderate territorial justice. As total needs increase, there is a corresponding rise in levels of expenditure per child. Moderate territorial justice also exists in relation to part-time nursery places, total places and nursery school and class places. The correlation between total need and full-time places provides evidence of weak territorial justice. Territorial injustice exists in relation to the quality of nursery education.

The correlation between total need and total provision provides the most reliable evidence on territorial justice. A summary of these correlations are provided in Table 5.24 below. The correlation between these dimensions indicates moderate territorial justice. However, the low number of the correlations between these dimensions precludes a more through analysis.

Table 5.24: Summary of the Correlation Between Total Need and Total Provision 1981-1987

		Number of Correlations Between the Total Need and Total Provision n=7
Territorial Justice	Moderate	7

A total of 226 correlations between total need and nursery education provision have been assessed. Table 5.25 provides a resume of these correlations. In 38% of these, the correlations indicate moderate territorial justice. Evidence of weak territorial justice is provided by 10% of the correlations and strong territorial justice by a further 3%. Territorial injustice exists in 11% of the correlations. This broad picture is one of territorial justice in terms of total need for nursery education. However, all of the injustice which exists is associated with the quality of service. Whilst there is some evidence of territorial justice in the quantity of service provision, there is injustice terms of its quality.

Table 5.25: Summary of Correlation between Total Need and Nursery Education Provision 1981-1994

		Quantity of Provision	Quality of Provision
		n=112	n=14
Territorial Justice	W	13	0
	M	48	0
	S	5	0
	Insig.	0	0
Total		66	0
Territorial Injustice	W	0	0
	M	0	14
	S	0	0
Total		0	14

This Chapter now moves on to identify the implications of this evidence of territorial justice in nursery education.

III. Implications of the Evidence

In this Chapter, the three dimensions of need have been correlated with the three dimensions of provision, together with the quality of service. Need has been measured on the basis of the child population (breadth), the child population living in disadvantaged circumstances (depth of need) and the child population together with disadvantage (total need). In each of the three dimensions, some evidence of territorial justice in the provision of nursery education has been gained. Evidence of territorial justice has been found between corresponding dimensions of need and

provision. The relationship between the breadth of need and breadth of provision indicates weak or moderate territorial justice. The correlation between the depth of need and the depth of provision provides weak or moderate territorial justice and also weak territorial injustice. The relationship between total need and total provision is moderately territorially just. These findings provide the most robust evidence on the existence of territorial justice in nursery education because they are based on the correlation between corresponding dimensions of need and provision.

Table 5.26 below presents a matrix which summarises the all of the evidence on territorial justice provided in this study. The extent of territorial justice which exists between each dimension of need and provision is highlighted in the Table. In addition, the number of correlations which support territorial justice or injustice is presented in brackets alongside the total number of correlations tested. Thus, for example, 5 of 70 correlations between the breadth of need and breadth of provision indicate weak territorial justice and 29 provide evidence of moderate territorial justice. Finally, the rule which was applied to determine the extent of territorial justice between each of the dimensions of need and provision is presented in italics.

Table 5.26: Evidence of Territorial Justice in Nursery Education in England and Wales 1981-1994

		Provision			
		Quantity of Nursery Education			Quality of Nursery Education
		Breadth	Depth	Total	
	Breadth	TJ: W (5/70) *1* M(29/70) *1*	TJ: INSIG. (26/26) *2* W (2/9) *4*	TJ: W (1/6) *3* M (1/6) *3* W (1/1) *4*	TJ: INSIG. (1/14) *7* INJUSTICE: W (2/14) *7* M (12/14) *7*
Need	Depth	TJ: INSIG. (81/435) *2* W=(3/20) *4* M=(8/20) *4* S=(6/20) *4* INJUSTICE: W (646435) *2* M (236/435) *2* S (91/435) *2*	TJ: W (64/245) *1* M (12/245) *1* INJUSTICE: W (13/245) *1*	TJ: W (5/48) *3* M (41/48) *3* M (1/1) *4*	TJ: INSIG: (1/198) *7* INJUSTICE: W (27/98) *7* M (71/98) *7*
	Total	TJ: W (7/50) *3* M (31/50) *3* S (3/50) *3* W (2/20) *4* M (10/20) *4* S (2/20) *4*	TJ: W (1/26) *3* W (4/9) *4*	TJ: M (7/7) *1*	INJUSTICE: M (14/14) *7*

Key: TJ= Territorial Justice
Injustice=Territorial Injustice
W=Weak
M=Moderate
S=Strong
INSIG=Insignificant correlation (territorial justice)

Taking the corresponding indicators of need and provision, rule 1 was applied to determine the extent of territorial justice. All of these correlations produce evidence of weak or moderate territorial justice. Weak or moderate territorial justice also exists between the depth dimensions of need and provision. Of the correlations between the depth of need and the depth of provision, 31% indicate weak or moderate territorial justice. Territorial justice also exists between the depth dimensions of need and provision. The number of correlations which indicate weak

territorial injustice is 13. This means that evidence of territorial injustice is found in 2% of the correlations. Whilst this evidence of injustice cannot be ignored, it may be considered limited. Moderate territorial justice exists between total need and total provision. Overall, the application of rule 1 on territorial justice has found weak and moderate territorial justice in nursery education.

Further conclusions on territorial justice can be developed when the correlations between non-corresponding dimensions of need and provision are considered. Rule 2 was applied to determine the extent of justice between the breadth of need and depth of provision and the depth of need and the breadth of provision. Insignificant correlations were required for territorial justice. Positive and negative correlations represented injustice. Of the 26 correlations between the breadth of need and the depth of provision which have been examined, all of these indicate territorial justice. In addition, the 81 insignificant correlations between the depth of need and breadth of nursery education provide evidence of territorial justice in 18% of the tests which were conducted. Substantial evidence of territorial injustice has also been found between the depth of need and the breadth of provision. Of 435 tests, 64 indicate weak injustice, 236 moderate injustice and 91 strong injustice. Taken together, territorial injustice has been found in 89% of the correlations tested. Overall, the application of rule 2 has provided evidence of territorial justice together with a substantial amount of territorial injustice.

Rule 3 was applied where the correlation between the dimensions of need was insignificant or did not meet the criterion of strength. A positive correlation was required for territorial justice. The positive relationship between the breadth of need and total provision indicates weak or moderate territorial justice in 2 of the 6 correlations tested. Weak and moderate territorial justice has also been found in 46 of

48 tests between the depth of need and total provision. The bulk of this evidence, 41 correlations, supports moderate territorial justice. The correlation between total need and the breadth of provision also indicates weak, moderate and strong territorial justice. Of the 50 correlations, 41 indicate territorial justice. The majority of these correlations support moderate territorial justice. Finally, rule 3 also applied between total need and the depth of service provision. Of 26 correlations, only 1 indicates weak territorial justice. In general, the application of rule 3 has provided substantial evidence of territorial justice in nursery education. The bulk of the evidence indicates moderate territorial justice. None of the correlations support the existence of territorial injustice.

Rule 4 on territorial justice applied where the correlation between the dimensions of need was strongly positive. Territorial justice required a positive correlation. Of the 9 tests of territorial justice which were conducted between the breadth of need and the depth of provision, 2 produced evidence of weak territorial justice. The other correlations were not significant. Rule 4 was applied to identify the existence of territorial justice between the breadth of need and total provision. Only one correlation was assessed, due to the limited data available on total provision. This correlation indicated weak territorial justice. Territorial justice also required a positive relationship between the depth of need and the breadth of provision in 20 of the correlations. Evidence of weak, moderate or strong territorial justice has been found in 17 of these. Weak territorial justice also exists between the depth of need and total provision. Rule 4 also applied between total need and the breadth of provision. Of the 20 correlations, 14 indicated territorial justice, with the majority of the correlations providing evidence of moderate justice. Finally, territorial justice also required a positive correlation between total need and the depth of provision. Nine tests were conducted. Weak territorial justice is found in 4 of these tests. The

application of rule 4 has provided substantial evidence of territorial justice in nursery education. Many of the correlations indicate moderate territorial justice.

Rule 7 is concerned with the relationship between need and quality of service. As indicated in Table 5.26, the vast majority of the correlations find evidence of territorial injustice in nursery education. The correlation between need and quality of service should be insignificant for territorial justice. The strength of the correlations are indicative of moderate territorial injustice. In terms of how these findings relate to existing studies, Powell (1987, 1990b) are the only studies which have included quality of service in a test of territorial justice. Powell's (1987) findings indicate evidence of a negative correlation between need and quality of health care. Powell (1990b) finds positive and negative correlations between need and quality of service. This study finds a positive correlation. Both negative and positive correlations are indicative of territorial injustice since need should be insignificantly correlated with quality of service. The finding of territorial injustice between need and quality in this study support those found by Powell (1987 and 1990b).

Table 5.27 provides the final summary of all the correlations in this study. The correlations are assessed in relation to the extent of territorial justice in the quantity and quality of service. A total of 1008 need indicators have been correlated with measures of the quantity of service provision. Of these 348 indicate territorial justice in nursery education. This means that territorial justice has been found in 35% of the tests of the quantity of service which have been undertaken. Territorial injustice exists in 406 cases, or 40%, of the correlations. In terms of strength, territorial justice exists at a weak and moderate level. Insignificant correlations also support territorial justice, although it is not possible to determine the strength of the justice associated with these. Territorial injustice exists mainly at the moderate level. On balance, there

is more evidence of territorial injustice than justice in the quantity of nursery services. However, it is not clear whether the evidence indicates that the strength of the injustice is stronger than the strength of the justice because of the strength of justice associated with insignificant correlations cannot be identified. On this basis, it may be argued that there is territorial justice and injustice in the quantity of nursery education.

Table 5.27: Evidence of Territorial Justice and Injustice in the Quantity and the Quality of Nursery Education 1981-1994

		Number of Correlations
Quantity of Nursery Education		1008
Territorial Justice	Weak	94
	Moderate	140
	Strong	11
	Insignificant	103
		348
Territorial Injustice	Weak	79
	Moderate	236
	Strong	91
		406
Quality of Service Provision		126
Territorial Justice	Insignificant	2
Territorial Injustice	Weak	29
	Moderate	95
		124

In terms of the quality of service, 126 correlations have been assessed. Almost all of these (98%) provide evidence of territorial injustice in nursery education. Quality of service is positively, rather than insignificantly, correlated with the need for nursery

education. Whilst the broad conclusion of this study is that there is some evidence of territorial justice in terms of the quantity of service provision, there is substantial territorial injustice in both the quantity and quality of nursery services.

All of the correlations between need and provision have now been assessed. Of the seven rules which were developed in Chapter two, five of these were appropriate in determining the extent of territorial justice in nursery education. It would have been inappropriate to draw conclusions on territorial justice on the basis of the application the Davies criterion of territorial justice, a positive correlation between need and provision, without considering the dimensions of need and provision being compared. Positive correlations are not indicative of territorial justice when the breadth and depth dimensions of need are uncorrelated or negatively related, or in situations where need is correlated with quality.

