

THE EFFECT OF A PHYSIO-POLITICAL BARRIER UPON URBAN ACTIVITY SPACE¹

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Abstract. This research examines what effect a physical and political barrier, the Ohio River and the Ohio-Kentucky state boundary, have upon the urban activity space of a sample population. Activity space is defined as the geographical domain in which a specified set of activities takes place, *i.e.*, specified social, economic, and service activities. The sample was selected from households in Newport, Kentucky, a community separated from the Central Business District of Cincinnati, Ohio by the barriers. Data was collected by questionnaire. Results analyzed graphically and by correlation coefficients showed that these barriers are highly influential upon the behavior of the sample. The influence of the barriers upon spatial behavior, however, does vary depending on the particular activity.

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The effect of a physical and political barrier upon spatial interaction is the focus of this research. Specifically, this study examines the effect of a barrier upon the activity space of a group of urban residents. Their activity space is composed of the geographical domain in which a specified set of activities takes place. Included in this study are activities involving social functions such as places visited with friends and relatives and, in addition, religious and recreational activities. Economic activities are also included in this activity space, and they ascertain the place in which individuals shop for specific items such as groceries, household supplies, and clothing. Additionally, the activity space encompasses service activities in which individuals acquire medical, dental, and banking services.

Previous research examining the effect of a political barrier upon spatial interaction found that "personal action spaces may well be skewed in directions along or away from the boundary" (Reynolds and McNulty 1968). More recent geographical research on this subject has demonstrated that residents contending with urban structural barriers such as topographic or transportation elements exhibit directional biases and a greater degree of social interactions with-

in a city. Therefore, the barrier tends to foster social segregation by generating a "greater degree of social interaction with neighbors" (Stutz 1973).

Other research focusing upon barriers has attempted to quantitatively analyze the effect of physical barriers upon interaction. Yuill's analysis (1974) proceeded in this direction through the process of simulation and the effect of a physical barrier such as a river upon the spatial configuration of city growth. Since the most efficient area for a city is a circle, a river barrier, such as that confronting residents in the areas immediately adjacent to Cincinnati, Ohio and Detroit, Michigan, had caused a marked deviation from the hypothesized circular pattern of city development (Yuill 1974). Another analysis of the barrier effect, using a form of the gravity model, concluded that a political boundary, specifically the United States-Canadian border and the Ontario-Quebec border, had a much greater effect upon interaction than that expected by distance (Mackay 1958). In general, the effect of barriers upon spatial interaction among people is evident. The crucial factor in specific instances is an understanding of the significance of existing barriers on essential and/or preferred activities of urban populations. The purpose of this study, therefore, is to investigate the effect of a

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physio-political barrier upon the spatial interaction of a sample population.

Due to the fact that activity patterns of urban residents have been found to vary according to their geographical location within metropolitan areas, the present research will reduce the effect of this factor by selecting a sample population from a small area. The area is a municipality within the Cincinnati SMSA—Newport, Kentucky. Newport is separated from the CBD of Cincinnati by both a physical and political barrier—the Ohio River and the Ohio-Kentucky state boundary. These barriers are essentially coincident.

METHODS

In order to reduce the probability of bias in the study population, a random sample was taken from the names listed in the 1975 Williams' City Directory. According to the United States Census of Population, 1970, Newport had a total population of 25,998 persons and there were approximately 8,500 households. Newport was chosen as a study area because of its easy accessibility to downtown Cincinnati; therefore, with the two bridges linking Newport with downtown Cincinnati, there is obviously

potential for interaction. In terms of socioeconomic characteristics, Newport is typical of other communities which are within proximity but also in Northern Kentucky such as Bellevue, Dayton, or Covington. Time and financial restraints allowed 1,000 households to be randomly sampled from Newport, representing approximately 12 percent of the total number of households.

