

THE GEOGRAPHY OF CHILDREN

AND

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INTRODUCTION

Whether Geographical behavior begins with a baby's first exploration of its own body, its spatial experiments in coping for its mother's attention, or when it first crawls away from the "nest," it must surely be agreed that human geography begins in childhood. Why then has so little been written by our profession on the geography of children? Clearly research questions in relation to them have been considered trivial. Children have until recent years been ignored as a suitable population for basic research, leaving them to that small, and rather isolated, branch of geography called geographic education (Bartz, 1972; Graves, 1975). This is an error, for our greatest period of geographical exploration and learning is that found in each of us, in our childhood. This paper is designed to illustrate some of the developments in the study of children since the beginning of "behavioral geography" approximately fifteen years ago.

Beyond the continuing research on geographic education which is almost entirely directed to the formal setting of school classrooms, it is now possible to identify two areas of basic research with children which are unequivocally geographic even if much of the work is not being done by geographers. First, there is a growing body of literature on the environmental behavior of children, particularly

concerned with spatial activity and use of the landscape. Much of this research has been conducted by planners, but it is nevertheless geographic. Second, there is an expanding literature on the development of children's knowledge of the geographic environment, most of it being focused on children's understanding of the spatial location of phenomena in the landscape. Although geographers have played a key role in igniting this research direction, the fire is being fed mainly within developmental psychology. I will treat each of these two fields in turn, reviewing what kinds of geographic questions have been addressed, in what ways, and some of the exciting challenges for those geographers who would join this research effort.

THE GEOGRAPHY OF CHILDREN

After reviewing psychological theory and research and carrying out a little research myself on children's understanding of spatial relationships in the geographic environment, I realized that for our theories to advance, more needed to be known about children's spatial behavior (Hart & Moore, 1971; and Introductory chapters of Hart, 1978). I was shocked to discover that not only had geographers ignored this question but that there were no studies of children's spatial behavior in their everyday outdoor environment by any discipline.¹

¹ I was aware of a pre-war German study (Muchow and Muchow, 1935) but this is only now being translated (see Childhood City Newsletter, 1981, for progress report).

Ironically, I discovered, at the same time, a monograph on baboon ecology (Altman & Altman, 1968). So much more advanced was the understanding of baboons' spatial behavior than that of human children that these investigators were hypothesizing the relationship of their spatial behavior to their spatial knowledge even though the baboons could not speak or otherwise represent their knowledge! The failure of psychology to have investigated children's geographic behavior was primarily due, I believe, to a methodological determinism. Almost all of the naturalistic studies of children were observations of behavior in the classrooms of the earliest grade levels of school (see review by Wright, 1960). It is more difficult to observe older children, particularly when they are ranging over large areas of outdoor space, than in the enclosed setting of a classroom. Nevertheless, by reviewing the many separate domains of psychology, nuggets of theory relevant to a geography of children can be found. Some of the more valuable ones are reviewed below (for a more comprehensive account see appendices in Hart, 1979).

Through the observation of infants and interviews with children's parents, Gesell and colleagues (Gesell, 1940; Gesell, Ilg & Ames, 1946) gave us a straightforward account of the normative phases of children's behavioral development, one of which was locomotor development, including the use of different means of transport. While of documentary value, this research tells us little of theoretical interest to the geography of children; it is a simple

average age-related charting of the occurrence of behaviors.

I found some psychoanalytic speculation of interest (e.g. Bettelheim, 1969; Erickson, 1963; Searles, 1959; Schactel, 1959; Reviews in Appendices of Hart, 1978), but the empirical research of John Bowlby on the attachment behaviors of mother and child was the most relevant (Bowlby, 1969). Through naturalistic observations of mother-child interaction, Bowlby demonstrated how the child's gradual exploration away from the mother is a negotiative developmental process for both parent and child. Applying this model to the environment with home as the secure base, it is clear that one needs to study not only child development but child-with-parent development for a complete understanding of a child's gradual engagement with the geographical world. For example, it has been found in experimental situations that children will explore more readily if their mother is present, a difference which becomes particularly marked when a strange person is present or when mother and child are in an unfamiliar place (e.g. Ainsworth, Salter & Wittig, 1969; Rheingold, 1969).

After arguing for the importance of children having a permanent home-base, Donaldson and Aldrich (1970) in a review article on "Children and the Urban Environment" hypothesize that there is a developmental sequence in which the territorial range at one level of experience becomes the home base for the next stage of exploration: mother as home base for exploring the room is replaced by the

the room as home base for exploring the house, etc. This is similar to the developmental sequence of space needs theorized by the planner Doxiadis (1975). Margaret Mead in an article on "Neighborhoods and Human Needs" argued, however, that a permanent home base is not necessary to establish the "basic need" for continuity (Mead, 1966). She found through her extensive travels with her young daughter that the simple placement of the potty in a new room was enough to establish "home". Similarly the family car can be enough for many children when moving to a strange place. It is strange that this question of the role of the physical environment in helping establish a sense of permanence for children is not discussed more in the literature of clinical psychology (reviewed in Searles, 1959). A related area of theory, on the importance of "transitional objects" has been explored, however -- Christopher Robins' teddy bear, Winnie the Pooh, is the most famous of these special objects, but it is well known by parents in general that a few months after birth, infants are likely to become attached to some particular object or furry toy (Stevenson, 1956; Newson & Newson, 1968; 1978). Winnicott (1974), a psychoanalyst, has incorporated this phenomenon into theory on the child's struggle to bridge the gap from the egocentricity of early infancy to the recognition of an external world of adults with independent actions. A transitional object is, he believes, the first unchallenged area of experience which is neither the self or the mother. The most obvious

geographical relevance of this theory is that a transitional object, being effective in reducing anxiety related to separation from the mother, can be carried around and serve as an aid in the child's exploration away from the safe nest of the crib.

One group of researchers, the ecological psychologists, have for many years observed children in their everyday geographical-scale environment (e.g. Barker & Wright, 1951, 1955; Barker, 1968). Unfortunately, in spite of the promise of the term "ecological" these psychologists have not paid much attention to the spatial and physical properties of children's worlds. Like most other psychologists, the emphasis has been upon observing children's social transactions. There are exceptions, however, for sometimes the influence of the physical environment cannot be ignored (e.g. Gump et al, 1963). The importance of the physical environment becomes more clear when one allows children to represent their worlds through some medium instead of simply relying upon observation of them. A study of children's behavior in, and representation of, a small town in comparison to that of child residents of a large town led to some very provocative findings by the ecological psychologists (Wright, 1970).