Had the Davies (1968) criterion on territorial justice, a positive correlation between need and provision, been adopted in this study as the sole criterion, the conclusions would have been different. All of the positive correlations between need and provision presented in the Tables would have been deemed to be indicative of territorial justice in education. On this basis, this study would have concluded that moderate and strong territorial justice existed in nursery education. Table 5.28 below presents a matrix which summarises the conclusions which would have been drawn if the Davies (1968) criterion of territorial justice been adopted. Those which are different from the conclusions drawn on the basis of the rules developed in this study are underlined and presented in italics in Table 5.28.

Table 5.28: Territorial Justice in Nursery Education: Davies (1968) Criterion

		Provision			
		Breadth	**Depth**	**Total**	**Quality**
	Breadth	TJ: W& M	*Insignificant*	Insignificant	*TJ: M*
Need	**Depth**	*TJ: W, M & S*	TJ: W & Injustice: W	TJ: W & M	*TJ: M*
	Total	TJ: W, M & S	Insignificant	TJ:M	*TJ: M*

Key: TJ= Territorial Justice
Injustice=Territorial Injustice
Insignificant= Neither Justice or Injustice
W=Weak
M=Moderate
S=Strong

In Table 5.28, there are five areas in which the use of the rules, rather than Davies (1968) criterion, leads to a different conclusion on territorial justice. Firstly, the correlation between the breadth of need and the depth of provision. This is insignificant and would, on the basis of the Davies (1968) criterion, not have been deemed territorially just. Secondly, the positive correlations between the depth of need and breadth of provision would have been interpreted as weak, moderate and strong territorial justice by Davies. This would have been inappropriate since the breadth and depth of need are not positively correlated in all of the period 1981-1994. The positive correlation in this context is, in fact, indicative of territorial injustice. The remaining three areas relate to the correlation between need and quality. All the correlations between the three dimensions of need and the quality of service provision are positive. The Davies criterion of territorial justice would have been interpreted these as territorial justice. This conclusion is inappropriate as the quality of service

should not be positively correlated with need. The application of the Davies (1968) criterion would have found a substantially higher level of territorial justice in nursery education than has been identified on the basis of the rules developed in this study. In specific terms, territorial injustice which is evident between the depth of need and the breadth of provision and between all of the dimensions of need and quality of service would all have been classified as territorial justice by Davies (1968). In addition, Davies would have classified the correlation between the breadth of need and depth of provision as insignificant instead of territorial justice. The application of the Davies (1968) criterion would therefore have overestimated the level of territorial justice and failed to recognise the territorial justice associated with insignificant correlations.

In other situations, although the adoption of the Davies (1968) criterion does not change the conclusion on territorial justice, it is inappropriate to apply this criterion in every situation. It is necessary to consider the dimensions of need and provision in the assessment of territorial justice.

Existing studies of territorial justice in education services provide an inappropriate assessment of territorial justice for five reasons. Firstly, the Davies (1968) criterion of territorial justice, a positive correlation between need and provision, is applied without considering the dimensions of need and provision which are being compared. This criterion cannot be universally applied - territorial justice can exist where the relationship between need and provision is insignificant and negative. Secondly, the studies do not assess the relationship between the breadth and depth of need. As a consequence, unless the relationship between the dimensions of need is positive, the correlations presented within existing studies have been incorrectly interpreted. If the finding in this study that the breadth and depth of need are not strongly correlated, (with the exception of one indicator in four years), can be applied within the context

of existing studies, then the correlations which have been classified as territorial justice are actually indicative of injustice. A third reason why existing studies do not provide an accurate assessment of territorial justice is that they focus on the input aspect of service provision. As both the cost of services and efficiency rates can vary between areas, (Davies 1968, Boyne and Powell 1991), inputs may not provide an accurate reflection of the service which is provided. The concentration of the existing studies on the input aspect of provision has meant that the relationship between need and the depth and total dimensions of service provision has been tested. The correlation between need and the breadth of provision has, consequently, been neglected. Fourthly, existing studies fail to consider the issue of the time-lag between need and provision. In situations where suitable lags are not adopted, the conclusions on territorial justice may not be appropriate. A fifth reason why the existing studies of territorial justice in education do not provide a complete assessment of the concept is that they do not include the issue of quality of service. As outlined in this study, quality is an important aspect of service provision and should be included in any assessment of territorial justice.

This study has addressed these issues. Firstly, it has not applied the Davies criterion for territorial justice universally. The criterion has only been considered appropriate where corresponding dimensions of need and provision were compared. Secondly, it has examined the relationship between the breadth and depth dimensions of need and applied a more appropriate set of rules on territorial justice. Thirdly, this study has measured service provision on the basis of output, together with some input, measures of provision. Fourthly, the nature of the time lag between need and provision in nursery education has been considered and an appropriate lag adopted. Fifthly, this study has included quality of service in the assessment of territorial justice. The finding that territorial injustice exists between need and quality of service

is important since this study is only one of three which has empirically assessed this issue. Both studies find similar evidence.

The figures presented in this Chapter provide some evidence of territorial justice and territorial injustice in the quantity of nursery education services. In the quantity of nursery education, local authorities have regard for the level of need for the service. Weak, moderate and some strong evidence of territorial justice has been found in nursery education. In addition, substantial moderate territorial injustice exists in the quantity of nursery education provision. Evidence of territorial injustice between need and the quality of service provision has also been presented in this Chapter. These conclusions would have been different if the Davies (1968) criterion of territorial justice had been adopted. The adoption of the criterion of a positive correlation between all dimensions of need and provision for territorial justice would have overestimated the level of territorial justice in nursery education.

This study provides the only assessment of territorial justice in nursery education in the 1980s and 1990s. It builds on the studies by Blackstone (1971) and Pinch (1984) which examined the relationship between need and provision within nursery education in 1965 and 1976 respectively. Blackstone (1971) study did not find any evidence of territorial justice in nursery education. The limitations of this study, outlined in Chapter two, may have affected its ability to find territorial justice. In the Pinch (1984) study, evidence of territorial justice was found in nursery education. The finding in this study of territorial justice in the quantity of service provision supports Pinch (1984). However, this study builds on Pinch (1984) in a number of ways. Firstly, this study has included quality as well as quantity of service in the assessment of territorial justice. Secondly, Pinch (1984) adopted a five year time-lag

between need and provision indicators. This approach, which is not justified by the author, may not be appropriate.

Conclusion

This Chapter has applied the rules for assessing territorial justice which were identified in Chapter two These rules, developed on the basis of arguments advanced by Boyne and Powell (1991), substantially revise the criterion of a positive correlation between need and provision for territorial justice developed by Davies (1968). In essence, a positive correlation between need and provision is not always required for territorial justice. Territorial justice also exists in situations where the relationship is insignificant and negative. The universal adoption of the Davies (1968) statistical criterion for territorial justice within existing studies means that there is likely to be less territorial justice in the provision of education than that found in the studies. This study represents the only study to apply the appropriate criteria for assessing territorial justice. The evidence presented in this Chapter has provided evidence of territorial justice and injustice in the quantity of service provision. Evidence of territorial injustice in the quality of nursery education has also been found. This evidence has been contrasted with the conclusions which would have been drawn had the Davies (1968) criterion of territorial justice been adopted. The Davies's (1968) criterion would have over-estimated the extent of territorial justice in nursery education.

Chapter 6: Conclusion

This study sought to address key questions relating to the theory of territorial justice, the need for and the provision of nursery education, and the extent of territorial justice in nursery education. The main limitation of the theory of territorial justice is its failure to recognise the dimensions of need and provision, as highlighted by Boyne and Powell (1991). Territorial justice does not always require a positive correlation between indicators of need and provision. This study has built on the work of Boyne and Powell (1991) and developed a new framework for a more accurate assessment of territorial justice. The concept of territorial justice put forward by Davies (1968) should therefore be re-defined to reflect these criteria. Territorial justice is more appropriately concerned with equal provision for relevant dimensions of need, rather than simply equal provision for equal need. This study also operationalised the concepts of need and provision within nursery education. All the dimensions of need and provision, including the quality of service provision, have been incorporated into the measurement of these concepts. An examination of levels of need and provision of nursery education indicated that there are substantial variations between local authority areas. Using the measures of need and provision, the empirical evidence suggests a mixture of territorial justice and injustice in the quantity of nursery education, and territorial injustice in service quality.

This Chapter presents the conclusions to this study. It is divided into five parts. Part one summarises the findings of each of the Chapters. Part two critically appraises this study and highlights its limitations. In part three, the contribution of this study to the theory and empirical evidence on territorial justice is assessed. Part four outlines the policy implications of the study. In Part five, proposals for future studies of territorial justice are put forward.

I. Findings of this Study

Chapter one examined the concept of territorial justice and reviewed previous empirical studies in education, personal social services and health care provision. The following limitations of previous studies were highlighted:

* the emphasis on the breadth of need, to the exclusion of the depth of need;
* the emphasis on service inputs, rather than outputs, in the measurement of provision;
* the exclusion of quality of service in the majority of studies;
* incomplete coverage of all geographical areas in England and Wales; and
* there have only been a few assessments of territorial justice during the 1980s and 1990s.

The Chapter outlined the historical development of nursery education provision in England and Wales. The influences which restricted or those which enhanced the development of nursery education were highlighted. Official reports have historically emphasised the need for nursery education for all children, particularly for children from 'inadequate' home circumstances. The development of nursery education has been restricted by the absence of consensus on whether children under five should be educated outside the home or not. In addition, the financial cost of nursery education has also restricted its supply.

The extent to which territorial justice is likely to exist in nursery education was also examined in Chapter one. It was argued that because central government resources are distributed to local authorities on the basis of need, local authorities were likely to have regard for this criterion in their decisions on nursery education. The level of

professionalism in nursery education is also likely to enhance territorial justice. In contrast, territorial justice may be less likely in services which are delivered by local authorities, particularly where there is no statutory obligation to provide a service. As democratically elected bodies, local authorities have the capacity to make their own decisions relating to the provision of the service. Chapter one also presented the methods of and outlined the structure of this study.

Building on the arguments advanced by Boyne and Powell (1991), the concept of territorial justice was reformulated in Chapter two. A set of rules which outline the statistical relationships required for territorial justice were developed and presented. These rules were applied to evidence in previous studies of territorial justice in education services. The re-assessment of territorial justice led to the conclusion that previous studies had over-estimated the relationship between need and provision in education - at best the relationship can be described as weak, rather than moderate. The rules developed in this Chapter provided the framework for the analysis of territorial justice in nursery education.

Chapters three and four focused on the concepts and measures of need and provision in nursery education. In Chapter three, the range of local authority nursery education provision delivered in England and Wales was examined. The Chapter identified the aspects (inputs, outputs and outcomes) and dimensions of service provision (breadth, depth, total) and examined the issue of quality in service provision. On the basis of this framework, indicators of nursery education provision were developed.