The method of data collection was a mailed questionnaire. Experience suggests (Selltitz et al 1976) that a response rate of 10% to 50% is average for mailed questionnaires; in this case the return was 15%, probably resulting from the length of the questionnaire, which solicited 50 different responses. Such a response rate may cause the sample to be somewhat less than representative of the population of the study area. For this reason, the conclusions drawn from the study relate only to the the sample, and no suggestions will be made regarding the study area in general. The initial purpose of the questionnaire was to ascertain where the respondents went for a number of selected and routine activities and to solicit information that may influence the geographical domain of these activities.

Activity space, a composite measure and the focus of this study, serves as the dependent variable. Two major assumptions were made in defining the activity space concept and analyzing the data:

1. The activity space of each respondent is a composite of the distance traveled to a

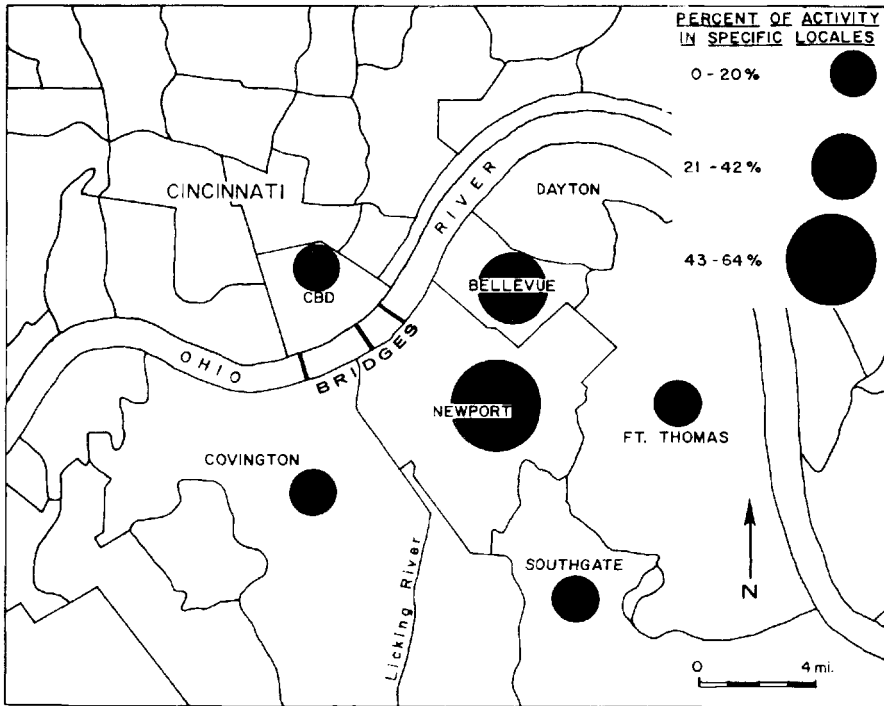


FIGURE 1. Spatial extent of grocery shopping.

maximum of 30 activities. Such space could involve a smaller number of activities if the individual responding to the questionnaire indicated that he/she did not take part in one or more of the 30 activities.

2. Average activity space will be the term utilized to denote the dependent variable. It is computed by taking the total activity space and dividing it by the number of activities in which the respondent participates.

A Cartesian coordinate system was used to determine the distance a respondent traveled for each activity. These distances were the basic data utilized to compute average activity space. From this Cartesian coordinate system, another variable was formulated. This variable was direction and is composed of 4 cardinal directions—north, south, east, and west.

RESULTS AND DISCUSSION

An examination of the spatial interaction of the sample population suggests that the relative dispersion of the activities varied. This variation, however, could be associated with the type of goods and services sought by the sample group. Essentially, most of the low-order goods, such as groceries, gasoline, drugs, hardware items, health services, banking and auto repairs are available in Newport. Therefore, these goods were obtained there, as indicated in figure 1, which shows the spatial distribution of grocery shopping. In contrast, respondents were willing to travel to Cincinnati for higher-order items such as furniture, clothing, and appliances that are not as available in the home community. This tendency is revealed in figures 2 and 3, which show the spatial distribution of furniture and clothing shopping, respectively. It is worth noting that a small number of Newport residents use large regional shopping respectively. These centers are located quite a distance from the home community, Newport, in suburban Cincinnati areas.