There are many studies of child-rearing which use spatial restrictedness as one index of socialization practice (e.g. Whiting & Child, 1961; Landy, 1965). All of them rely upon interviews of

parents as their data source and the results are usually superficial. An exception is the remarkable series of books by psychologists Newson and Newson reporting different phases of their longitudinal research of child-rearing in Nottingham, England (Newson & Newson, 1963, 1968, 1976). By using open interviews and becoming very familiar with the child-rearing philosophies of individual parents they were able to balance and enrich the more traditional reporting of aggregate data with detailed descriptions from the parents themselves. Although children's spatial behavior and relation to the environment were not major focii of the research, in each of the books they emerge frequently as important factors in child-rearing. Particularly interesting are the numerous discussions of how these factors are differently seen by parents of the five different social classes investigated. It becomes clear from this research that not only objects, such as toys, but characteristics of the larger physical environment, including its spatial arrangement, are important in influencing the socialization of children.

There is one valuable piece of research carried out by a geographer specifically on children's spatial behavior (Tindal, 1971; Anderson & Tindal, 1972). An interview with second and fourth grade children in an urban ghetto and a suburban area of Baltimore used an aerial photograph to help obtain information on the child's "home range." In accord with her hypotheses, the ranges of the suburban children were larger and the ranges of the fourth grade girls in the suburban environment were less than those of the second grade

boys. Speculations were made to interpret these findings but more wholistic or ecological studies involving an in-depth understanding of the environment itself and other actors in it, particularly the parents and other child-caretakers, is required in order to provide a comprehensive account of the dynamic set of forces involved.

In an attempt to inform and build theory across the traditionally divided domains of child-environment research - spatial activity, spatial cognition, environmental perception and preference, and use of the environment -- I conducted a descriptive developmental study of children's place experience in a New England town (Hart, 1978). By taking an integrative look at both the geography of all of the towns' children and their individual geographies, some contributions to existing theory were made possible. In the realm of spatial exploration it was surprising to find that the most frightening of places in the town were also among the most attractive to them; an observation not so surprising when one recalls one's own childhood or some of the more successful children's books such as *Huckleberry Finn*. A more important discovery was the necessity of thinking of children's spatial ranges as the product of negotiation between parent and child. Planners and designers have frequently failed to recognize the interactive nature of child-parent (or caretaker) relations in their housing guidelines, particularly in the many critiques of high-rise housing (e.g. Department of Environment, 1973).

These professionals write of the need for mothers to be able

to watch over their children, as though children themselves feel no need to maintain contact with a caring adult; parents, in fact, commonly set spatial range rules around the needs and demonstrated readiness of their children, rather than requiring the their children to meet their rules. Seen this way, the solution is not to simply design housing areas to guarantee the abilities of parents to watch over their children.

Confirming the findings of Tindal, described above, boys' spatial ranges were significantly larger than those of girls. It is remarkable that such dramatic sex differences in experience had not been noted by child psychologists -- a reflection of the fear of research beyond the laboratory, and the preoccupation with age as the critical variable. Opportunities to manipulate the physical environment were also much less for girls in the town. I discovered that toys, tools, play equipment and landscape qualities were seen by parents as important "tools" in their children's socialization. This became more obvious to me as I began to notice social class differences in the design and layout of space around the homes and in the provision of toys. Related to different ideologies and philosophies of child-rearing, the home landscape looked completely different in the various neighborhoods of the town. The manual-working families allowed their children to use the landscape around their home freely in their play. They commonly encouraged resourcefulness in the use of materials by buying them tools and other "working" toys such as pulling wagons or fishing rods. In contrast,

the landscape of the middle-class professionals' homes was manicured and controlled to such a complete degree that their use of the environment was limited to specific sites and specialized toys and equipment. In an unsystematic manner I was observing the use of the physical environment as a tool in socialization; this is a valuable unexplored area for pursuit by any geographers interested in the role of the environment in social and cultural reproduction.

Most other research has been done by urban planners, landscape planners and architects, sometimes with the assistance of sociologists (see Department of the Environment, 1973, for a summary of the most comprehensive of these; reviews in Hart, 1978, appendix; and Moore & Young, 1978). Unfortunately, the research by planners is usually of the observational survey type and hence suffers from superficiality -- observers simply record the location, sex and approximate age of children and their activity according to some gross category of play. Little or nothing can be said from this research about the children's spatial behavior because their identity and hence home location is not known. Also etic categories of landscape and behavior are used rather than the children's own categories.

Other research, also motivated by a desire to influence planning policy and environmental design for children, has used interviews instead of, or in addition to, observation (Southworth, 1970; Bussard, 1974; Chombart de Lauwe, 1976; Lynch, 1977; Moore, 1982). This

research integrates this section of the paper with the second section on "Children's Geographies," but its impact has been greater on environmental planners and designers than on psychologists and educators and so it is primarily discussed under this first section. The research includes children's knowledge of landscapes, their accessibility to and use of places, and their evaluation of them, primarily in terms of their suitability for play. Unfortunately most of this research is of the case study variety, and hence is of limited utility in guiding planning and design. Two recent exceptions are by planners: the comparative work of Robin Moore (1982) on children's perception and use of three very different English landscapes, and Kevin Lynch (1977) in an UNESCO-supported study of children's landscape perception and use in four cities in Australia, Argentina, Poland and Mexico. The more recent research by Lynch also included broader questions of children's cognition of the social and economic state of their neighborhood and their assessment of their own future in relation to these settings (Lynch, 1977). While very suggestive, none of these studies makes specific links to the objective economic conditions of the children's families. Also, like the rest of our research, it is not clear how they can help guide the way to change in the quality of children's lives. It should be noted that all of this research, including the UNESCO study, suffered from extremely limited budgets; there still has not been, to my knowledge, a funded project of any large scale on the geography of children.

