Behavioral Studies on Environmental Perception by Japanese Geographers

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Abstract: Behavioral studies on environmental perception have been conducted by Japanese geographers since the 1970s, being stimulated by the studies in Anglophone countries. But most of the foreign geographers appear to know little about the development of Japanese research in this field. The aim of this paper is to introduce the behavioral studies on environmental perception in Japan to add their findings to the international inventory of behavioral geography. After briefly outlining the process of the development of behavioral geography in Japan, the empirical studies on environmental perception are reviewed dividing the subject into three aspects: designative aspects (e.g., information field, cognitive maps), appraisive aspects (e.g., evaluation of the environment, spatial preference), and developmental aspects (e.g., children's perception of the environment). It is shown that the major topics of this subject in Anglophone countries have also been discussed by Japanese geographers. Recently, however, non-behavioral approaches to environmental perception, such as humanistic or socio-cultural, have been increasing.

Key words: behavioral geography, environmental perception, mental maps

Introduction

Behavioral research in geography, called behavioral geography, emerged in Anglo-America in the 1960s and has been accepted into many countries. Although several unique trends in this subfield of geography can be identified in non-Anglophone countries (Bailly and Greer-Wootten 1983; Gold 1984), Japanese behavioral geography has been much influenced by the studies in Anglophone countries.

Whereas Saarinen et al.'s (1982) international inventory of environmental perception research listed 30 examples of Japanese literature, they are limited to the ones published before 1980. Over the past few decades, Japanese geographers have devoted much attention to this subject. Most foreign geographers, however, appear to know little about the development of Japanese research in this field, especially since the 1980s. The aim of this paper is to redress such an imbalance in the flow of academic information by introducing the trend in the studies in Japan to foreign researchers. While there are several different approaches to environmental perception, this paper focuses on positivistic research based on the behavioral approach (Golledge and Stimson 1987), leaving out humanistic or socio-cultural research.

In the subsequent section, the process of development of Japanese behavioral geography is briefly outlined to clarify the situation in this field. Then, the empirical studies on environmental perception in Japan are reviewed dividing the subject into designative aspects concerned with “whatness” and “whereness” of the image, appraisive aspects incorporating evaluation and preference (Pocock and Hudson, 1978), and developmental aspects focusing on children’s perception of the environment.

Development of Behavioral Geography in Japan

Behavioral geography was originally introduced into Japan as a subfield of quantitative geography or what is called “new geography” in the 1970s. For example, Ishimizu (1976) mentioned the research on spatial behavior as a subfield of quantitative geography, introducing the research on mental maps, residential movement, consumer behavior, and time geography. Kohsaka (1975) also suggested the shift in the...
research frontier of quantitative geography from spatial pattern to spatial process, including behavioral research. From a somewhat different viewpoint, Nakamura et al. (1976) emphasized the importance of behavioral research for scientific explanation in geography.

Owing to the increase in the number of studies concerning behavioral geography, a section on perception and behavior has been added to Geographical Bibliography edited by the Human Geographical Society of Japan (HGSJ) and the annual reviews in Human Geography (Jimbun-Chiri) since the 1980s. This indicates that behavioral geography has acquired academic citizenship in Japan. In addition, Chiri, a popular journal that aims at transmitting geographical research to a wide Japanese audience, put together special issues on mental maps (November 1980) and time geography (December 1989); Japanese translations of important literature on behavioral geography (e.g., Downs and Stea 1973; Gould and White 1974; Cox and Golledge 1981) were also published. As a result of these propagations, many textbooks of human geography incorporated sections concerning behavioral geography and, recently, introductory textbooks of behavioral geography were published (e.g., Sugiura 1989; Nakamura and Okamoto 1993).

The above-mentioned facts are reflected in Figure 1 that shows the increase in the number of articles listed in the section of environmental perception in the bibliography of geography (HGSJ 1984, 1989, 1993). Naturally, this section included not only behavioral studies but also humanistic ones and ones by non-geographers. At any rate, Figure 1 illustrates how perception and behavior have attracted Japanese geographers over the last two decades. The number of articles, however, has declined since 1986. In addition, the number of researchers specializing in behavioral geography remained less than 20 according to Directory of the Association of Japanese Geographers (AJG), 1995.