Using the indicators of nursery education provision, the level of nursery education provision across local authority areas in England and Wales between 1981-1994 is

examined. The figures highlight the variations which exist between local authorities in relation to the provision of nursery education. Whilst some authorities provide the majority of places on a full-time basis, others deliver nursery education predominantly on a part-time basis. Authorities also vary in terms of the extent of nursery school and class provision and in the level of quality of nursery education, for example. The figures show that the provision of nursery education increased between 1981 and 1994. More specifically, the breadth and total dimensions of nursery education are greater in 1994 than in 1981. The depth of nursery provision, measured in terms of net expenditure per pupil, also increased over time. In contrast, the depth of nursery services, represented by staffing, decreased over the period. The quality of nursery services increased marginally between 1981 and 1994. In the period 1986-1994, the average proportion of 'high quality' nursery education is 51% compared to 49% between 1981 and 1986.

The correlation between the separate indicators of service provision is also examined in Chapter three. This revealed that full-time and part-time places are neither substitutes nor complements for each other. The correlation between the breadth and depth dimensions of service provision is not significant for some indicators and positively related in the case of others. For example, the correlation between nursery school and class places is not significantly related to teaching staff per 1,000 children in nursery schools and classes. In contrast, the breadth of provision (nursery places) is positively related to total staffing in nursery schools and classes and net expenditure per pupil in nursery schools. Authorities which had a high breadth of provision also spent the most resources per pupil and per child on nursery school education. This pattern in provision strengthened over time. Quality of service is positively related to part-time and nursery school and class provision. Overall, the provision of nursery

education is stable over time. Levels of service in one year are strongly related to those delivered in the previous and in the following year.

The pattern of nursery education provision indicates that there is inequality in the level of service across authorities. Whilst some areas provide up to 92% of children with a nursery place (Walsall), other authorities (eg. West Sussex) provide for 22% of three and four year olds. The type of service delivered by authorities also varies between geographical areas. Some authorities clearly provide no part-time nursery places, or nursery school and class provision (Gloucester). Other areas provide the majority of all nursery places on a part-time basis (West Glamorgan) and in nursery schools and classes (Hounslow). Levels of expenditure and staffing are similarly varied between local authorities. In 1987, the authority which allocates the most resources per nursery school pupil (Sefton) spends more than 14 times more than the lowest spending authority (St. Helens). The authorities with the highest levels of nursery staffing are Haringey and Somerset. These authorities have at least 199 staff per 1,000 children, or a staff:pupil ratio of 8:1. Quality of service varies between Gloucester, with no quality nursery places, and Newham which has over 99% of its nursery places in school and class provision. These levels of service provision indicate that there is spatial inequality in nursery services.

Chapter four was concerned with the concept of need in nursery education. The Bradshaw (1972) taxonomy of need provided the framework within which need in nursery education was identified. Three approaches to the identification of need in nursery education were developed which correspond to the three dimensions of need - breadth, depth and total need. In the first approach, need was defined in terms of all children aged 3 and 4. In the second, only those children aged 3 and 4 who were

disadvantaged were identified as being in need of nursery education. In the third approach, need was defined in terms of all children aged 3 and 4, in which those who were disadvantaged having the greatest level of need. Depth of need was measured on the basis of a number of characteristics associated with need in nursery education. These characteristics were also combined to represent an index of the depth of need. Whilst this index is similar to indexes of need which exist in other policy fields, the index of the depth of need in this Chapter is specifically focused on need in nursery education. The index, which builds on the measures of need for nursery education used by central government to fund local authorities, is derived from the literature on the need for nursery education and the literature on indexes of deprivation.

The level of nursery educational need across LEA areas in England and Wales between 1981 and 1994 is identified in this Chapter. The figures indicate that the breadth of need increased between 1981 and 1994. Some elements of the depth of need, (represented by social classes IV and V, no car and ethnic population), increased, while others decreased (lone parents, large families and overcrowding). There is a sharp contrast between urban and rural areas in the level of need for nursery education. Rural areas, such as Dorset and East Sussex, clearly have the lowest breadth of need while urban areas, including Newham and Tower Hamlets, have the highest breadth of need. Depth of need is also greatest in the London Boroughs. There is less variation between authorities in the breadth of need than in the depth of need. Total need decreased slightly between 1981 and 1994. The authorities with the lowest total need are mainly rural areas which include Dorset and

the Isle of Wight. Urban authorities, such as Tower Hamlets, have the highest total need. This examination of the need for nursery education highlights the variations which exist across England and Wales. In order to determine the extent to which the pattern of provision is consistent with the need for nursery services, the relationship between need and provision requires evaluation.

In Chapter five, the extent of territorial justice in nursery education was identified. Using the indicators of need and provision developed in the previous two Chapters, the need for nursery education was correlated with its provision. The rules developed in Chapter two were used to determine the existence of territorial justice in nursery education. The application of a number of the rules is dependent on the strength of the relationship between the breadth and depth dimensions of need. This relationship was assessed and the appropriate rule to interpret the evidence was identified. The framework used by Boyne and Powell (1991) was used to determine the strength of the correlation between the dimensions of need. Of the seven rules developed in Chapter two, five of these are relevant in the identification of territorial justice in nursery education. For this data set, territorial justice requires:

* a positive correlation between corresponding dimensions of need and provision (rule 1).
* an insignificant correlation between the breadth of need and the depth of provision, and between the breadth of provision and the depth of need (rule 2);
* a positive correlation between: the breadth of need and total provision;
  the depth of need and total provision;
  total need and the breadth of provision;
  total need and the depth of provision;
  where the correlation between the dimensions of need is insignificant (rule 3);
* a positive correlation between any dimension of need and any dimension of provision where the breadth and depth of need are strongly related (rule 4)
* an insignificant correlation between any dimension of need and quality of service provision (rule 7).

Rules 5 and 6 were not applied because they required a strongly negative correlation between the dimensions of need.

This methodology is much more complex than the Davies (1968) criterion for territorial justice. Whilst recognising the intricacies involved in their application, these rules provide the tools by which the extent of territorial justice associated with every dimension of need and provision can be assessed.

The correlation between the breadth, depth and total dimensions of need and service provision, including the quality of service, is assessed. In each of the three dimensions of need, some evidence of territorial justice is gained. Evidence of territorial justice is found between each of the corresponding dimensions of need and provision (rule 1). The relationship between the breadth of need and the breadth of provision indicates weak or moderate territorial justice. The correlation between the depth of need and the depth of provision also suggests weak and moderate territorial justice. The

relationship between total need and total provision indicates moderate territorial justice.

Further conclusions on the existence of territorial justice is provided by rules 2-4 and rule 7. The application of rule 2 suggests moderate territorial injustice in nursery education. Rule 2 requires an insignificant correlation between specific dimensions of need and provision for territorial justice. The majority of the correlations between the depth of need and the breadth of provision are positive and suggest moderate territorial injustice. Rule 3, which required a positive correlation for territorial justice, provides evidence of moderate territorial justice. The application of rule 4 also suggests moderate territorial justice in the provision of nursery education. Rule 7 was applied to determine the extent of territorial justice associated with the quality aspect of service provision. All of the correlations tested provide evidence of moderate territorial injustice.

In sum, the correlations provide a mixture of evidence of territorial justice and injustice in the quantity of service provision, together with territorial injustice in the quality of service. In terms of the quantity of service, the correlations indicate weak and moderate territorial justice and moderate territorial injustice.

These findings are compared with those which would have followed from the Davies (1968) criterion of territorial justice. Taking a positive correlation to represent territorial justice, the results would have indicated greater territorial justice in the

provision of nursery education than that concluded on the basis of the new rules. The positive correlations between both the depth of need and the breadth of provision and between all three dimensions of need and the quality of service provision would have been interpreted as territorial justice instead of injustice. The adoption of the Davies (1968) criterion would therefore have over-estimated the extent of territorial justice in nursery education. These conclusions would have been incorrect since the Davies (1968) criterion of territorial justice is not appropriate for the determination of territorial justice in every situation.

In summary, a new framework for the identification of territorial justice has been put forward in this study; each of the dimensions of need and provision have been incorporated into the measurement of need and provision in nursery education and territorial justice in nursery education has been evaluated on the basis of the new and old frameworks.

II. Critical Appraisal of this Study

This study has advanced the theory of territorial justice and provided an additional study of territorial justice in public service provision which has improved on previous studies of territorial justice in seven ways. Firstly, it has applied more appropriate criteria for the assessment of territorial justice than Davies's (1968) criterion of a positive correlation between need and provision. This is only appropriate where corresponding dimensions of need and provision are compared or in situations where the correlation between the breadth and depth dimensions of need is strongly positive (Boyne and Powell 1991). Secondly, this study has examined the relationship between the breadth and depth dimensions of need and developed a number of

additional rules on territorial justice. Thirdly, indicators of the depth of need have been included in this study. These indicators relate to the depth of need of children below statutory school age. Boyne and Powell (1991:279) have argued that "information on the depth of need is likely to require specially designed surveys". Whilst recognising the limitations of these measures (see below), this study has included the depth dimension of need. Fourthly, this study has measured service provision on the basis of output, together with some input, measures of provision. Fifthly, this study has included quality of service in the assessment of territorial justice. The finding that territorial injustice exists between need and quality of service is important since this study is one of a small number of studies which have empirically assessed this issue. Sixth, this study provides an evaluation of territorial justice across all local authority areas in England and Wales. Seventh, this study offers recent evidence on the existence of territorial justice.

Any study such as this is limited by the data which is available. There are six issues which relate to the data used in this study. Firstly, this study is reliant on statistics which have been collected nationally. The limitations of this data have been highlighted throughout this study, for example, the absence of much of the data on expenditure within nursery education. Whilst such limitations must be recognised, the figures upon which this study is based provide a wealth of information on the need for and the provision of nursery education in England and Wales.

Secondly, the breadth of need has been measured on the basis all children aged 3 and 4. Whilst this measure is comprehensive in that it includes all children of nursery age, the indicator has not been adjusted to exclude children who may be receiving nursery education in the private nursery schools. Children who are receiving nursery education in this sector may not be considered to be 'in need'. On this basis, the

breadth of need for nursery education is therefore likely to be lower than that included in this study. However, national figures on the provision of private nursery education relate to the number of places which are registered with local authority social service departments. The figures do not show the take-up of these places. As indicated in Chapter three, as nursery places may be shared by a number of children, figures on the number of places do not closely reflect the number of children receiving the service. It is not possible, therefore, to accurately adjust the breadth of need measure used in this study to account for the number of children receiving private nursery education. Whilst it is important to recognise that the breadth of need is likely to be lower than that suggested in this study, the number of children receiving private nursery education is low. In comparison with local authority nursery education, private nursery schools provide for 6% of three and four year olds (Sylva and Moss 1992). On this basis, the breadth of need measure in this study may be considered close to the actual breadth of need.

A second issue relates to the measurement of the depth of need in this study. Of the six separate indicators of the depth of need, five of these relate to the child population aged 0-4 years and one of the indicators to children aged 0-15 years. Both the 0-4 years and the 0-15 years age categories are inclusive of the 3 and 4 year old population. Ideally, the indicators should relate more specifically to the child population aged 3 and 4, rather than those aged 0-4 years or those aged 0-15 years so that the depth of need relating to nursery children would be accurately reflected. However, such data are not available. The use of the 0-4 and 0-15 years categories instead of children aged three and four means that the depth of need may be narrower than that suggested in this study. However, there is no evidence to indicate whether the depth of need of three and four year olds is any different from the needs of children aged 0-4 or 0-15 years. These age categories may therefore be deemed

appropriate in the measurement of the depth of need relating to children aged three and four. Whilst recognising that the indicators included in this study provide the closest operationalisation of the depth of need as data sources permit, the indicators are not specifically focused on the 3 and 4 year old population.