Van Vliet recently completed a study of suburban and urban children's neighborhood perceptions which is a beginning for the kind of comparative research we need (Van Vliet, 1981). One hundred and sixty-eight children from urban and suburban Toronto responded to forced choice polar adjectives describing their neighborhood and answered open-ended questions concerning their neighborhood and the larger urban environment. The study confirmed some of the expectations generated by the largely less comparative literature of the past. The suburban children, for example, described their neighborhood more often as boring, and safe, and city children more commonly referred to unfriendly people, noise and dirt as disliked qualities of their neighborhood. There were, however, some more intriguing findings. More city children had places in their neighborhood where they were afraid to go than did suburban children, but more of the suburban children were afraid of the larger urban environment beyond their residential neighborhood. The most likely interpretation is that the city children had greater knowledge and competence in facing this wider environment. Such speculation raises exciting possibilities for research. Even more useful findings were achieved when the investigator went beyond the simple comparison of urban and suburban to discover what specific variables in the residential area might be important. The children were re-categorized on the basis of such factors as the density of peers living around the home and the variety of land-use types available in close proximity, and analyses of variance on the children's

responses was computed. The findings are interesting: children from neighborhoods with lower densities had fewer friends and complained of a shortage of friends as a disliked feature of their neighborhood; children living in neighborhoods with a greater number of recreation and assembly places and institutional facilities such as fire stations and community centers knew more adults. We need more such thoughtfully designed research to help us discover what specific environmental features are important to children and teenagers. It would be ideal if such quantitative analyses could be supplemented with more qualitative participant-observer research with a smaller number of the same children. Perhaps then we might move beyond the polar comparisons of these two types of research approach as "hard but irrelevant" and "soft but sensitive" to a self-critical kind of research which fears the possible superficiality of aggregate survey research and avoids the naive generalizing of descriptive case studies, by combining both.

Geographers have traditionally been concerned with large spaces. When I first designed the research in a New England town, I began at the doorsteps of the children's homes. This was probably not a serious error for the New England town I chose to investigate, but for my current research in New York City it would be a gross mistake (Hart, 1978; Hart & Chawla, 1981). It is crucial to understand the relationship of indoor to outdoor use of space by

children; the reduction of freedom to use the out of doors in urban areas is probably one of the most important changes in children's lives this century. To understand this change, the reasons for it, and its impact on children, we need to conceptualize their total space use, making no arbitrary scale or territory distinctions: geography merges with architecture.

One underused source of data is literature, including childhood autobiographies (special issues of Childhood City Newsletter on "Environmental Autobiographies, 1979; and review paper by Chawla, 1982). The major problem in turning to literature as a source of insights about children's geographical worlds is that the writers form an extremely biased sample; few of those who have published as adults grew up in very poor families. One alternative is to turn to children's own writings; there are a number of general anthologies (e.g.

Cornish & Dixon, 1969). It is regrettable that all of the studies of children's environmental perceptions have shied away from incorporating such self-expressions into their research, no doubt because they are not thought to be part of the battery of accepted methodologies in social science. One unique study, however, asked adults about their childhood memories of their city environment (Lukashok & Lynch, 1956). The research is informal and modest. Quite rightly it begins with a warning not to see memory as simply an accurate but partial photograph of the past but one that has been colored-in and modified over the years. Nevertheless, places were recalled with vivid detail and there were strong similarities, giving the authors

confidence that some valid generalizations could be made. When contrasted with the reports of the observational land-use studies described above, it is clear that they better capture the qualities of places which are important to children and also reveal places commonly hidden from an observing social scientist. The study obtained particularly vivid records of places free from adult authority, not specially planned for children and suitable for modification, physically and imaginatively.

William Bunge argued forcibly in the late 1960s and early 1970s for the need to study the environmental forces impacting the lives of what he considered our largest minority -- children. He demonstrated what a research program in the geography of children might look like and what its value might be through a series of small studies in Detroit (Colvard, 1971). Current research lacks the powerful political intentions of Bunge's work. He contrasted not only children's "perceptions" but also the objective conditions of their environments. For example, one simple study was a mapping of negative landscape elements (broken glass, garbage, etc.) in a few blocks of a Black ghetto in the city of Detroit, contrasted with the mapping of the same elements in a similar area of a Detroit suburb. Similarly, other maps show the relationship between the number of traffic accidents involving children and the racial distribution of the population. The investigators also attempted to balance this outside view with "inside" descriptions by teenagers of the environment of the ghetto. The work expanded to Vancouver

and later to Toronto, but unfortunately did not come to have the impact on the public which it was meant to, nor did it have much impact on other research. The orientation was original and had the potential of influencing policy-makers in both public participation and information¹. It probably failed for a number of reasons. While it was overtly more relevant than most other research has been, it was methodologically sloppy and too subject to rhetoric.

A major problem with current research is that it is not clear, even when we find out how children discriminate and use the landscape, what this should mean for planning and design practice. What do we use as our guide for what children should have available for them? The children's statements? The parents' ideas? Or some summary extracted from the child psychology literature? This question is usually not discussed. My own belief is close to that of Bunge. Landscape planning for children should be carried out at the community level where it can be culturally and environmentally sensitive to local demands. The role of research should be to help reveal how the environment is currently used and perceived by children and parents, and to offer some commentary from the collective

¹ A valuable spin-off from this work is a book for schoolteachers by Tom Scanlan with some of the ideas gleaned from his work with the Toronto Geographical Expedition. Neighborhood Geography (1978) covers exercises which enable children to look more closely at their own environments and is very close to the tradition of B.E.E., to be described below.

wisdom of behavioral science but to allow parents with their own differing values for child-rearing to play the major role in the decisions, ideally with their children participating (see special issues of Childhood City Newsletter on Participation, 1981a, 1981b, 1982). Bunge's approach should be applauded for avoiding the naive idealistic stance of collecting data on children's environmental perception and behavior in the hope that it will be picked up by some concerned planner. His more effective route of achieving local action and reaction by developing research tools to be used in the hands of local residents themselves is being more modestly pursued by geographers and others in the U.K., to be described below.

CHILDREN'S GEOGRAPHIES

It is necessary to begin this review by laying out some of the theory provided for most of the research in "developmental geography" by the great investigator of children's cognitive¹ development, Jean Piaget. Piaget has unwittingly had the greatest influence on research in children's geographic thinking in North America. It is surprising for many to discover that in spite of his powerful influence in the fields of child psychology and education, these disciplines were not his major concern. He was

¹ Throughout this paper the terms "cognition" or "cognitive" may be thought of as equivalent to thinking or knowing.

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and knowledge of the workings of the everyday physical environment into experimental designs with minimal sets of physical elements. This was done in order to tighten his understanding of children's logical thinking and thereby provide a general developmental account of the structure of children's thought, regardless of the content.