Three reasons for the recent decline of Japanese behavioral geography can be pointed out. First, the lack of cross-disciplinary interaction with behavioral sciences has kept Japanese geographers away from the behavioral approach: the majority of Japanese human geographers have traditionally been committed to social or historical sciences. Secondly, the absence of research groups concerning behavioral geography within AJG caused a difficulty in active collaboration of researchers and sharing of methodology or concepts. This also entailed the loss of identity of behavioral geographers and diversification of their research interests. Thirdly, the criticism on behavioral geography from Marxists and humanists at the beginning of the 1980s (Wakabayashi 1985) turned geographers’ attention to non-behavioral approaches. Such a condition of this research field is similar to Great Britain (Gold 1984, 1992) rather than North America (Saarinen et al. 1984; Aitken et al. 1989).

Designative Aspects of Environmental Perception

The method for drawing out the image of the city developed by Lynch (1960) has been applied in Japanese cities (e.g., Takatsu 1975; Terasaka 1986). Although these studies described distinctive characteristics of the public image of the city, the results hardly provided a systematic understanding of the nature of environmental perception. Until now, systematic research into the designative aspect of environmental perception has been carried out by focusing on the information field (Potter 1979), the cognitive distance/direction, and the cognitive map.

Information field in geographic space

The earliest studies of environmental perception were primarily concerned with the extent
of mental maps, viz. information field, in geographic space. Nakamura tackled this subject by analyzing the data regarding the cognition of bus stops by high school students in Nagoya City (Nakamura 1977). The result of the analysis supported the hypothesis of the wedge-shaped mental map (Adams 1969). He also represented a configuration of bus stops on "mental space" by employing Hayashi's (1952) suryoka 3 rui, a method for the quantification of qualitative data. Further investigation was conducted by Wakabayashi (1982) who applied the suryoka 3 rui to the data concerning the cognition and usage of supermarkets by consumers in Saga City. He showed that the spatial structure of the city affects the usage field more than the information field.

The extent of the mental map is, however, not continuous in geographic space. Gonda (1979) examined the place name readability of junior high school students in Tokyo, detecting a discontinuity in the information field between Yamanote upland and Shitamachi lowland. Okamoto (1981) also analyzed place name cognition of junior high school students in Takefu City. He found that the information field was defined by the boundary of the school zone as well as the distance from home. Such an effect of the school zone on the information field of children was also shown by Iwamoto (1981).

Naturally the information field differs among individuals. Nakamura analyzed the factors affecting such a difference in peoples' cognition of urban facilities in Nagoya City by employing the design of experiment (Nakamura 1980). The research revealed that the residential location much affected the pattern of cognition of the facilities.

While the majority of the studies on environmental perception have centered on urban environment, several studies were carried out in a non-urban context. Hamatani (1983a) examined the territorial perception of rural communities throughout Japan except Hokkaido and Okinawa, using the data from the Rural Settlement Survey undertaken by the Ministry of Agriculture and Forestry in 1970. He noted that oaza boundaries originating in the feudal era and the degree of urbanization influenced the perceptual territory of rural communities. A similar result was obtained by Sekido (1987) who analyzed both the data from questionnaires collected in a suburban district of Nagoya City and the same data as Hamatani (1983a) used. In a suburban district of Yama-gata City, Hamatani (1982) investigated perceptual discrimination between rural communities. He showed that villagers better discriminated the communities near their residence than remote ones; degree of discrimination increased with the length of residence.

On a neighborhood scale, Onjo (1988) demonstrated that the extent of the neighborhood perceived by residents in a suburban housing complex in Yokohama varied with social network, daily behavior, and sex. In a more urbanized area, Hara (1994) analyzed the relationship between the social space and the social network of residents. He showed that the extent of the social space expanded with participation in community organizations.

Cognitive distance and direction

The pioneering work on environmental perception in Japan was carried out by Takahashi (1972) who analyzed cognitive distance and direction within downtown Tokyo. He asked students to estimate distance and direction from a reference point. The result of the analysis revealed that the distances to remote places tended to be underestimated and the relative directions were correctly estimated in spite of the marked errors in absolute directions.

Tanaka and Wakabayashi (1985) further investigated the properties of cognitive distance and direction in Hiroshima City. The cognitive distances were overestimated with the increase in the number of bridges intervening between the origin and the end point; the cognitive directions systematically deviated from the actual ones adjusting the reference lines of the city, namely the river channels, to cardinal directions.

A close examination of the factors affecting the cognitive distance was attempted by Okamoto (1983). He analyzed the cognitive distance of high school students in Nagoya City. The result of the analysis showed that stimulus-centered factors, namely the properties of origin and destination and the types of dis-
tance, had a greater influence on cognitive distance rather than subject-centered factors. In addition, the subjects showed a tendency to underestimate distance toward the city center compared with distance away from it, which corresponds to the facts obtained in European cities (e.g., Lee 1970).