The third issue relates to the measurement of need and provision in this study. Indicators of both the input and output dimensions of local authority nursery education provision have been included. Some of the measures of nursery provision relate to the number of places offered in all three types of service (nursery schools, nursery classes and infant classes). These measures are full-time, part-time and total nursery places. These three measures provide 'complete' indicators of local authority nursery education service outputs. All of the other indicators may be described as 'partial' indicators because they reflect components of service provision. The indicators of expenditure relate only to nursery school expenditure (net nursery school expenditure per pupil and net nursery school expenditure per child). The staffing indicators refer to the number of teachers per 1,000 children in nursery schools and nursery classes (teachers per 1,000 pupils and total staff per 1,000 pupils). The number of nursery places provided in nursery schools and infant classes are also examined separately. The measures of need in this study may be classified as 'complete' measures since reflect all children who are in need of nursery education. In Chapter five, indicators of 'complete' need are correlated with 'complete' and 'partial' indicators of service provision. The correlation of 'complete' need and provision indicators is appropriate as like is compared with like. However, the correlation of 'complete' measures of need with 'partial' indicators of provision raises questions about the appropriateness of this strategy. For example, the correlation of the breadth of need ('complete' need) with the number of places in nursery schools and classes ('partial' provision) may indicate weak rather than strong territorial

justice, for example, because the indicators are not comparable in their coverage. The correlations presented in Chapter five did not suggest less territorial justice using 'partial' measures of provision than 'complete' indicators. In fact, there was stronger territorial justice in a number of these correlations, for example, between the breadth of need and nursery school and class provision ('complete' need with 'partial' provision), than between the breadth of need and total places ('complete' indicators of need and provision). It was argued in Chapter two that the examination of 'partial' provision was appropriate to supplement 'complete' measures because comparisons could be drawn between particular services. For example, the extent of territorial justice in nursery school and class provision compared to infant class places. Davies (1968:22) argues that territorial injustice in parts of a service may be "required to compensate for excessive" territorial justice in other parts. It is necessary to be aware of the coverage of indicators of need and provision when they are correlated and highlight situations in which the coverage is not the same.

A further issue relating to the data concerns the measurement of service provision. Indicators of the output dimension of provision have been included. Outputs provide the most appropriate aspect of provision in the assessment of territorial justice. Ideally, additional measures of the outputs of nursery education would have been included in this study. Such indicators might include the quantity of reading tuition or other activity within nursery provision. However, these data are not available.

Fifth, an indicator of the quality of service provision has been included in this study: '% of all nursery places provided in nursery schools and classes'. This measure provides an indicator of the quality of the process as it focuses on the service which is delivered (Royal College of General Practitioners 1985). It was argued in Chapter two that indicators of both the structure and outcome aspects of quality were not

relevant in the assessment of territorial justice. It would be appropriate to include further indicators of the quality of the nursery education process. For example, the quality of the nursery education curriculum. However, this information is likely to require surveys of either those using the service and/or those providing a service. The use of this method may not be appropriate in a study such as this where the spatial scale of analysis is wide. In addition, the assessment of quality involves personal judgements about services (Walsh 1991) which may not be comparable across England and Wales. Additional indicators of the quality of the nursery education process would ideally be included in this study to enhance the assessment of the quality of nursery services. However, such information is not collected nationally. It is possible that the inspection reports produced by the Office for Standards in Education, which has adopted a more quantitative method of assessing schools than Her Majesty's Inspectors, may facilitate the development of such measures in the future.

This section has highlighted key issues in relation to the measurement of need and provision and their correlation in this study. Whilst the unavailability of data has affected the measurement of need and provision in this study, this does not significantly detract from the wealth of data which has been included. The inclusion of indicators of the depth of need mean that this is the first evidence which has ever been made available on territorial justice at this level in any sector of education. This study has also included an indicator of the quality of service provision. None of the previous studies of territorial justice in education have included indicators of the quality of service. Whilst recognising that there are some additional indicators of both service outputs and the quality of service provision and more specific measures of the

breadth and depth of need which might have been included had the data been available, the measures of need and provision in this study provide the most comprehensive analysis of territorial justice in nursery education and any local authority service to date. In terms of the 'complete' or 'partial' coverage of indicators of need and provision, this issue should be considered in the interpretation of correlations. Where indicators do not have the same coverage, this should be highlighted and recognised.

This study has been concerned with the relationship between the concept of need and service provision. As indicated in the introduction, need is one of three criteria embodied within the concept of equity (Boyne and Powell 1995). Need has been focused on in this study following Davies's (1968) work on territorial justice. The finding in this study of territorial justice and injustice in nursery education does not imply territorial equity, since merit and effort have not been considered.

III. Contribution to the Theory and Empirical Evidence on Territorial Justice

This study has highlighted the limitations of the Davies (1968) criterion of territorial justice and presented new criteria for the identification of territorial justice. These criteria build significantly on the work of Boyne and Powell (1991) in two ways. Firstly, a rationale supporting the Boyne and Powell (1991) interpretation of territorial justice has been presented. This is more detailed than that contained in Boyne and Powell (1991) as it outlines more clearly why particular correlations between need and provision are required for territorial justice. Davies's (1968) criterion of a positive correlation is well established in the academic literature. If

Boyne and Powell's (1991) interpretation of Davies's (1968) concept is to carry weight in future evaluations of territorial justice, the rationale developed in this study is required so that those undertaking such analyses understand the limitations of Davies (1968). Secondly, the rules developed in this study specify the territorial justice requirements of all the possible correlations between need and provision, including the quality of service. The rules provide more appropriate criteria for the assessment of territorial justice than that put forward by Davies (1968). The framework which has been developed is put forward to replace the Davies (1968) criterion of territorial justice in all future evaluations of territorial justice.

The new criteria for the assessment of territorial justice in this study support the analysis contained in Boyne and Powell (1991). The Davies (1968) criterion of a positive correlation between need and provision is only appropriate where: corresponding dimensions of need and provision are compared; or in situations where specific dimensions of need and provision are compared in which the correlation between the breadth and depth of need is strongly positive. Insignificant and negative correlations between need and provision are indicative of territorial justice in other situations. The new criteria represent a significant departure from the statistical criterion for territorial justice established by Davies (1968) since positive correlations are only required in particular circumstances. Davies (1968) did not consider these circumstances and applied one single universal criterion for the identification of territorial justice. The new criteria require a closer examination of the dimensions of need and provision which are correlated. They therefore provide a more comprehensive framework for the determination of territorial justice within a service than Davies's (1968) criterion. The assessment of territorial justice on the basis of the new criteria is much more complex than that established by Davies (1968).

The development of the new criteria have important implications for the studies of territorial justice which have been undertaken. In terms of the studies of territorial justice in education which were focused on in Chapter two, the application of Davies's (1968) criterion suggested that weak-moderate territorial justice existed in the provision of education services. Territorial justice had been assessed on the basis of positive correlations. As argued by Boyne and Powell (1991), this would have been appropriate where corresponding dimensions of need and provision were compared, or where specific dimensions of need and provision were compared in which the correlation between the breadth and depth dimensions of need was strongly positive. However, as the correlation between the dimensions of need within these studies cannot be determined, it is inappropriate to assume a strongly positive relationship. This is particularly the case in view of the correlation between the breadth and depth of need in this study of nursery education: the breadth and depth of need dimensions of need are, in the main, not strongly related. If this finding also exists in primary and secondary education, then previous studies have assumed that territorial justice requires positive correlations instead of insignificant correlations. The correlations within these studies have been re-evaluated on the basis of the new criteria on territorial justice developed in this study. This evaluation is limited because the correlation between the breadth and depth of need within previous studies cannot be determined. This is because none of the studies include indicators of the depth of need. Consequently, only two of the rules could be applied since the interpretation of the evidence is not dependent on the correlation between the dimensions of need. The application of the rules suggests that weak territorial justice exists in primary and secondary education. In contrast, the Davies (1968) criterion indicated weak-moderate territorial justice. Previous evidence has therefore over-estimated the strength of territorial justice in education. The revised conclusion that weak territorial

justice exists in the provision of education services must replace the previous conclusion of weak-moderate justice.

The finding that previous studies have over-estimated the extent of territorial justice in education has wider implications for studies of territorial justice in other service areas. It may be the case that territorial justice has also been over-estimated in studies of territorial justice in housing, personal social services and health. Only Boyne and Powell (1993) have assessed territorial justice appropriately. In this study, indicators of the breadth of housing need were correlated with measures of the breadth of housing provision. This provides an assessment of territorial justice on the basis of rule 1. Other dimensions of need and provision were not compared. Evidence of weak and moderate territorial injustice was found in Boyne and Powell (1993). Whilst this study assesses the extent of territorial justice in the breadth of provision, the depth, total and quality of service provision were not tested. It can be argued that Boyne and Powell (1993) provides an incomplete assessment of territorial justice within all of the dimensions of housing provision. Only one of the rules was applied. The application of the further rules may indicate different evidence of territorial justice. Whilst Boyne and Powell (1993) is limited to the evaluation of territorial justice in the breadth dimension of service provision, the study, nevertheless, provides the only accurate assessment of territorial justice. A complete re-evaluation of the previous evidence on territorial justice in all services is ideally required. If such research is being used to inform policy and decision making within the public sector, this exercise is absolutely essential. The alternative is to continue to permit unreliable evidence to influence policy. The use of the criteria developed in this study, rather than Davies's (1968), should be used in this evaluation to determine the existence of territorial justice.

This study also contributes to the empirical evidence on territorial justice. The new criteria which have been developed in this study have been applied to determine the extent of territorial justice in nursery education. In applying the new criteria, this study is important for two reasons. Firstly, it represents the first empirical and complete assessment of territorial justice within any service area. Evidence on territorial justice has been drawn from the correlation of all dimensions of need and provision, including quality of service. Secondly, this study is the first examination of territorial justice in nursery education in England and Wales since 1976. The only two previous studies of territorial justice in nursery education are those by Blackstone (1971) and Pinch (1984). Blackstone (1971) is concerned with territorial justice prior to the implementation of the 1974 structural reforms in local government. Pinch's (1984) study examines territorial justice in pre-school services (nursery education and day care provision) in 1976. Both of these studies are quite dated. In terms of their findings, only Pinch (1984) found evidence of territorial justice in nursery education. The evidence is indicative of weak and moderate territorial justice. Pinch (1984) adopted a five year time-lag between indicators of need and provision - need in 1971 was correlated with provision in 1976. The adoption of this time-lag represents the one of the limitations of this study. The other relates to the indicators of need included. The indicators of need relate more closely to the need for day care, rather than nursery education. The indicators of need include, for example, the '% employed married women with children'. Pinch (1984) explicitly includes measures such as this so that the need for day care can be identified. The absence of positive correlations between need and provision in Blackstone (1971) may have been influenced by the absence of a direct relevance of the indicators of need to children under five years. The measures relate more specifically to the needs of adults, rather than to children. Blackstone (1971) only examined territorial justice in one year. This study of territorial justice in nursery education 1981-1994 is a considerable

improvement in these studies. First, it employs a more appropriate framework for the identification of territorial justice than Davies's (1968) criterion. Second, the indicators of need included in this study improve the measurement of need for nursery education contained within Blackstone (1971) and Pinch (1984).