In the 1940s Piaget wrote two additional books of great relevance to developmental geography: The Child's Conception of Space (Piaget and Inhelder, 1948) and The Child's Conception of Geometry (Piaget, Inhelder and Szeminska, 1948). These books have been recognized and used a great deal by geographers and educators, and recently by developmental psychologists concerned with children's understanding of maps and their mental constructions of spatial relations or "cognitive maps" (reviews by Hart and Moore, 1971 and Seigel and White, 1975).

Through his emphasis on the structure of children's thought, Piaget left behind any concern with the content of their thought, that is, the particular phenomenon being discussed with the child and his or her interest in it, or lack thereof. Susan Isaacs was one of the early critics of this contentless research in terms of its relevance for educators (Isaacs, 1930, 1933). She felt that it was necessary to investigate children's affective development simultaneously with their ability to logically construct the world, that is, we need also to be concerned with children's interests in the world. This criticism of Piaget's educational relevance

remains true today and can equally be applied to the profession of education as a whole. It is for this reason that we have hundreds of individual experiments on the development of the structure of children's spatial thinking (Elliot, 1975; Hart & Moore, 1973; Siegel & White, 1975; Liben et al, 1981) and hopelessly few integrated studies of how children explore and understand the large-scale spatial environment, what features they selectively engage with and what questions they spontaneously ask (reviewed by Hart, 1979 and Moore, 1982). It would therefore be a mistake to rely solely on psychology as our primary indication of what a relevant developmental geography should look like. Let us rather turn to the close observations of children in their natural settings as the guide to our design and interpretation of experimental research and to the elaboration of theory.

In 1934 a remarkable little book was published by Lucy Sprague Mitchell called, Young Geographers: How They Explore the World and How They Map the World. Lucy Sprague Mitchell has been an important figure in the development of progressive ideas in education. She believed geography to be a very important part of elementary school curricula. Her book contains a table entitled, "Notes Towards a Chart of the Development of Geographic Thinking and Tools." Although she describes this table as "sketchy, superficial and a bit pompous," it represents a clear statement of the direction we as geographers should have been following in studying children's geography. The table charts the progressive stages of children's

geographic interests, orientation, and understanding of geographic relations, and the modes used for representing the environment: lenses and muscles, toys and blocks, picture-drawing, written language and maps. In the half century since this informal charting of observations and ideas of an enthusiastic and insightful educator, we have done little in any systematic or coordinated manner to improve our understanding of the development of children's exploration and knowledge of the geographic environment. There are, however, observations and conceptualizations about developmental geography scattered in a wide variety of places. There is an existing body of theory and method in developmental psychology to draw from and the promise of making important contributions to educational practice.

The need for a research program is particularly great in the United States where geography as an elementary school subject is almost unknown and where map skills are dealt with so poorly that most children do not have a single atlas available in their classroom. The National Council for Geographic Education (unfortunately isolated from the Association of American Geographers) and its periodical, the Journal of Geography, provides a forum for educators. The emphasis, however, is entirely upon education in formal, or institutional settings, rather than upon basic research in children's geographic learning.

Elementary geographic education is nothing if not an interactive process between the curriculum and the geographic interests

and understanding of the child. Hence, research in elementary school geographic education should reflect both sides of this interactive process. This is not the case. The bulk of attention continues to be placed on the side of curriculum development based on the structure and content of geography with little regard for the spontaneous development of children's geographic experiences, interests, and thoughts. Educational research and practice still reflect little awareness that children learn outside as well as inside the schools (Carr & Lynch, 1968). We need research programs which address children's spontaneous geographic questions. What follows is a review of those few sub-areas of geography which have been considered by the small number of investigators who listen to children.

Physical Geography

Given the crude state of our knowledge of children's understanding of physical geography, a good beginning would be to replicate some of Piaget's 1920s work on the child's conception of the weather, rivers, mountains, etc. When I first drafted a proposal for the A.A.G. on children's geographic learning in 1974, no research had been carried out on the value of direct experience in children's geographic learning of earth science concepts. "Do children not learn earth science from manipulating, observing and experimenting with mini-landscapes of dirt, sand, mud, water, sticks, stones, etc.?" I asked. "Are not ponds, streams, gutters, gardens,

dirt piles, small-scale eco-systems -- laboratories for children's dabblings, observations and questions?" I didn't realize that Dennis Wood, also influenced as a student at Clark by the same child advocates as I was -- James Blaut, David Stea and William Bunge -- was watching his own and his neighbors' children playing with dirt and mud (Wood, 1976). He seemed a little disappointed that so little of their play involved the modelling of geomorphic or geographic features of any kind, but this was a study conducted over a short period and in only one environment -- Raleigh, North Carolina. I have noted that sub-cultures of children have fads which emphasize one kind of play for a whole season, only to change dramatically the next year. For the pre-school children of his study the main focus was cake-making. My own observations, however, revealed a large amount of landscape construction (Hart, 1978). Hopefully, Wood will continue his research with a larger population in a range of different environments as he has proposed.

Piaget specifically investigated children's understanding of physical systems and processes of the geographic environment in his early books, first published in 1926, 1927 and 1937 (Piaget, 1967, 1960, 1954). A summary of his theory is useful because it remains the most comprehensive, empirically-based theory. He found that children are "both nearer to and farther from the world of objects than we are" (Piaget, 1954, p. 254). They are nearer to it because of a tendency to accept the world as it appears and through a projection of their own feelings into it. At the same time, these

tendencies create confusions that distance them from the intellectually apprehended physical work in which adults live most of the time.

For Piaget, the first question is one of "realism," that is, to what extent a child distinguishes the self from the external world. "Realism" should not be confused with "objectivity." The achievement of objectivity involves maximizing one's awareness of the countless intrusions of the self in everyday thought. In contrast, realism means ignoring the existence of the self and thereby regarding one's perspective as absolute. Piaget described three complementary processes involved in the evolution of reality from three to eleven years of age. The first is the progressive differentiation of self from the external world, towards objectivity. Objectivity is never completely achieved; there always remain "adherences," less differentiated fragments of experience. The following five adherences are actually inseparable from one another. "Participation" is the feeling in a very young child that the world is filled with intentions which merge with one's own, e.g. the sun and the moon follow as we walk and the clouds and wind notice us and obey us. "Animism," related to "participation," is the notion that things such as clouds have consciousness. "Artificialism" is the tendency of a person to think that everything is made for and by people. With "finalism" things simply end without their origins or consequences being noticed, and without being necessarily endowed with consciousness, e.g. a river flows so as to go into a

lake. "Force" is the idea that things make efforts through some kind of energy equivalent to a person's muscular force. With these adherences is "phenomenism," the idea that anything can produce anything: two facts observed together can be causally related.