Cognitive map

Wakabayashi (1989; 1990a) attempted a close examination of the result obtained by Canter and Tagg (1975) using the methods of Procrustes rotation and spatial statistics. He compared two methodologies, namely sketch mapping and distance estimation, for extracting the cognitive map of the major railroad stations in Tokyo for university students. The cognitive maps obtained by these methods commonly showed a transformation of the loop line to a well-balanced form in a similar manner to the result of Canter and Tagg (1975).

These studies implied the relationship between the distortions in cognitive maps and the spatial structure of the city. This relationship was examined by Wakabayashi (1990b) who measured the cognitive map of the central part of Sapporo City covered with a grid-patterned street system. The cognitive map obtained by distance estimation was better represented in city-block metric than in Euclidean space.

A detailed investigation of the distortions in cognitive maps was undertaken by Wakabayashi and Itoh (1994) who analyzed the cognitive map of Kanazawa City. They divided the distortions into absolute, systematic, and relative elements using Euclidean regression. The result of the analysis revealed that the influence of the spatial structure of the city was markedly reflected in the absolute distortions. Wakabayashi (1994) compiled the above-mentioned studies on the basis of an integrated framework of the information-processing model.

While these studies left out the difference of cognitive maps among individuals, Yano (1990) examined the factors affecting the variation of cognitive maps. He analyzed the cognitive maps of university students in Niigata City using INDSCAL. The result of the analysis showed that the variation of cognitive maps was influenced by location of residence, means of transportation, and frequency of visit to places.

Appraisive Aspects of Environmental Perception

Evaluation of the environment

A variety of analyses have attempted to capture the spatial patterns and the multidimensional nature of environmental evaluation. In this section, their findings are summarized by classifying them into several topics.

Images of the urban districts

Tomita and Kinoshita (1982) examined the relationship between the images of the urban districts within Yokohama City and the amount of experience by means of the Semantic Differential (SD) and the free recall test. The recalled words associated with place names indicated that experienced people can evoke a concrete image of the city. The images drawn from the SD method varied with the location of residence and the frequency of visit.

Such an areal difference in the image of the urban environment was shown by Wakabayashi (1988) who attempted a multidimensional analysis of the consumers' image of retail facilities in Kofu City. While the consumers shared a common image structure composed of price level, distance from home, and store size, their relative importance varied with residential location. The image structure of retail facilities differed with residential location as well as with the type of goods. Hashi (1989) also detected different structures of store images for two types of goods using the SD method in Kanazawa City.

The SD method was also applied to a comparison of image structure between urban and rural inhabitants by Kumai and Takano (1989). They asked respondents from urban and countryside areas to evaluate various types of photographs using the SD method. The result of the analysis showed that rural inhabitants have an ambivalent sense of the urbanized landscape while both urban and rural inhabitants share a common structure of landscape evaluation.

From a different viewpoint, Bito (1991, 1992) attempted a regionalization in terms of local image. He regionalized Tokyo and its sur-
rounds by relating the characteristic features of local images to objective indicators. As a result, eight types of region arranged in concentric and sectorial pattern were identified.

**Evaluation of the living environment** Ishimizu (1980) examined the relationships between the residents' perception of the living environment and the motivation for residential movement in Shizuoka City. He concluded that people's intention of settling permanently at their present residence varied with age, length of residence, and home ownership.

Esaki (1995) undertook a detailed investigation of the residents' evaluation of their living environment focusing on the stability of value-orientation among districts. He analyzed the data concerning satisfaction and significance ratings for 14 variables obtained through the questionnaire from two housing estates within Yokohama City. The result of the analysis indicated that the patterns of the significance ratings were stable among two districts while those of satisfaction ratings varied between the districts.

Recently GIS has been applied to evaluate the living environment. For example, Sekine (1994) analyzed the spatial variation in the level of residents' satisfaction with the living environment and its relationship with objective indicators in Morioka City using GIS. She showed that the level of satisfaction was related to the number and size of facilities within the range of 500 meters from the home.

**Images of the cities** Uchida (1986) examined the perceptual evaluation of Japanese cities in terms of fukaku, that is to say, dignity or character in English. He asked Japanese geographers to evaluate 70 cities in terms of fukaku and to enumerate symbolic elements of the cities. The result of the analysis indicated that the evaluation of fukaku consists of two dimensions, viz., the aesthetic dimension represented by historic aspect and the dimension of capacity represented by economic function and size.