IV. Policy Implications

This section identifies the policy implications of the findings of this study, first in terms of nursery education, and second within other sectors of education and public services more generally. Evidence of territorial justice and injustice has been revealed in the provision of nursery education in England and Wales. The evidence of territorial justice means that the distribution of service provision across geographical areas is consistent with the level of need. Some evidence of territorial justice between corresponding dimensions of need and provision has been found. Thus nursery places (breadth of provision) are provided on the basis of the number of three and four year olds (breadth of need). Similarly, there is evidence of territorial justice in the depth and total dimensions of provision. Evidence of territorial justice has also been found between non-corresponding dimensions of need and provision. For example, between total need and the breadth of provision. The correlations indicate weak and moderate territorial justice. In addition, the insignificant correlations between the depth of need and the breadth of provision are indicative of territorial justice. The evidence of territorial justice means the need criterion of equity has been upheld.

Evidence of territorial injustice in the quantity and quality of nursery education has also been found. In terms of the quantity of service, weak territorial injustice exists between the depth of need and the depth of service provision. Further, weak, moderate and strong territorial injustice exists between the depth of need and the

breadth of service provision. The distribution of the quality of service provision is also inconsistent with any of the three dimensions of need.

Territorial justice in nursery education would be enhanced by three policies: first, although there is some evidence of territorial justice between the depth of need and the depth of provision, there is also territorial injustice. Injustice means that areas where children live with the highest depth of need do not provide more depth of service. Territorial justice would be enhanced through the delivery of more depth of service provision to those with the greatest need. Second, the positive correlation between the depth of need and the breadth of provision indicates that local authorities provide more nursery places when faced with increases in the depth of need. This policy response is inconsistent with territorial justice. Instead, policy makers should not increase the breadth of provision in response to rises in the depth of need. Third, quality of service is positively correlated with all of the three dimensions of need. This means that local authorities increase the proportion of quality nursery education when rises in need occur. Again, this policy is inconsistent with territorial justice. Quality of service should not be responsive to increases in nursery educational need - quality should be constant regardless of the level of need. In decisions relating to the provision of nursery education, local authorities should focus much more clearly on the adoption a policy response which is appropriate to need. Thus where the depth of need increases, for example, territorial justice requires that the depth of provision should increase in proportion to the increases in the breadth of need.

The findings of this study are important at a time when variations in the provision of nursery education between local authority areas are being focused on at a national level. As indicated in Chapter one, it has been asserted that access to nursery education is a 'lottery' (Pugh 1987). More specifically, the Audit Commission

(1996:3) have argued that "access to services is uneven, varying from one authority to another". Claims such as these do not in themselves provide evidence of territorial injustice - access to services may vary on the basis of the number of three and four year olds. This would therefore be indicative of territorial justice. As argued by Smith (1994a), arithmetic inequality does not necessarily imply proportional inequality.

The introduction of nursery education vouchers to parents of four year olds who take up a nursery place outside the home is a policy which is likely to promote territorial justice between the breadth of need and the breadth of provision. This is because a voucher of the same value will be allocated to parents, regardless of the circumstances of families. Two of the approaches to the measurement of nursery educational need in this study are based on the premise that some children have a higher depth of need than other children. The distribution of education vouchers will not meet the specific needs of these children unless local authorities, or other providers of nursery education, are prepared to 'top up' the amount of provision. If local authorities do 'top up' the level of provision allocated to children with the greatest depth of need, then territorial justice between the depth of need and the depth of provision is likely to be enhanced. Thus, whilst the voucher will provide all children with access to a nursery place, those who have the greatest depth of need should, on the basis of territorial justice, be allocated additional levels of service provision, for example, a higher number of teachers than other children.

As argued above, the introduction of education vouchers is likely to promote the achievement of territorial justice between the breadth dimensions of need and provision. The depth dimension of need will be ignored unless those who deliver nursery education provide additional amounts of service provision to children in these

circumstances. These conclusions on the likely impact of the voucher have been formulated on the basis of rules on territorial justice which have been developed in this study. In sharp contrast, the Davies (1968) criterion of territorial justice, a positive correlation between need and provision, would have concluded that the voucher system would have promoted territorial justice since need and provision are likely to be positively related - all children aged four will have access to a nursery place. However, the voucher system will only enhance the achievement of territorial justice between the breadth dimensions of need and provision and not all of the three dimensions.

The findings of this study have wider implications for studies of territorial justice in other aspects of education services and other public services. It was argued in the introduction to this study that territorial justice was less likely to exist in nursery education than in other services because of: the absence of a statutory obligation to provide the service, and local authorities have their own democratic legitimacy and therefore have the power to make decisions relating to the provision of nursery education. It was also argued that territorial justice in nursery education was likely to be promoted through the need criteria which are used to fund local authorities. These criteria are predominantly based on a recognition of the depth dimension of need (70%) together with the breadth of need (30%). In addition, it was argued that the level of professionalism in education for the under-fives was likely to enhance the achievement of territorial justice. Some evidence of territorial justice and injustice has been provided in this study.

This evidence supports both of the arguments. It is possible that the funding criteria and the level of professionalism in nursery education have promoted territorial justice. Central government funding of local authorities on the basis of a socially defined

criterion of need (depth of need) and the number of children 0-4 years (breadth of need) may have encouraged local authorities to allocate similar amounts of resources within nursery education. Since the majority of central government resources are provided to local authorities on the basis of the depth of need, it might be expected that the correlation between the depth of need and the depth of provision would be indicative of stronger territorial justice than the correlation between the breadth of need and breadth of provision. As indicated in this study, the correlations between the breadth of need and breadth of provision indicate weak and moderate territorial justice. In contrast, the correlations between the depth of need and the depth of provision suggest weak, together with some moderate, territorial justice and weak injustice. Thus, whilst local authorities receive the majority of resources in nursery education from central government on the basis of depth of need criteria, they appear to use the resources to enhance the breadth of provision more than the depth of provision. More nursery places are provided instead of increasing the level of service per child. However, whilst recognising that the correlation is stronger between need and the breadth of provision than depth of provision, there is territorial justice in both dimensions. This may have been influenced by the funding criteria. In addition, territorial justice may have been enhanced due to the existence of professionalism in nursery education. Nursery education is provided by education authorities and delivered by professionally trained nursery teachers and assistants. Nursery education establishments are also subject to national inspection arrangements which require conformity to professional standards. The extent to which territorial justice has been promoted because of the need criteria adopted by central government in the allocation of local authority resources and the level of professionalism operating within nursery education has not been tested. These provide avenues for the development of this research.

Evidence of territorial injustice has also been found in this study. Territorial injustice exists between the depth of need and the breadth of provision and between all dimensions of need and the quality of service provision. It was hypothesised that territorial justice was less likely in nursery education due to the absence of a statutory obligation to provide nursery services, together with the capacity of local authorities to make decisions relating to nursery education. The extent to which the absence of central control of local authority decision making in nursery education, coupled with the fact that local authorities have their own democratic legitimacy, have led to territorial injustice cannot be identified. Thus, whilst the hypothesis is supported by the evidence indicating territorial injustice, the contribution of these factors to the injustice cannot be identified.

V. Further Research

Thus study has developed a new method for the assessment of territorial justice in public service provision. The framework which has been presented should be used in future assessments of territorial justice in public service provision. The quality of future studies of territorial justice is likely to be enhanced in a number of ways. First, the new criteria for the assessment of territorial justice demand a much closer examination of the concepts of need and provision and their operationalisation than has previously been undertaken. The widespread exclusion of measures of the depth of need in particular within previous studies may be remedied as a result of the new rules. Second, the relationship between need and quality of service provision is also neglected in the majority of previous studies. Quality of service is also more likely to receive attention in future studies of territorial justice.

Territorial justice concerns the relationship between the need for a service and its provision. The extent to which variations in the provision of nursery education are

consistent with variations in the need for the service is evaluated. Need is one influence on service provision. The other influences on service provision may be the resources which local authorities have available to them, local politics, incrementalism and delivery organisations themselves. The economic or resource environment within which local authorities operate can inhibit or facilitate the ability of a local authority to respond to service need (Boyne 1990). It has been argued in Chapter one of this study that the lack of resources may have inhibited the provision of nursery education (Randall 1995). The impact of central government resources, through the grant system, on local authority provision requires examination (Barnett 1990). In terms of local politics, local elections provide political parties with the necessary power, or mandate, to carry out a set of policies (Boyne 1996a). These policies may or may not be supportive of nursery education (Hoggart and Shrives 1991). There are no empirical analyses of the impact of political parties on nursery education provision as distinct from day care services (see Boyne 1996b for a comprehensive review). Incrementalism is a theory of budgeting in which "financial allocations reflect the pursuit of marginally redefined goals by corresponding marginal adjustments in heads of expenditure" (Kelly 1989:189). This suggests that current levels of resources and service provision closely reflect historical patterns. Unless these historical patterns of resource allocation and service provision were based on need, and continue to reflect need, territorial justice is unlikely to exist. Finally, delivery organisations may also influence service provision. Within the context of the N. Ireland education system, McKeown and Connolly (1992) argue that "the relatively small local policy community provides an opportunity for informality and flexibility in the operation of the policy process". These influences may exist within local authorities and serve to promote or restrict the supply of nursery education. It may be the case that key individuals are influential in determining the pattern of service provision. Blackstone's (1971) analysis of decision making within a number of local authorities

provides some support for this argument in nursery education. The relationship between resources, local politics and incrementalism on service provision and the influence of delivery organisations are outside the remit of this study as territorial justice is only concerned with the correlation between need and provision. This study has focused on this relationship alone. The influence of resources, politics and incrementalism on nursery education provide an avenue for additional research studies. To what extent is the pattern of provision influenced by the amount of resources which local authorities have available to them? What impact does local politics have on nursery education provision? Is the theory of incrementalism relevant in nursery education? What influence do delivery organisations and their personnel have on levels of provision? The answers to these questions would provide additional information on the factors which influence the provision of nursery education services.

Nursery education is facing an uncertain future for two reasons. Firstly, the structure of local government in England and Wales was re-organised in April 1996. Some local authorities in England have been re-constituted and others have been replaced with new geographical boundaries. Local authorities in Wales have been replaced by 22 unitary authorities. Secondly, the introduction of the voucher for the parents of four year olds in April 1997 is likely to change the pattern of need and provision within nursery education. For both of these reasons, this study may represent the only evaluation of territorial justice in nursery education during the 1980s and 1990s. In addition, it may constitute the only study of territorial justice prior to the implementation of the voucher system. Its conclusions provide valuable research material for a similar study to be undertaken after local government reorganisation and the introduction of the education voucher. How have these influences affected the need and provision of nursery education in England and Wales? Is there greater or less territorial justice? A similar study may therefore be undertaken in the future in

order to determine how need and provision in nursery education have been affected by these reforms.