With the growing objectivity that develops as a child frees the self from these adherences, there is a growing reciprocity with the perspective of others. Gradually a child realizes that his or her own perspective is unique; the classic example is the child who thinks the sun and moon are small globes following us just above roof level as we walk along the street!

The third process, from realism to relativity, is closely related to the achievement of reciprocity, described above. For young children everything has absolute substance and quality. Only gradually do they see phenomena as dependent upon each other and relative to us. They progressively realize that external forces determine the motion of natural objects and that these in turn are dependent upon other forces, forming together a universe of relations. Together with this growing awareness of the relativity of physical phenomena a child has a growing conception that his own ideas are relative to himself and to his personal evaluations of things.

In the many years since Piaget wrote these books there have been many criticisms. A central criticism is that what Piaget takes to be universal developmental uniformities from his research with

Swiss children should not be considered laws of nature for they are historically and socially determined (e.g. Vygotsky, 1960). For this reason, one should not expect animism, for example, to appear or disappear in the same way in all cultures for the dominant adult cultures themselves have different conceptions of their physical universe. Nevertheless, the kinds of misinterpretations of reality described by Piaget have been repeatedly found in children.

A small study by Kates and Katz (1977), geographers of Clark University, serves as a classic example of the rich data that can be gleaned by simply observing and listening to children, recording their spontaneous discussions and questions and then discussing with them their thoughts about a phenomena. In this case the subject was the hydrologic cycle as understood by four, five and six-year-old children attending a day care center in Worcester, Massachusetts. One of the authors had spent more than a decade investigating the adult world of water resources. Neither of them had experience in working with children, but they learned that children had such interest in the phenomena and talked so freely that it was easy and enjoyable to produce interesting results. Their work confirmed the sequences Piaget outlined on the understanding of physical systems, as described above, but with some interesting differences worthy of further study. The Worcester children of only four years of age had explanations which were less artificialist and more naturalist than those of Piaget, more similar to the six to nine-

year-old Swiss children. Whether these differences are due to the different environments of the two groups, the changing access to environments, or information through the media over the fifty year period between the two studies, etc., is entirely open to speculation at this time. Another interesting finding was that the children commonly constructed two separate unlinked cycles: a domestic water cycle and a cloud-rain or natural cycle. No doubt they had difficulty linking the two systems because the natural hydrologic cycle is impossible to observe due to the large scale, slowness and, at times, invisibility of the process. Such understanding, then, can clearly be influenced not only by the intellectual capacity of a child but by the information available. There is much room here for both pure research and interventional programs of education and research.

This research tells us that it is time for us to stop simply replicating Piaget's experiments to see by what age children can understand something. We need to open our research designs to be able to reveal the role of experience. I do not mean experience as reduced to the socio-economic class a child is from, but whether they live in a village or a city, how much they have travelled by car or by air, what access to visual media they have had, etc. In 1934 Lucy Sprague Mitchell wrote:

The kind of geography which we have found most natural to city children is human geography. The natural earth conditions are too overlaid with human modifications to make

physical geography an easy field of exploration in the city. In the country, even in the suburbs, children discover relationships which concern soil, erosion, elevation, the growth of plants and animals, at an earlier age than do city children. But for children before eight everywhere, work, the activities of people, hold more interest than natural phenomena. (Lucy Sprague Mitchell, 1934, p. 24)

No matter whether one agrees or disagrees with this statement, it is embarrassingly clear that it is at least an informed speculation. Moreover, it is disturbing that neither geographers nor psychologists have any empirical bases for confirming or denying it.

Human Geography

There has been, on the surface at least, great interest in teaching young children what is popularly termed "ecology," but there seems to have been very little research on the development of children's interest in, and conception of, people's use of the environment. I observed informally during my own study of children's place experience in a New England town, however, that children were extremely interested in recreating in their toy and dirt play on the ground the occupations of adults in their communities. I have observed two brothers, four and nine years of age, for example, spend hours playing at highway building in the dirt; the older boy recreating all that he has observed in passing workmen on the roads -- first laying a heavy course with stones and then layering it with dirt before making a smooth layer by mixing fine dirt with water to make a slushy, shiny tarmac; building retaining

walls with large stones at the bottom leading up to fine gravel at the top; finishing up by simulating a thunderstorm with a hose pipe spray to see how well his system holds up under "real" environmental conditions.

On another occasion, while observing a small army of children, all under ten years of age, playing seriously on a dirt/clay hillside, I asked a three-year-old what he was building. "The emergency dam," he told me indignantly as though anyone should know. He went on to explain how his channel and dam were designed to take the water should one of the upper dams, being built by older children break. No adults had talked with him or any of the children about the complicated system they were building. This kind of learning is not difficult to observe. If we engaged in this type of observation closely and systematically, we would be in a much better position to build theory and to pose better questions to children both in our further research and in our educational practice. Simply to observe the geographic content of children's spontaneous modelling in block corners, sand boxes, sidewalks, bedroom floors, etc., and to see if, and how, this varies according to the children's home environment and parents' occupations, etc., might be a valuable beginning.