Such a multidimensional nature of the image of the cities was also examined by Itoh (1994), who asked university students to evaluate the cities in the Hokuriku Region using the SD method. He extracted three dimensions of the image by means of the factor analysis: yearning, separation, and uncertainty for the cities. He also showed that each of these dimensions correlated with objective indicators of the cities.

**Evaluation of tourist or recreation sites** An attempt to develop an objective and simple method for the evaluation of tourist resources was made by Mizoo et al. (1975). They asked five specialists to evaluate 392 tourist resources of Japan in terms of 14 variables. The five variables summarized by the factor analysis were correlated with the overall evaluation of the resources. The result of the analysis indicated that the overall evaluation was affected by size, composition, and locality of the resources.

Mizoo and Osumi (1983) further investigated the evaluation of Japanese lakes in a similar manner. The overall evaluations of 35 lakes made by 15 specialists significantly correlated with transparency, surrounding scenery, and accessibility. The above-mentioned studies were summarized by Mizoo (1987).

On the other hand, Sugiura and Kato (1992) explored the major dimensions of peoples' image of city parks, using the SD method. They asked the visitors to five parks in and around Tokyo to evaluate each park in terms of 38 variables. The result of the analysis indicated that people evaluate the city parks along three basic dimensions: tranquility, outer appearance, and natural or artificial environmental beauty.

**Perception of natural hazards** The methods for studying perception of natural hazard developed by the Chicago school (e.g., Kates 1962) has been applied to hazard events in Japan by K. Ando. Ando (1982) examined the relationship between people's perception and adjustment to flood hazard in waju, the settlement and fields surrounded by ring levees in Gifu Prefecture. He measured the image of the flood hazard using the SD method. Four basic dimensions of the image were identified by the factor analysis: seriousness, controllability, appearance, and expectancy. The analysis of the relationship between the image and adjustment behavior proved that people perceiving the flood hazard as serious and destructive were inclined to make many adjustments.
Subsequent to this, Ando (1989) examined the relationship between farmers' perception and adjustment to the cool summer hazard damaging rice production in Aomori Prefecture. He identified four basic dimensions concerning the image of the hazard similar to the ones obtained by Ando (1982). The relationship between the image and the adjustment to the hazard showed that farmers taking a pessimistic view of their fate actively adjusted to the hazard.

The same subject was also treated by Ando (1983) and Ando et al. (1984). They compared the farmers' perception and adjustment to the cold weather in two villages differing as to the amount of damage in Aomori Prefecture. The result of the analysis proved that the farmers who suffered from serious damage tended to be sensitive to weather and active in adjustments.

Spatial preference

Nakamura applied the method for analyzing the spatial preference developed by P. Gould (Gould and White 1974) to Japanese students (Nakamura 1979). He elicited residential desirability of each prefecture from high school students residing in six areas of Japan. The resultant surfaces of the residential preference were composed of the general surface common to all groups of the subjects and the local domes specific to regional groups. The local dome indicated that each of the regional groups preferred the prefectures near their residence. Regarding the general surface, the prefectures known for sightseeing or located in warm and urbanized area, with the exception of Tokyo, were commonly preferred. He also pointed out the relatively low homogeneity as a notable feature of the preference surface in Japan.

A further investigation of the spatial preference was undertaken by Aniya (1980) who analyzed residential preference and avoidance as well as work preference of high school students in Iwate Prefecture. He found that the students most preferred Tokyo as workplace while most of them avoided residing in Tokyo. In this way, rural inhabitants have an ambivalent feeling for Tokyo.

The local pattern of the preference surface exhibits a tendency different from the one at the national scale. For example, Fujime (1993) asked the staff of public offices to score each municipality within Ehime Prefecture in terms of residential desirability. The preference surface indicated that people preferred the cities near to their residence and the prefectural capital. He also tried to relate the pattern of preference to the QOL indicators.

The preference surface within a city region was examined by Hamatani (1983b). He analyzed the spatial pattern of the residential desirability in a suburban area of Yamagata City. The preference surface declined steadily with increasing distance from the city center except for local domes around home districts. These local domes for the newcomers were lower than those for the long-term residents.

From a different viewpoint, Sugiura et al. (1993) examined the patterns of preference for the city parks in Tokyo applying MDPREF, a non-metric MDS algorithm. They showed that the parks covered with green and/or those with an open atmosphere were preferred; the more artificial parks were less preferred.