This study has amended and improved the concept of territorial justice put forward by Davies (1968) and provided new evidence on territorial justice within public service provision in England and Wales. In reformulating the concept of territorial justice, this study has re-invigorated the issue and offered a new focus for both the concept and future evaluations of territorial justice in public policy. This focus has to be on the extent to which territorial justice has been achieved within the specific dimensions of need and provision. Territorial justice offers those delivering public services a means of responding to need. Thus where the number of individuals in need increase (breadth of need), territorial justice requires proportionate increases in levels of service provision. For example, additional school places or hospital treatments (breadth of provision). Policy makers will also have to assess the extent to which they wish to promote territorial justice within public services and identify the opportunity costs of its enhancement. Territorial justice may require greater central control and therefore restrict the capacity of delivery organisations to adopt particular policy responses which may be more in keeping with local conditions and circumstances. Territorial justice may also conflict with local politics. The ability of democratically elected organisations to adopt policies desired by the electorate may be restrained since territorial justice will always require policy responses which are based on need. There may also be conflict between territorial justice and the incremental practices in public sector organisations. The requirement of territorial justice for service provision to respond to need may demand substantial change in an organisation's current activities. This change may not be possible, particularly in the short term. The empirical evidence on territorial justice which currently exists has to be considered with caution since the Davies (1968) criterion of territorial justice has been used to

assess territorial justice. Consequently, the extent to which territorial justice has been achieved is not clear. The study is the first to apply the new criteria in the determination of territorial justice in nursery education. Further studies using these criteria are required in other areas of public policy.

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APPENDIX I

CORRELATION BETWEEN INDICATORS OF PROVISION 1981-1994

TABLES 3.14 - 3.27

APPENDIX I

Table 3.14: Correlation Between Indicators of Provision 1981

	[Breadth of Provision				]	[Depth of Provision		]	[Total Provision]	[Quality of Provision]
	FPC81	PPC81	PC81	NSACL81	INF81	NEXPP81	TEACH81	STAFF81	NEXTC81	QUALP81
FPC81	1.0000									
PPC81	.1220	1.0000								
	***	***								
PC81	.7231	.7504	1.0000							
	***	***	***							
NSACL81	.4492	.8145	.8776	1.0000						
	***	**	***	**						
INF81	.7831	.2955	.7024	.2752	1.0000					
	***		*		*					
NEXPP81	.3821	.0082	.2302	.1590	.2239	1.0000				
TEACH81	.0024	.1625	.1237	.1529	.0210	.1304	1.0000			
			*	**						
STAFF81	.1824	.1686	.2636	.2804	.1124	.1064	.6591	1.0000		
	***		***	***		**	**	***		
NEXTC81	.3669	.2115	.4821	.5231	.1853	.2856	.2857	.4396	1.0000	
		***	*	***	***				**	
QUALP81	-.1098	.4791	.2807	.6592	-.4160	.0028	.1180	.1884	.3436	1.0000

n=95 for all variables, except net expenditure per pupil (NEXPP81-94), where n=81. Also, net expenditure per child (NEXTC81-94), n=82.

Significance levels:

* 0.05 or better

** 0.01 or better

*** 0.001 or better

Table 3.15: Correlation Between Indicators of Provision 1982

	[Breadth of Provision				]	[Depth of Provision		]	[Total Provision]	[Quality of Provision]
	FPC82	PPC82	PC82	NSACL82	INF82	NEXPP82	TEACH82	STAFF82	NEXTC82	QUALP82
FPC82	1.0000									
PPC82	.03959	1.0000								
	***	***								
PC82	.6796	.7715	1.0000							
	***	***	***							
NSACL82	.3996	.8431	.8846	1.0000						
	***		***							
INF82	.7515	.1813	.5941	.1503	1.0000					
	**				*					
NEXPP82	.3574	.0208	.2165	.1427	.2208	1.0000				
TEACH82	.0100	.1433	.1204	.1486	-.0012	-.0249	1.0000			
		*	**	**			***			
STAFF82	.1921	.2104	.3031	.3023	.1212	-.0366	.6680	1.0000		
	***		***	***	*		*	***		
NEXTC82	.4121	.2045	.5222	.5220	.2393	.2110	.2333	.4558	1.0000	
		***	***	***	***			*	**	
QUALP82	-.0784	.5871	.4025	.7433	-.4288	.0033	.1481	.2323	.3022	1.0000

n=95 for all variables, except net expenditure per pupil (NEXPP81-94), where n=81. Also, net expenditure per child (NEXTC81-94), n=82.

Significance levels:

*	0.05 or better
**	0.01 or better
***	0.001 or better

Table 3.16: Correlation Between Indicators of Provision1983

	[Breadth of Provision				]	[Depth of Provision		]	[Total Provision]	[Quality of Provision]
	FPC83	PPC83	PC83	NSACL83	INF83	NEXPP84	TEACH84	STAFF84	NEXTC83	QUALP83
FPC83	1.0000									
PPC83	.1110	1.0000								
	***	***								
PC83	.6739	.7858	1.0000							
	***	***	***							
NSACL83	.3747	.8611	.8800	1.0000						
	***		***							
INF83	.7629	.1479	.5691	.1105	1.0000					
	**									
NEXPP3	.3293	.0317	.1910	.1393	.1718	1.0000				
TEACH83	.0346	.0414	.0642	.0386	.0715	.0926	1.0000			
			**	*			***			
STAFF83	.1569	.1851	.2624	.2562	.1112	.0952	.6339	1.0000		
	***		***	***		*		**		
NEXTC83	.4211	.2109	.5068	.5462	.1764	.2465	.0928	.3742	1.0000	
		***	***	***	***				***	
QUALP83	-.1327	.5954	.3773	.7333	-.4788	.0161	.0278	.1638	.3548	1.0000

n=95 for all variables, except net expenditure per pupil (NEXPP81-94), where n=81. Also, net expenditure per child (NEXTC81-94), n=82.

Significance levels:

*	0.05 or better
**	0.01 or better
***	0.001 or better

Table 3.17: Correlation Between Indicators of Provision1984

	[Breadth of Provision				]	[Depth of Provision	]		[Total Provision]	[Quality of Provision]
	FPC84	PPC84	PC84	NSACL84	INF84	NEXPP84	TEACH84	STAFF95	NEXTC84	QUALP84
FPC84	1.0000									
PPC84	.1308	1.0000								
	***	***								
PC84	.6988	.7788	1.0000							
	***	***	***							
NSACL84	.3851	.8744	.8758	1.0000						
	***		***							
INF84	.8028	.1719	.6217	.1664	1.0000					
	**		*	*						
NEXPP84	.3355	.1099	.2603	.2324	.1631	1.0000				
TEACH84	-.0231	.0035	-.0018	.0211	-.0379	.1601	1.0000			
							***			
STAFF84	.0773	.1851	.1985	.1950	.0892	.1335	.6482	1.0000		
	***		***	***	*	**		***		
NEXTC84	.4673	.2008	.5308	.5328	.2488	.3142	.1588	.3998	1.0000	
QUALP84	-.1393	.6103	.3635	.7276	-.4383	.1067	.0389	.1092	.2956	1.0000
	(95)	(95)	(95)	(95)	(95)	(95)	(95)	9 95)	(95)	
	P=.178	P=.000	P=.000	P=.000	P=.000	P=.356	P=.708	P=.292	P=.009	

n=95 for all variables, except net expenditure per pupil (NEXPP81-94), where n=81. Also, net expenditure per child (NEXTC81-94), n=82.

Significance levels:

*	0.05 or better
**	0.01 or better
***	0.001 or better

Table 3.18: Correlation Between Indicators of Provision1985

	[Breadth of Provision				]	[Depth of Provision		]	[Total Provision]	[Quality of Provision]
	FPC85	PPC85	PC85	NSACL85	INF85	NEXPP85	TEACH85	STAFF85	NEXTC85	QUALP85
FPC85	1.0000									
PPC85	.0989 ***	1.0000 ***								
PC85	.6948 ***	.7521 ***	1.0000 ***							
NSACL85	.3494 ***	.8669	.8558 ***	1.0000						
INF85	.7948 **	.1212	.5962 *	.0949	1.0000					
NEXPP85	.3624	.0786	.2575	.1951	.2072	1.0000				
TEACH85	.0296	.1040	.1175	.1189	.0401	.1866	1.0000 ***			
STAFF85	.1306 ***	.1293	.1974 ***	.1956 ***	.0763 *	.1694 *	.6707 *	1.0000 ***		
NEXTC85	.4908	.1288 ***	.4979 **	.4858 ***	.2348 ***	.3252	.2538	.4645	1.0000 *	
QUALP85	-.1706	.6119	.3451	.7384	-.4817	.0494	.0883	.1131	.2685	1.0000

n=95 for all variables, except net expenditure per pupil (NEXPP81-94), where n=81
Also, net expenditure per child (NEXTC81-94), n=82.

Significance levels:

*	0.05 or better
**	0.01 or better
***	0.001 or better

Table 3.19: Correlation Between Indicators of Provision1986

	[Breadth of Provision				]	[Depth of Provision		]	[Total Provision]	[Quality of Provision]
	FPC86	PPC86	PC86	NSACL86	INF86	NEXPP86	TEACH86	STAFF86	NEXTC86	QUALP86
FPC86	1.0000									
PPC86	.0986 ***	1.0000 ***								
PC86	.6851 ***	.7714 ***	1.0000 ***							
NSACL86	.3566 ***	.8748	.8786 ***	1.0000						
INF86	.7904 **	.1133	.5825	.1032	1.0000					
NEXPP86	.3376	.0345	.1964	.1308	.1857	1.0000				
TEACH86	.0499	.0819	.1168 *	.0878 *	.0881	.1009	1.0000 ***			
STAFF86	.1744 ***	.1548	.2483 ***	.2045 ***	.1630	.0534 *	.7330	1.0000 ***		
NEXTC86	.4380	.1319 ***	.4680 ***	.4629 ***	.2056 ***	.2342	.1343	.4050	1.0000 *	
QUALP86	-.1643	.6313	.3692	.7393	-.4717	.0117	.0397	.0903	.2653	1.0000

n=95 for all variables, except net expenditure per pupil (NEXPP81-94), where n=81. Also, net expenditure per child (NEXTC81-94), n=82.