The home community was the focus of the majority of social activities. Table 1 indicates that 57% of the respondents socialized with their co-workers in nearby Kentucky communities. With regard to sport activities that would also be considered part of the social activity realm, many of the respondents tended to travel to downtown Cincinnati as shown in figure 4.

TABLE 1
Specific locales for social activities
(% of respondents who travel to each locale).

Place	Visiting Co-Workers (%)	Organization or Club Activities (%)
Newport KY	35	57
Bellevue KY	1	7
Covington KY	12	6
Dayton KY	2	1
Southgate KY	1	4
Ft. Thomas KY	6	8
Cincinnati OH	33	14
Other Kentucky Communities	7	2
Other Ohio Communities	3	1

When the journey to work is considered, a sizeable proportion of the sample population traveled across the barrier as shown in figure 5. This particular tendency has an effect on the location chosen for the social activity of visiting co-workers. Table 1 indicates that over 33% of the study group crossed the barrier for this activity. Also indicated in Table 1 is the fact that the barrier effect varied with activity. This variation is illustrated with organizational and club activities focused in the home community and neighboring Northern Kentucky communities (table 1).

A further examination of the factors influencing the activity space of the sample population was made with simple correlation analysis (table 2). From this analysis, it was found that two of the directions, southwest and northwest, have significant relationships with the dependent variable average activity space. Since the relationship is positive in the direction of the home community and negative in the direction

TABLE 2
Simple correlation coefficients.

	Direction			
	NE	SE	SW	NW
Average Activity Space	-.07	-.14	.36*	-.30*

*Significant relationship at .05 level.

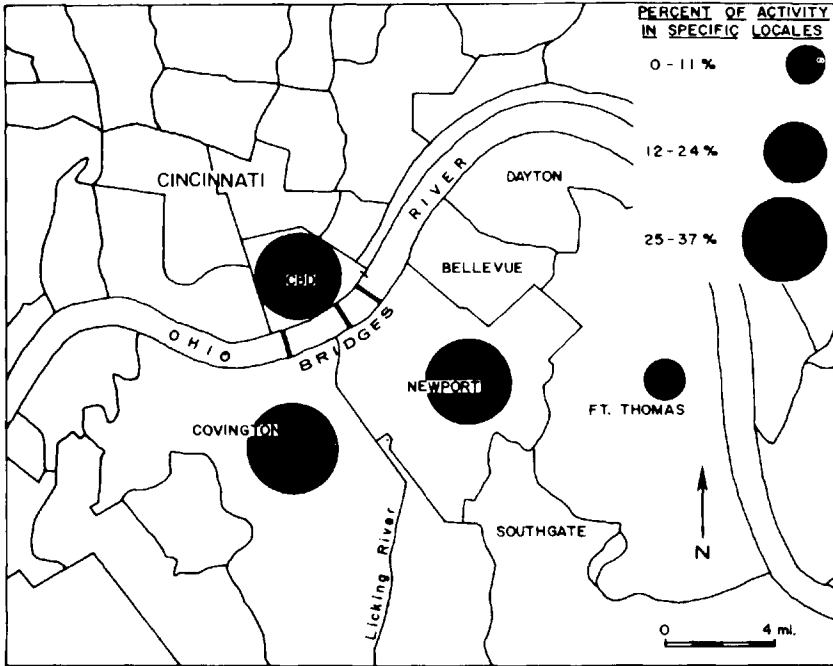


FIGURE 2. Spatial extent of furniture shopping.