Developmental Aspects of the Environmental Perception

While a large number of studies have been made on the developmental aspects of the environmental perception by psychologists, Japanese geographers have also paid attention to this subject from an educational viewpoint. The context of geographical studies on this subject can be classified into the following two types according to the spatial scale and the mode of experience: the perception of the neighborhood or community shaped chiefly by direct experience, and the perception of the country or the world affected by indirect experience. The former studies have mainly focused on elementary schoolchildren while the latter ones have concerned both pupils and students.

Children's perception of the neighborhood and the community

Though Japanese geographers have paid attention to the patterns and the development of the children's sketch maps since the 1960s, the examination of their relationship with the geo-
Graphic environment was started by Saito (1978). He analyzed the spatial extent of the children's imaginary environment in a mountainous village. Evidence indicated that the four ranges of their imaginary environment were structured as a concentric circle and were pierced by a "lead line" (e.g., main road, railway). This finding was confirmed by Iwamoto's (1981) study conducted in Tokyo.

While these studies were concerned with the perception by children of the same age, Iwamoto (1989) attempted a comparison of the sketch maps of the familiar environment drawn by children in different grades at an elementary school in Tokyo. He noted that most of the children in the lower grade tended to draw route maps connecting home to school; the children in the upper grade easily drew survey maps of wider area. A further investigation was undertaken by Teramoto (1984a) who asked 1,432 pupils of elementary and junior high schools inside the Aso caldera to draw sketch maps of their familiar environment. He observed a remarkable change in the perceived environment between the third and the fifth grade at the elementary school. He also pointed out the importance of the "lead line," viz., psychological flow line, in such a development. This rapid growth of perceptual space in the intermediate grade of elementary school can be related to the expansion of children's playing space and map education in school (Teramoto and Ooi 1987).

In contrast to these findings, Izumi (1993, 1994) argued that the pupil's environmental perception does not necessarily develop with the advance in grade. He analyzed both pupils' sketch maps and their daily activities in Hiroshima and Tsuchiura Cities. On the basis of the analysis, he pointed out that the current conditions surrounding Japanese children, such as cram outside school hours, club activities in school curriculum, and indoor play, prevented the children from expanding their action and/or activity space.

Naturally, the children's environmental perception can also be influenced by the regional setting. For example, Teramoto (1984b) indicated that the patterns of the children's sketch maps varied with size or configuration of the school zone, and the pattern of road network. Teramoto et al. (1991) also compared the characteristics of children's sketch maps among urban, rural and mountainous areas. In urban areas, the perceived space was influenced by the cognition of street systems while the range of perceived space in urban areas tended to be narrower than in rural areas; the perceived space of mountain dwellers was strongly restricted by landform.

A further investigation of the regional difference in children's environmental perception has been undertaken by Yamano (1985) and Teramoto and Yoshimatsu (1988) from a cross-cultural viewpoint. They conducted comparative studies of sketch maps drawn by children in mountainous areas in Japan, Sri Lanka, and Thailand. The results of the analyses indicated that Japanese children tended to draw abstract maps with more signs and symbols than those of the other countries while the younger children in these countries commonly drew realistic and concrete maps with emotional expressions. Such a difference between the countries can be due to the availability of maps as well as the training in map use in primary education. On the other hand, they also called attention to the danger that Japanese children may lose physiognomic perception at an early stage of development.

Children's perception of their home country and the world

Since people cannot directly perceive the large scale environment, such as the country or the world, they usually acquire knowledge about the environment through indirect experience, i.e., mass media and school education. Japanese geographers have studied children's perception of the country and the world in connection with primary and secondary education since the 1960s.

Perception of the country A considerable number of studies have been done on children's perception of place names within the country. These studies commonly showed that the number of place names recognized by pupils markedly increased in the intermediate grade of elementary school and displayed a distance decay tendency. Specifically, accuracy of the
locational cognition of the Japanese prefectures has received geographers’ attention (e.g., Yamaguchi and Takahashi 1987; Tanaka and Sugiyama 1989; Miyahara 1995). These studies indicated that the children could accurately perceive the prefectures that are located at the edge of the country and have wide areas or unique shapes. On the other hand, it was hard for them to distinguish the inland prefectures; the prefectures with similar names or shapes were likely to be confused.