In the United Kingdom, a small number of geographers, planners and educators have achieved a remarkably good integration of research with education and have shared this with each other, and with a large number of geography teachers through the Bulletin of Environmental

Education, published until very recently by the Town and Country Planning Association¹. Lucy Sprague Mitchell would be thrilled to see dozens of essays outlining ways that teachers can build classes around children's reflections on their own environmental perception and behavior, and through research with residents of their own local communities. The original inspiration for this comes from Patrick Geddes via Colin Ward, original co-editor of B.E.E. with Tony Fyson (see *Streetworks* by Ward and Fyson, 1973 for a summary book on the approach). The content of the articles, published almost every month for the past decade, clearly reflects the growth of behavioral geography. Some of the writers, such as Brian Goodey (1972) are geographers, while other regular writers such as Jeff Bishop (1976) have been directly influenced by research in behavioral geography. The work goes beyond what Sprague-Mitchell called for, carrying children into an understanding of the social, economic and political forces which influence people's relatedness to the environment and how environmental decisions are made which affect them and their neighborhoods. With this kind of participatory work with children, research and practice become one and the same thing. There are excellent opportunities in the U.S.A. to collect data while simultaneously providing enjoyable experiences for children and teachers because the nation's schools are starved for geographic methods and

¹ B.E.E. has recently been renamed Streetwork. It is still available ten times a year (see bibliography).

content. For example, a recent project of ours involved thirty schools in four states in which classes of children were twinned with classes with children from very different environments. They corresponded for an entire school year in order to compare their own local environments, what they are like and how they are changing (Hart & Perez, 1980). The project was very successful for the children and teachers, and the letters, drawings, models and interviews are providing us with valuable insights into how rural, suburban and city children perceive their own environments and stereotype others.

Cognitive Mapping (1)

The largest amount of research in "developmental geography" has focused on children's understanding of the spatial location of phenomena in the landscape. With the genesis of behavioral geography in the late 1960s, it was too tempting to ignore the ready-made term "cognitive map" (Tolman, 1948) and to adopt this term as a symbol of the professions entry into the terrae incognitae of the mind (see Downs & Stea, 1973, for a history and summary). This quickly led to the conceptual misunderstanding that representations of the geographic environment were necessarily map-like and singular. Attempts to clarify the term or extinguish it are periodically made (e.g. Hart & Moore, 1973; Downs & Stea, 1973; Downs, 1981), but still there is a strong tendency, even in the research, to think of the cartesian map as the model for our mental representations.

In 1968 Professors Blaut and Stea founded the "Place Perception

Project" at Clark University (Blaut, 1969; Blaut & Stea, 1969, 1971; Blaut, McCleary & Blaut, 1970; Stea & Blaut, 1970, 1973). The Place Perception Project prepared an agenda for research in children's geographic learning, generated new theory, and conducted some provocative research on the early map language abilities of children. The observation that children learn mapping skills before they enter schools, and that, given the right media, teachers can tap into this ability, serves as a fine demonstration that geographic learning happens spontaneously and that the school-teacher's job is to be aware of this and to assist the process.

Without doubt the theory and research by Piaget and his colleagues on spatial cognition has had the greatest influence on research in spatial cognition of the geographic environment (reviews by Hart & Moore, 1973; Siegel & White, 1975; Hart, 1978; Moore, 1976; Piche, 1982). Piaget has amply demonstrated through a large number of experiments that children actively construct their spatial knowledge.

Children build schemas, sequences of behavior which are internalized in thought to become the basic building blocks of cognition. Intelligence for Piaget is internalized action. Four major periods of development were outlined by Piaget: the sensori-motor period from birth to approximately two years of age, during which an infant proceeds from reflex activity only, to coordinated actions in space. A child begins to internalize these behavioral schema and to enter into the pre-operational period at about two years of age. Now the

actions can be carried out symbolically but these mental operations on the spatial schema are only intuitive. For example, a child can reverse thinking only by starting again at the beginning of any sequence -- a cyclical rather than a true reversability with obvious implications for the learning of routes in geographic space. Thinking is egocentric, that is, a child has difficulty decentering from any one aspect of a situation. With the concrete operational period beginning around seven years of age, a child becomes capable of logical thought. For example, it now becomes possible to achieve true reversibility of thought, though these operations are still limited to real objects. The child no longer confuses his own point of view with that of others; different points of view, independent of the self, can be differentiated and coordinated into a comprehensive knowledge of spatial relationships. Entrance into the final phase identified by Piaget, the formal operational period, during adolescence, means that a child is no longer dependent upon the manipulation of real objects, it is now possible to operate strictly with ideas with some kind of language such as words, diagrams or abstract maps. This sequence of development has been investigated and challenged in hundreds of experiments by investigators around the world. In the U.S.A. much attention has been wasted upon arguments about how early a stage is reached and how this relates directly to teaching (see critique by Duckworth, 1982). In spite of the arguments, the major principles of Piaget's theory are now well accepted. The most important of these for

behavioral geography is the clear demonstration that even our adult understandings and representations of space result from the extensive manipulation of objects and from locomotion through environments, not as we might intuitively feel, from our "reading" of the environment.

There have been a large number of studies in the past decade, primarily based on Piaget's theory, on the development of children's representation of geographic space (see summaries and reviews by Hart & Moore, 1973; Siegel & White, 1975; Acredolo, 1976; Moore, 1976; Hart, 1978; Liben et al., 1981; Siegel & White, 1975). Some of this research has modified Piaget's experiments specifically for their relevance to geographic education (e.g. Tower, 1968, 1970). Most, however, has been conducted from within developmental psychology where it has grown to become a significant sub-field¹. Unfortunately, within this discipline, research suffers from a heavy reliance upon experimental simulation of the geographic environment and has made little attempt to build research upon the very different goals people have when they mentally represent places (Hart, 1981; Hart & Berzok, 1982). There are methodological reasons why cognitive developmental psychologists have not conducted more

¹ There were three separate sessions on spatial representation and way-finding in the last conference of the Society for Research in Child Development (1981).

naturalistic research in the large-scale environment (Piche, 1982). Many, including Piaget and his colleagues, argue that the best approach to cognitive development is to look at a child in the process of problem-solving, that is, while manipulating the phenomena. It is, of course, very difficult to do this with the geographic scale environment. The solution has been to simulate the geographic environment through the design of model settings, mazes, and the use of blindfolds. Consequently, the geographic environment has been reduced in scale and simplified to the point where the validity of the research suffers greatly. Research could benefit from more collaboration with geographers and environmental psychologists who are more experienced with field research designs and methods. In spite of this weakness, the research has managed to develop a network of researchers who are steadily moving forward through the development and testing of theory with some ingenious simulations of geographic spaces (e.g. Acredolo, 1976; Pick & Lockman, 1982; Siegel, 1982; Gauvain, 1982). The major debate between the incrementalists and the constructivists continues. They disagree as to whether spatial cognition is largely the result of the degree of experience with an environment, or whether it is due to the intellectual abilities which are applied to it (see arguments by Pick & Lockman, 1982; and Siegel, 1982; and review by Piche, 1982).