Significance levels:

*	0.05 or better
**	0.01 or better
***	0.001 or better

Table 3.20: Correlation Between Indicators of Provision1987

	[Breadth of Provision				]	[Depth of Provision		]	[Total Provision]	[Quality of Provision]
	FPC87	PPC87	PC87	NSACL87	INF87	NEXPP87	TEACH87	STAFF87	NEXTC87	QUALP87
FPC87	1.0000									
PPC87	.0981	1.0000								
	***	***								
PC87	.6896	.7662	1.0000							
	**	***	***							
NSACL87	.3420	.8753	.8597	1.0000						
	***		***							
INF87	.8010	.1015	.5825	.0856	1.0000					
	***		*		*					
NEXPP87	.4137	.0557	.2653	.1635	.2649	1.000				
TEACH87	-.0654	-.0670	-.0633	-.0482	-.0469	.0660	1.0000			
				*			***			
STAFF87	.1045	.1597	.2126	.2153	.0720	.0375	.6481	1.0000		
	***		***	***	*	*		***		
NEXTC87	.5412	.0874	.4978	.4627	.2637	.2285	.0791	.4153	1.000	
		***	**	***	***				*	
QUALP87	-.1995	.6290	.3441	.7339	-.4968	-.0058	.0243	.1651	.2397	1.0000

n=95 for all variables, except net expenditure per pupil (NEXPP81-94), where n=81. Also, net expenditure per child (NEXTC81-94) n=82.

Significance levels:

*	0.05 or better
**	0.01 or better
***	0.001 or better

Table 3.21: Correlation Between Indicators of Provision1988

	[Breadth of Provision				]	[Depth of Provision]		[Quality of Provision]
	FPC88	PPC88	PC88	NSACL88	INF88	TEACH88	STAFF88	QUALP88
FPC88	1.0000							
PPC88	.0424	1.0000						
	***	***						
PC88	.6669	.7494	1.000					
	**	***	***					
NSACL88	.3252	.8507	.8560	1.0000				
	***		***					
INF88	.7578	.0577	.5338	.0198	1.0000			
TEACH88	-.0339	-.0861	-.0742	-.0315	-.0921	1.0000		
				*		***		
STAFF88	.1095	.1217	.1903	.2220	.0048	.6270	1.0000	
		***	***	***	***			
QUALP88	-.1686	.6274	3771	7625	-.5181	.0364	.1786	1.0000

n=95.

Significance levels:

*	0.05 or better
**	0.01 or better
***	0.001 or better

Table 3.22: Correlation Between Indicators of Provision1989

	[Breadth of Provision				]	[Depth of Provision]		[Quality of Provision]
	FPC89	PPC89	PC89	NSACL89	INF89	TEACH89	STAFF89	QUALP89
FPC89	1.0000							
PPC89	-.0288	1.0000						
	***	***						
PC89	.7029	.6690	1.0000					
	**	***	***					
NSACL89	.3048	.8352	.8262	1.0000				
	***		***					
INF89	.8224	.0299	.6279	.0803	1.0000			
TEACH89	.0014	-.0817	-.0436	-.0219	-.0473	1.0000		
				*		***		
STAFF89	.0685	.1377	.1892	.2379	-.0274	.6571	1.0000	
	*	***	**	***	***		*	
QUALP89	-.2176	.6290	.3018	.7466	-.4975	.0618	.2512	1.000

n=103, except teachers and staff per 1,000 pupils in nursery schools (TEACH89-90 and STAFF89-90) where n=95.

Significance levels:

*	0.05 or better
**	0.01 or better
***	0.001 or better

Table 3.23: Correlation Between Indicators of Provision1990

	[Breadth of Provision				]	[Depth of Provision]		[Quality of Provision]
	FPC90	PPC90	PC90	NSACL90	INF90	TEACH90	STAFF90	QUALP90
FPC90	1.0000							
PPC90	-.0117	1.0000						
	***	***						
PC90	.7056	.6775	1.0000					
	**	***	***					
NSACL90	.3096	.8402	.8280	1.0000				
	***		***					
INF90	.8279	.0506	.6396	.0986	1.0000			
TEACH90	-.0343	-.1014	-.0811	-.0528	-.0690	1.0000		
						***		
STAFF90	.0447	.0680	.1270	.1434	.0119	.6125	1.000	
	*	***	**	***	***			
QUALP90	-.2325	.6214	.2834	.7313	-.4996	.0384	.1191	1.0000

n=103, except teachers and staff per 1,000 pupils in nursery schools (TEACH89-90 and STAFF89-90) where n=95.

Significance levels:

* 0.05 or better
** 0.01 or better
*** 0.001 or better

Table 3.24: Correlation Between Indicators of Provision1991

	[Breadth of Provision				]	[Depth of Provision]		[Quality of Provision]
	FPC91	PPC91	PC91	NSACL91	INF91	TEACH91	STAFF91	QUALP91
FPC91	1.0000							
PPC91	-.1140	1.0000						
	***	***						
PC91	.5952	.7285	1.0000					
	**	***	***					
NSACL91	.3071	.8020	.8602	1.0000				
	***		***					
INF91	.6416	.0565	.4891	-.0240	1.0000			
TEACH91	-.0202	-.0236	-.0199	.0493	-.1237	1.0000		
						***		
STAFF91	.0916	.0111	.0665	.0815	-.0115	.4570	1.000	
		***	***	***	***			
QUALP91	-.0800	.6113	.4393	.8050	-.5158	.1207	.1086	1.0000

n=115, except teachers and staff per 1,000 pupils in nursery schools (TEACH91-94 and STAFF91-94) where n=107.

Significance levels:

*	0.05 or better
**	0.01 or better
***	0.001 or better

Table 3.25: Correlation Between Indicators of Provision1992

	[Breadth of Provision				]	[Depth of Provision]		[Quality of Provision]
	FPC92	PPC92	PC92	NSACL92	INF92	TEACH92	STAFF92	QUALP92
FPC92	1.0000							
PPC92	-.0911	1.0000						
	***	***						
PC92	.6211	.7239	1.0000					
	**	***	***					
NSACL92	.2494	.8288	.8251	1.0000				
	***		***					
INF92	.6778	.0369	.4986	-.0331	1.0000			
TEACH92	.0377	.0069	.0304	.1123	-.0733	1.0000		
						***		
STAFF92	.0681	-.0408	.0137	.0896	-.1048	.4946	1.0000	
		***	***	***	***			
QUALP92	-.1212	.6120	.3977	.8104	-.5278	.1576	1548	1.0000

n=115, except teachers and staff per 1,000 pupils in nursery schools (TEACH91-94 and STAFF91-94) where n=107.

Significance levels:

*	0.05 or better
**	0.01 or better
***	0.001 or better

Table 3.26: Correlation Between Indicators of Provision1993

	[Breadth of Provision				]	[Depth of Provision]		[Quality of Provision]
	FPC93	PPC93	PC93	NSACL93	INF93	TEACH93	STAFF93	QUALP93
FPC93	1.0000							
PPC93	-.1284	1.0000						
	***	***						
PC93	.5839	.7301	1.0000					
	**	***	***					
NSACL93	.2762	.8247	.8655	1.0000				
	***		***					
INF93	.6816	.0131	.4803	-.0237	1.0000			
TEACH93	-.0153	-.2174	-.1848	-.1399	-.1214	1.0000		
						***		
STAFF93	.0515	.0235	.0529	.1110	-.0909	.6263	1.000	
		***	***	***	***			
QUALP93	-.0999	.6514	.4644	.8197	-.5084	.0054	.1658	1.0000

n=115, except teachers and staff per 1,000 pupils in nursery schools (TEACH91-94 and STAFF91-94) where n=107.

Significance levels:

*	0.05 or better
**	0.01 or better
***	0.001 or better

Table 3.27: Correlation Between Indicators of Provision1994

	[Breadth of Provision				]	[Depth of Provision]		[Quality of Provision]
	FPC94	PPC94	PC94	NSACL94	INF94	TEACH94	STAFF94	QUALP94
FPC94	1.0000							
PPC94	-.1627	1.0000						
	***	***						
PC94	.5766	.7123	1.0000					
	**	***	***					
NSACL94	.2535	.8246	.8631	1.0000				
	***		***					
INF94	.6980	-.0314	.4705	-.0394	1.0000			
TEACH94	-.0219	-.1796	-.1601	-.0921	-.1574	1.0000		
						***		
STAFF94	.1592	-.0303	-.0845	.1223	-.0505	.6600	1.000	
		***	***	***	***			
QUALP94	-.1422	.6629	.4478	.8172	-.5420	.0559	.1698	1.0000

n=115, except teachers and staff per 1,000 pupils in nursery schools (TEACH91-94 and STAFF91-94) where n=107.

Significance levels:

*	0.05 or better
**	0.01 or better
***	0.001 or better

APPENDIX II

CORRELATION BETWEEN INDICATORS OF NEED 1981-1991

TABLES 4.19 - 4.29

APPENDIX II

Table 4.19: Correlation Between Indicators of Need 1981

	[Breadth Need]	[Depth of Need						]	[Total Need]
	CTP81	CLASS81	NLONE81	NLGE81	NPPR81	NNCAR81	NNCW81	NDS81	NEEDS81
CTP81	1.0000								
CLASS81	.4144***	1.0000							
NLONE81	.1208	.5563***	1.0000						
NLGE81	.1242	-.4365***	-.4868***	1.0000					
NPPR81	.1294*	.5345***	.7389***	-.5032***	1.0000				
NNCAR81	.2088	.8254***	.6938***	-.6541***	.6140***	1.0000			
NNCW81	.0530	.0948	.3842***	-.2029*	.6687***	.0679	1.0000		
NDS81	.2242*	.7649***	.8225***	-.5574***	.9238***	.8069***	.5927***	1.0000	
NEEDS81	.6380***	.7630***	.6836***	-.3467***	.7782***	.6934***	.4943***	.8765***	1.0000

n=103, except 3 and 4 year olds per 1,000 population 1981-1990 (CTP) where n=95.

Significance levels:

* 0.05 or better
** 0.01 or better
*** 0.001 or better

Table 4.20: Correlation Between Indicators of Need 1982

	[Breadth Need]	[Depth of Need						]	[Total Need]
	CTP82	CLASS82	NLONE82	NLGE82	NPPR82	NNCAR82	NNCW82	NDS82	NEEDS82
CTP82	1.0000								
	***								
CLASS82	.4368	1.0000							
		***							
NLONE82	.1628	.5582	1.0000						
		***	***						
NLGE82	.0231	-.4571	-.5280	1.0000					
		***	***	***					
NPPR82	.1691	.5075	.7347	-.5127	1.0000				
	**	***	***	***	***				
NNCAR82	.2756	.8265	.7187	-.6771	.6034	1.0000			
			***	*	***				
NNCW82	.0770	.0716	.3773	-.2148	.6797	.0733	1.0000		
	**	***	***	***	***	***	***		
NDS82	.2933	.7543	.8289	-.5875	.9175	.8120	.5390	1.0000	
	***	***	***	***	***	***	***	***	
NEEDS82	.6802	.7483	.6818	-.3939	.7695	.7047	.4914	.8743	1.0000

n=103, except 3 and 4 year olds per 1,000 population 1981-1990 (CTP) where n=95.