A few studies have been made on the emotional aspects of the children’s perception of the country. For example, Kobayashi (1985) reported that pupils expanded their interest in areas with the advance in grade. Naturally such an expansion of pupils’ interest was influenced by both mass media and school education. Yamaguchi (1994) examined these influences on the establishment of the pupils’ regional image. As shown by the study on the residential preference by Nakamura (1979), high school students in Japan tended to prefer Hokkaido and Okinawa but to avoid the Tohoku and Shikoku districts. Yamaguchi (1994) found that this pattern of preference was applicable to all pupils and was established in the upper grade of elementary school, which can be attributed to the effect of mass media and school education.

Perception of the world Children’s perception of the world can be especially influenced by indirect experience, namely mass media. For example, Kikuchi (1965) indicated that the number of foreign countries known by Japanese pupils markedly increased after the Olympics at Tokyo in 1964 because mass media widely reported the games, turning Japanese people’s attention to the world. The Japanese children’s image of the world can be much influenced by the global maps and atlases used in the classroom, especially those of Mercator’s projection (Sarutani 1976) and those centered on Japan. Kambe (1984) illustrated this with the fact that the pupils overestimated the size of Europe but underestimated the size of Africa. Concerning the appraisive aspect of the image, Yamaguchi (1994) pointed out that Japanese pupils’ preference for Western countries tended to be established in the upper grade of elementary school.

Concluding Remarks

As shown in the previous chapters, Japanese geographers have shared a common interest in the environmental perception with geographers in Anglophone countries; the validity of the theories and methods developed in these countries has been confirmed by the studies in Japan. However, the behavioral approach to this subject inevitably entailed the problems common to quantitative geography because behavioral geography has originally tied up with the “quantitative revolution.” Ishikawa (1993) pointed out four features of Japanese quantitative geography: 1) diversification in terms of methods and topics, 2) excess of import over export of ideas and findings, 3) concentration on empirical analysis, and 4) less social relevance. These can be applicable to behavioral geography.

The first point is illustrated by the fact that only a few subjects shown in this paper have been successively tackled. This may be due to a shortage of the number of researchers specializing in this field: the majority of the studies cited above have been conducted by researchers specializing in other subfields of geography (e.g., quantitative geography, urban/rural geography).

The second point can be attributed to the language barrier and may be applicable to the other fields of Japanese geography. A major aim of this paper is to redress such an imbalance of the international flow of information.

The third point is exemplified by the fact that most of the studies shown in the previous sections were not based on design of experiment. In contrast to geographers, Japanese psychologists have attempted an experimental approach to environmental perception. Though these difference might be due to the division of labor among disciplines, geographers ought to verify the findings by some experimental method or theoretical reasoning. One reason for the lack of methodological or theoretical development in Japan may be that the majority of the studies in this field adopted the behavioral approach as a supplement to the existing ones. As a result,
theories and methods were entirely borrowed from other disciplines or imported from foreign countries.

The last point is illustrated by the fact that Japanese geographers have given little attention to policy-making or planning. An exception to this point is Mizoo and his coworkers' studies on the evaluation of tourist resources (Mizoo et al. 1975; Mizoo and Osumi 1983). In addition, the inquiries into the children's environmental perception can be applicable to geographic education. As mentioned in the previous chapter, numerous attempts have been made on the developmental aspects of environmental perception from an educational viewpoint, which reflected the fact that one third of the members of the Association of Japanese Geographers are engaged in elementary or secondary education.

In comparison with Anglophone countries, relatively few studies have been made on the microgenetic process of environmental learning and the decision-making process of spatial behavior in Japan. While Japanese geographers have directed their attention to the ontogenesis of environmental perception from an educational viewpoint, they have rarely investigated its microgenetic aspect, viz. the relationship between environmental learning and experience. Concerning the decision-making process, few attempts have been made at connecting environmental perception with spatial behavior (e.g., shopping, migration). As a result, this field of research has become alienated from the studies on spatial behavior.

In recent years, Japanese studies on environmental perception have been more affected by humanistic or socio-cultural approaches rather than behavioral ones. These studies have usually taken an interpretative methodology that extract people's environmental image indirectly from external representations, such as literature (Aoyama 1985; Uchida 1989; Fukuda 1991; Sugiura 1995), pictorial maps (Katsuragawa Ezu Kenkyukai 1988, 1989), vernacular place names (Nakashima 1986; Sekido 1989, 1994; Furuta 1987; Fukuda 1989; Nakamura 1995), magazines (Naruse 1993) and popular songs (Mizoo 1991), rather than directly from respondents through experiments or questionnaires. In order to revitalize this subfield of geography, as Gold (1992) said, the behavioral perspective of environmental perception ought to be realigned with the socio-cultural or humanistic approaches.

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