While research by developmental psychologists has completely ignored the important "content" side of spatial representation,

some of the work by geographers and planners described under "The Geography of Children" above, included "cognitive mapping" and looked simultaneously at what is represented as well as how phenomena are related one to another (e.g. Southworth, 1970; Lynch, 1977; Moore & Young, 1979; Hart, 1978; and Moore, in press). Developmental psychologists wishing to broaden their perspective on children's spatial cognition would do well to look outside of their field to these more ecologically valid kinds of descriptions of the child's spatial world. One important discovery they would make is that way-finding is not the only or even the primary reason that children represent to themselves the spatial properties of the large-scale environment. Among other reasons, we may hypothesize that a child learns about the geographic surroundings because they are intrinsically interesting.

The work of Tindal (1971) and Anderson and Tindal (1972), described under "The Geography of Children", on the spatial behavior and neighborhood mapping ability of children from different socio-economic backgrounds and ages was a valuable beginning to research on the influence of social, cultural, and environmental background on geographic experience and spatial knowledge. In a similar vein is the work of another geographer on the "home range and urban knowledge" of children (Andrews, 1973). As dissertation research, Michael Southworth with teenagers, and I with younger children and pre-adolescents, investigated simultaneously the relationship between spatial behavior and knowledge of the spatial

properties of the environment (Southworth, 1970; Hart, 1978).

This work now needs to go beyond the case study approach through the development of comparative methods.

Geographic Cognition Beyond the Local Environment

There has been much less investigation of children's spatial knowledge beyond the home environment. What conceptions do children have of places beyond the horizon? How do they organize different places and regions? and What role does the imagination play in these developments? Very little research or even theoretical speculation has been carried out on these questions. Peter Gould, a geographer, asked thousands of Swedish school children what place names they knew of (Gould, 1973; Gould & White, 1974). This might be an interesting area to investigate, but to do so one needs to be much more concerned with conceptual issues at such an exploratory stage of research. After manipulating the large amount of data, Gould found that more children knew more place names of larger places than of smaller places and that this place-naming ability is neatly predicted by a gravity model. This may seem elegant but it tells us little about children and their geographical worlds. We need to work with some of the conceptual expertise psychology has developed. Other information about the Swedish children than simply the location of their homes, for example, might have helped in providing some useful interpretation of the data.

Piaget and others investigated the development of children's concept of nation but this work was fitted into the rather narrow

question of the development of class inclusion abilities in children. (Piaget, 1924; Piaget & Weil, 1951; Jahoda, 1963, 1964). Piaget (1924) found when he asked children if they were Genevese or Swiss that "pre-operational children" (i.e. approximately 7 years of age or younger) responded in terms of "nominal realism," seeing Switzerland as a separate place alongside the one where they lived. During the "concrete operational stage" (from approximately 7 to 12 years of age) they visualized Switzerland as an area surrounding their city and only with the achievement of formal logical abilities, in Piaget's final stage (12 years and over), were children able to conceive of city and nation as part of a geographic hierarchy. Jahoda (1963 and 1964) conducted similar research with children aged 6 to 11, asking them about the relationship of towns and counties based on their home in Glasgow. The children's verbal answers could not all be fitted into Piaget's description of stages. He argued that children's understanding of spatial relations does not necessarily precede their understanding of nationality. When he gave their abstract two-dimensional forms to express the spatial relationship of nations their performance was inferior, suggesting that they were not fully understanding what they were verbally expressing. Jahoda had sample populations drawn from working class and middle class sectors of Glasgow (see also Stoltman, 1971). Here was a wonderful opportunity to investigate the influence of experience on geographic knowledge by simultaneously investigating differences in children's travel mobility, and access to media, etc.

Instead, Jahoda simply tells us that working class children performed worse on the tasks, leaving the reader to assume what they wish!

An example of what can happen when psychology and geography integrate can be seen in the excellent recent geography dissertation on "children's spontaneous geography" by Denise Piche. Piche went beyond the study of children's mental home range to include their conception of distant places and regions. This research was conducted more in the spirit of the constructivist investigator Piaget than has been true of other research in children's cognitive mapping. Rather than focussing upon the products made by children -- drawings, maps, or models -- she attended to the process of making them. Using a clinical interview approach, she asked them about places in their neighborhood and "elsewhere" and then proceeded with different questions for each child but always with the same intention of examining "how each individual divided the continuity of space into places, interpreted the names of places and land-uses and structured the continuity of geographic space, including how they hierarchically organized geographic concepts and finally explained, identified with, and judged the world" (p. 234). Piche's findings confirmed the main sequence of developments outlined by Piaget, but her findings offer a clear call to go beyond the almost total emphasis of current research upon the proximate environment. She argues that we should simultaneously investigate children's understanding of proximate and distant

space for "a correct conceptualization of here is necessarily related to a conception of 'elsewhere'." It is regrettable that more details of her analysis cannot be presented here for it reveals clearly how many very interesting questions remain to be explored on children's "spontaneous geography" beyond the home environment.

It is worthwhile pausing to ask why there has been such a narrow emphasis upon children's cognitive mapping when there are so many other important domains of geographic cognition to investigate. There are numerous possible explanations. One likely reason is the attractiveness of maps themselves. As Roger Downs has recently argued, it has been extremely difficult to convince investigators in the field that the map is only a visual metaphor for whatever our mental representations may be like (Downs, 1981). The map is the one tool and symbol geography has been able to hang onto as distinctly belonging to its discipline. It is small wonder that children's geographic research should begin with it. It would be good to be able to say that the spatial emphasis is the result of an applied orientation in the research such as map skill curriculum development, spatial orientation schemes, signing or public information for children. This is not the case. The major reason, I believe, is the result of the tendency of academia to establish sub-fields and blindly produce studies without asking each time, "what are the important questions to ask about children's geographic knowledge?" Closely related to this is a kind of methodological

determinism: if you have a good spatial cognition method, use it. Again, the love of maps is a good example -- there probably is no introductory behavioral geography class of students that has not been asked to draw a "mental map," usually without much critical attention to the meaning of such a product or how one goes about analyzing it. It is time for those of us in this sub-field of behavioral geography to return to the pioneering study, The Image of the City by Lurch (1960) and read the Appendix. Here one finds a rich description of the different possible reasons why people, including children, might want to mentally represent the spatial properties of the environment. There are many reasons and they do not all call for the same kind of cartesian map; in fact, it may be too circumscribed an approach to begin with the assumption that the primary image of a place is map-like at all. Shelley Pazer, a developmental psychologist at the City University of New York, is intrigued by some of the special questions children's geographic cognition brings to her field of children's concept formation (Pazer, 1982). She is investigating the development of children's concept of "city." Such phenomena raise exciting new questions for developmental psychologists. Rather than beginning with spatial organization of the city as the question and hence maps as the method, her research design remains open in order to reveal the relative roles of form versus function, an important debate in the literature of children's concept formation (see also Muntanola, 1982).