Significance levels:

* 0.05 or better
** 0.01 or better
*** 0.001 or better

Table 4.21: Correlation Between Indicators of Need 1983

	[Breadth Need]	[Depth of Need						]	[Total Need]
	CTP83	CLASS83	NLONE83	NLGE83	NPPR83	NNCAR83	NNCW83	NDS83	NEEDS83
CTP83	1.0000								
	***								
CLASS83	.4397	1.0000							
		***							
NLONE83	.1435	.5591	1.0000						
		***	***						
NLGE83	-.0048	-.4776	-.5711	1.0000					
	*	***	***	***					
NPPR83	.2348	.4751	.7251	-.5205	1.0000				
	**	***	***	***	***				
NNCAR83	.3053	.8253	.7439	-.7013	.5890	1.0000			
			***	*	***				
NNCW83	.1406	.0477	.3680	-.2281	.6885	.0790	1.0000		
	**	***	***	***	***	***	***		
NDS83	.3461	.7420	.8341	-.6195	.9079	.8168	.5933	1.0000	
	***	***	***	***	***	***	***	***	
NEEDS83	.7079	.7343	.6590	-.4194	.7779	.7105	.5090	.8828	1.0000

n=103, except 3 and 4 year olds per 1,000 population 1981-1990 (CTP) where n=95.

Significance levels:

* 0.05 or better
** 0.01 or better
*** 0.001 or better

Table 4.22: Correlation Between Indicators of Need 1984

	[Breadth Need]	[Depth of Need						]	[Total Need]
	CTP84	CLASS84	NLONE84	NLGE84	NPPR84	NNCAR84	NNCW84	NDS84	NEEDS84
CTP84	1.0000								
	***								
CLASS84	.4781	1.0000							
		***							
NLONE84	.1799	.5589	1.0000						
		***	***						
NLGE84	-.0876	-.4979	-.6153	1.0000					
	**	***	***	***					
NPPR84	.2670	.4367	.7085	-.5257	1.0000				
	**	***	***	***	***				
NNCAR84	.3649	.8217	.7692	-.7267	.5698	1.0000			
			***	*	***				
NNCW84	.1554	.0233	.3557	-.2427	.6943	.0849	1.0000		
	***	***	***	***	***	***	***		
NDS84	.3951	.7280	.8380	-.6532	.8940	.8214	.5938	1.0000	
	***	***	***	***	***	***	***	***	
NEEDS84	.7411	.7308	.6615	-.4683	.7640	.7284	.5000	.8857	1.0000

n=103, except 3 and 4 year olds per 1,000 population 1981-1990 (CTP) where n=95.

Significance levels:

*	0.05 or better
**	0.01 or better
***	0.001 or better

Table 4.23: Correlation Between Indicators of Need 1985

	[Breadth Need]	[Depth of Need						]	[Total Need]
	CTP85	CLASS85	NLONE85	NLGE85	NPPR85	NNCAR85	NNCW85	NDS85	NEEDS85
CTP85	1.0000								
	***								
CLASS85	.4789	1.0000							
	**	***							
NLONE85	.3349	.5575	1.0000						
	**	***	***						
NLGE85	-.2669	-.5173	-.6597	1.0000					
	***	***	***	***					
NPPR85	.4648	.3920	.6831	-.5268	1.0000				
	***	***	***	***	***				
NNCAR85	.4455	.8155	.7941	-.7530	.5446	1.0000			
	***		***	**	***				
NNCW85	.3397	-.0012	.3402	-.2588	.6956	.0910	1.0000		
	***	***	***	***	***	***	***		
NDS85	.5589	.7122	.8399	-.6884	.8747	.8255	.5945	1.0000	
	***	***	***	***	***	***	***	***	
NEEDS85	.8176	.6800	.7006	-.5421	.7969	.7205	.5690	.9123	1.0000

n=103, except 3 and 4 year olds per 1,000 population 1981-1990 (CTP) where n=95.

Significance levels:

*	0.05 or better
**	0.01 or better
***	0.001 or better

Table 4.24: Correlation Between Indicators of Need 1986

	[Breadth Need]	[Depth of Need						]	[Total Need]
	CTP86	CLASS86	NLONE86	NLGE86	NPPR86	NNCAR86	NNCW86	NDS86	NEEDS86
CTP86	1.0000								
	***								
CLASS86	.4899	1.0000							
	***	***							
NLONE86	.3610	.5575	1.0000						
	**	***	***						
NLGE86	-.2944	-.5353	-.6597	1.0000					
	***	***	***	***					
NPPR86	.4374	.3407	.6472	-.5221	1.0000				
	***	***	***	***	***				
NNCAR86	.4581	.8066	.8182	-.7795	.5112	1.0000			
	***		***	**	***	***			
NNCW86	.3365	-.0254	.3212	-.2763	.6910	.0972	1.0000		
	***	***	***	***	***	***	***		
NDS86	.5659	.6948	.8396	-.7243	.8485	.8290	.5953	1.0000	
	***	***	***	***	***	***	***	***	
NEEDS86	.8255	.6661	.7054	-.5733	.7640	.7186	.5662	.9073	1.0000

n=103, except 3 and 4 year olds per 1,000 population 1981-1990 (CTP) where n=95.

Significance levels:

* 0.05 or better
** 0.01 or better
*** 0.001 or better

Table 4.25: Correlation Between Indicators of Need 1987

	[Breadth Need]	[Depth of Need						]	[Total Need]
	CTP87	CLASS87	NLONE87	NLGE87	NPPR87	NNCAR87	NNCW87	NDS87	NEEDS87
CTP87	1.0000								
	***								
CLASS87	.4898	1.0000							
	***	***							
NLONE87	.4567	.5506	1.0000						
	***	***	***						
NLGE87	-.4160	-.5511	-.7425	1.0000					
	***	***	***	***					
NPPR87	.5342	.2829	.5990	-.5093	1.0000				
	***	***	***	***	***				
NNCAR87	.5039	.7950	.8408	-.8055	.4716	1.0000			
	***		**	**	***				
NNCW87	.4591	-.0487	.2984	-.2949	.6989	.1035	1.0000		
	***	***	***	***	***	***	***		
NDS87	.6681	.6758	.8364	-.7599	.8143	.8319	.5965	1.0000	
	***	***	***	***	***	***	***	***	
NEEDS87	.8750	.6259	.7176	-.6205	.7534	.7043	.6056	.9149	1.0000

n=103, except 3 and 4 year olds per 1,000 population 1981-1990 (CTP) where n=95.

Significance levels:

* 0.05 or better
** 0.01 or better
*** 0.001 or better

Table 4.26: Correlation Between Indicators of Need 1988

	[Breadth Need]	[Depth of Need						]	[Total Need]
	CTP88	CLASS88	NLONE88	NLGE88	NPPR88	NNCAR88	NNCW88	NDS88	NEEDS88
CTP88	1.0000								
	***								
CLASS88	.4395	1.0000							
	***	***							
NLONE88	.4465	.5448	1.0000						
	***	***	***						
NLGE88	-.4496	-.5634	-.7425	1.0000					
	***	*	***	***					
NPPR88	.5265	.2196	.5375	-.4864	1.0000				
	***	***	***	***	***				
NNCAR88	.5067	.7808	.8612	-.8296	.4220	1.0000			
	***		**	**	***				
NNCW88	.5002	-.0708	.2719	-.3142	.6578	.1097	1.0000		
	***	***	***	***	***	***	***		
NDS88	.6816	.6553	.8299	-.7935	.7709	.8339	.5980	1.0000	
	***	***	***	***	***	***	***	***	
NEEDS88	.8770	.5986	.7072	-.6613	.7200	.7148	.6206	.9232	1.0000

n=103, except 3 and 4 year olds per 1,000 population 1981-1990 (CTP) where n=95.

Significance levels:

*	0.05 or better
**	0.01 or better
***	0.001 or better

Table 4.27: Correlation Between Indicators of Need 1989

	[Breadth Need]	[Depth of Need						]	[Total Need]
	CTP89	CLASS89	NLONE89	NLGE89	NPPR89	NNCAR89	NNCW89	NDS89	NEEDS89
CTP89	1.0000								
	***								
CLASS89	.4287	1.0000							
	***	***							
NLONE89	.5144	.5373	1.0000						
	***	***	***						
NLGE89	-.5489	-.5707	-.7983	1.0000					
	***		***	***					
NPPR89	.5487	.1523	.4630	-.4513	1.0000				
	***	***	***	***	***				
NNCAR89	.5556	.7641	.8787	-.8497	.3633	1.0000			
	***		*	**	***				
NNCW89	.5579	-.0910	.2418	-.3337	.6266	.1159	1.0000		
	***	***	***	***	***	***	***		
NDS89	.7481	.6073	.8178	-.8109	.7234	.8339	.6060	1.0000	
	***	***	***	***	***	***	***	***	
NEEDS89	.9063	.5387	.7061	-.6923	.6826	.7088	.6470	.9266	1.0000

n=103, except 3 and 4 year olds per 1,000 population 1981-1990 (CTP) where n=95.

Significance levels:

* 0.05 or better
** 0.01 or better
*** 0.001 or better

Table 4.28: Correlation Between Indicators of Need 1990

	[Breadth Need]	[Depth of Need						]	[Total Need]
	CTP90	CLASS90	NLONE90	NLGE90	NPPR90	NNCAR90	NNCW90	NDS90	NEEDS90
CTP90	1.0000								
	***								
CLASS90	.3795	1.0000							
	***	***							
NLONE90	.4492	.5280	1.0000						
	***	***	***						
NLGE90	-.5748	-.5713	-.8061	1.0000					
	***		***	***					
NPPR90	.4893	.0838	.3774	-.4035	1.0000				
	***	***	***	***	**				
NNCAR90	.5270	.7451	.8924	-.8631	.2964	1.0000			
	***		*	***	***				
NNCW90	.5668	-.1090	.2086	-.3522	.5854	.1217	1.0000		
	***	***	***	***	***	***	***		
NDS90	.7206	.5841	.8038	-.8331	.6637	.8335	.6079	1.0000	
	***	***	***	***	***	***	***	***	
NEEDS90	.8955	.5071	.6686	-.7285	.6255	.7031	.6599	.9230	1.0000

n=103, except 3 and 4 year olds per 1,000 population 1981-1990 (CTP) where n=95.

Significance levels:

*	0.05 or better
**	0.01 or better
***	0.001 or better

Table 4.29: Correlation Between Indicators of Need 1991

	[Breadth Need]	[Depth of Need						]	[Total Need]
	CTP91	CLASS91	NLONE91	NLGE91	NPPR91	NNCAR91	NNCW91	NDS91	NEEDS91
CTP91	1.0000								
	***								
CLASS91	.4318	1.0000							
	***	***							
NLONE91	.2678	.3348	1.0000						
	***	***	***						
NLGE91	-.41158	-.5191	-.7711	1.0000					
	**		***	***					
NPPR91	.2774	.1594	.5104	-.5746	1.0000				
	***	***	***	***	***				
NNCAR91	.4219	.6273	.8815	-.8948	.5208	1.0000			
	***		***	***	***	***			
NNCW91	.4347	.0129	.4539	-.5569	.7383	.4182	1.0000		
	***	***	***	***	***	***	***		
NDS91	.4934	.4773	.8007	-.8585	.8148	.8676	.7830	1.0000	
	***	***	***	***	***	***	***	***	
NEEDS91	.8188	.5391	.5858	-.7503	.6630	.7168	.7190	.8654	1.0000

n=115.

Significance levels:

* 0.05 or better

** 0.01 or better

*** 0.001 or better