THE PLACE OF GEOGRAPHY IN FUTURE RESEARCH WITH CHILDREN

Other "Geographies of Children" and "Children's Geographies"

The research to date is better characterized by what it has not studied than through the small number of reports currently published. We know very little, for example, of children's social geography, commercial geography, natural resource knowledge and use, spatial diffusion of games and other cultural "inventions," the influence of early spatial experience or environmental experience on adult behavior, or children's changing conceptions of the universe, to name just a few.

Bridging the Gap Between Micro and Macro Research

There is a need for research which is "ecological" in Bronfenbrenner's sense of the term (Bronfenbrenner, 1977; 1979). Bronfenbrenner argues that for our research of children's lives to be ecological we must go beyond the naive interpretation of Kurt Lewin (1946) as a need to study a child in his or her total immediate context. Bronfenbrenner emphasizes the need to conceptualize research in such a way that different levels of analysis and different settings can be linked to one another. Micro level ecological studies such as children in playgrounds, for example, can be linked with studies in other settings like the home by doing research on the relationship of behavior in one setting with behavior in another

setting. He argues further, calling for study of the influence of non-child settings in which child-caretakers spend their time, notably the work-place, on the quality of their relation to children in children's micro-settings. By studying the relationship of these institutions, normally investigated separately, he believes we would be able to plan for, and assess the impact of new national or state level policies and institutional arrangements. While such a scheme sounds more feasible for policy-making in a socialist government than in the United States, this kind of thinking is refreshing from a psychologist. The role geography could contribute to such an ecological research endeavor is great. A particularly valuable development would be for behavioral geography with its concern for individual's experience of the environment, to join with those geographers who limit their research to the macro-economic/political analysis of social justice. Such a combination could lead to the kind of research on the geography of children called for by Bunge in which the forces behind variations in the availability, accessibility, and quality of resources for children are identified. Then, we would be in a position to make specific policy and planning recommendations for those children and families who most need our geographic expertise.

Geographic Learning Research for Geographic Education

Unfortunately, few educators or teachers follow the excellent lead of Lucy Sprague Mitchell (op. cit.), who built her educational program out of the geographic interests and activities of children

in her classrooms and those of her students and colleagues. Ideally, teachers would themselves each become investigators, building their teaching upon observations of their children and their spontaneous questions. There is also much room, however, for basic research contributions. This geographic learning research should not be harnessed to specific curriculum design questions; it should rather focus upon the questions children themselves have and how they proceed to find answers to them. This research would best be done collaboratively between geographers and developmental psychologists, working with educators to help interpret the findings for their relevance to educational practice. We must avoid the kind of isolated research endeavour which characterizes the current spatial cognition literature.

Research on the Geography of Children for Environmental Planning and Design

It is clear from the existing research reviewed that children have different land-use categories from those of adults. If we could develop a reliable comparative method it would be very useful in helping landscape planners and designers, particularly in the creation of new residential settings for children. They are currently operating with only the adult glossary of land-uses when the major users of outdoor open spaces are children. Recent attempts by Lynch (1977) and Moore (1982) with small comparative samples are a beginning. We now need to concentrate on validating some truly comparative methods. Our results would not be cookbooks for the provision of landscape resources for children, for this is not a

value-free enterprise. The research would, however, provide valuable insights for planners and designers of the very different scale and qualities of features valued by children. For the actual planning process, simpler participatory research would be ideal, particularly in the improvement of existing residential areas. The behavioral geographers would then find themselves in the dual roles of informed consultants summarizing what we know from existing research with children, and research coordinators establishing simple indices of children's existing spatial access to resources and obtaining land-use priorities from both children and parents. This would guarantee sensitivity to the particular culture or sub-culture and the local environment. Models for this kind of learning process are hard to find though the British Bulletin of Environmental Education has many valuable examples of ways to help children take part in planning and design.

The Physical Environment as an Agent in Cultural Reproduction

We need to build theory on human development through the environment not only for its value in understanding of children, but also because of the longer term question of cultural development in relation to the environment. Developmental psychology has focussed almost entirely upon the isolated investigation of physical, social and abstract cognitive development, leaving us with very little sense of how children's daily transactions with a dramatically changing environment are themselves changing and what the implications of these changes might be for children and for the future cultures they are in the process of creating.

American psychology has been distinctly non-materialistic and ahistorical. There are strong signs by many in developmental psychology of a desire to become more contextual. Particularly influential have been the recent translations of the writings of Soviet psychologists Vygotsky (1978) and Luria (1976). Cultural and behavioral geographers are in a good position to help developmental psychology move into field research, not necessarily dropping its concern with experimental research design, but leaving the "no-place" world of laboratories behind in recognition that children's engagement with the material world varies in ways which may have important consequences for their lives. Fifty years ago Luria set out, under Vygotsky's influence, to investigate the impact of different degrees of contact with technology and collectivization on peasant's thinking in Soviet Central Asia. By interviewing a cross-section of peasants with dramatically different degrees of removedness from the advancing Soviet culture, Luria was able to investigate the impact of historical changes in technology on people's consciousness. A related research design has been chosen by Cindi Katz, a geographer of Clark University, to investigate the impact of a changing economy and associated technological changes on children's environmental learning (Katz, 1979). A short time ago she returned from a village in the Sudan which has recently been transformed from a subsistence agricultural economy to a market-crop economy. Through ethnographic and ethnosemantic procedures she reconstructed with a small number of children an account of their agricultural knowledge. The research combines the

best field research traditions of cultural anthropology, micro-cultural geography, and behavioral geography with a Marxist analysis of major structural changes which it is hypothesized are impacting individual behavior and environmental learning. I hope the work of Katz will lead cultural geographers to realize that the study of children's environmental learning offers valuable access to the understanding of people's environmental knowledge and values and to the debate on the relationship between environmental practice, culture and consciousness.

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