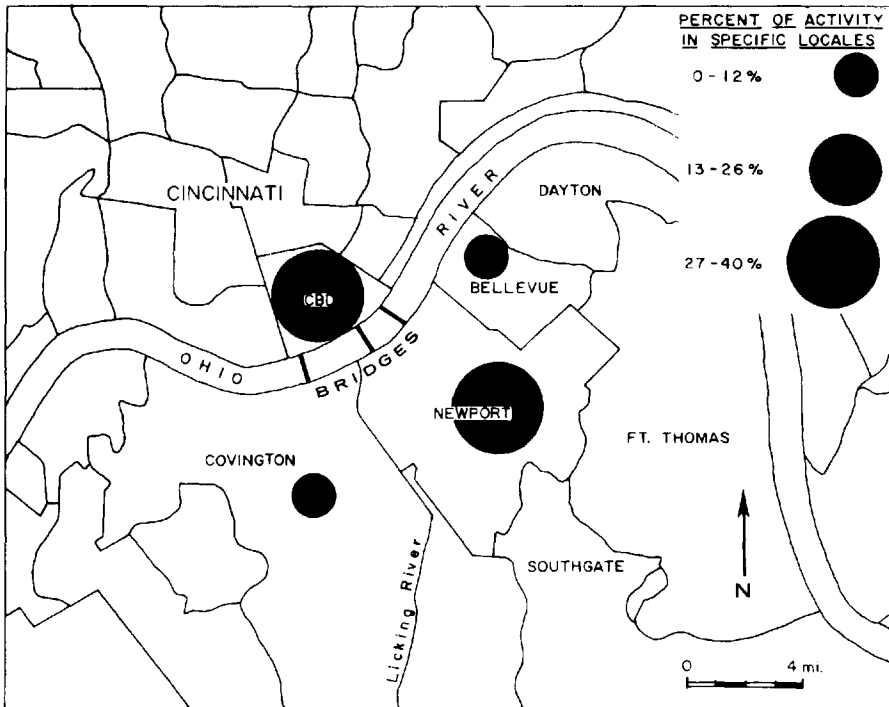


FIGURE 3. Spatial extent of clothing shopping.

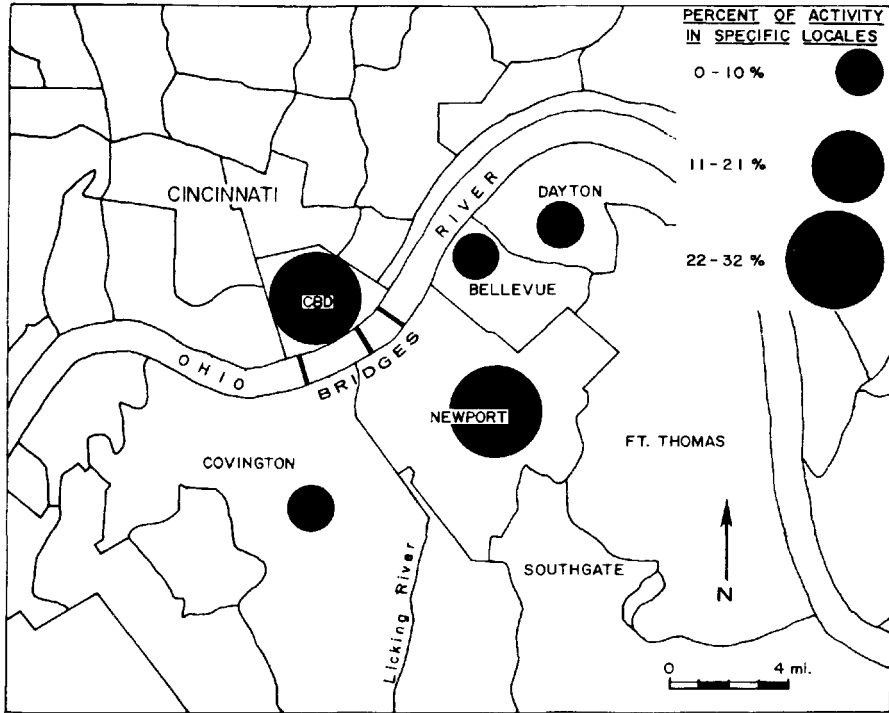


FIGURE 4. Spatial extent of sport activities.

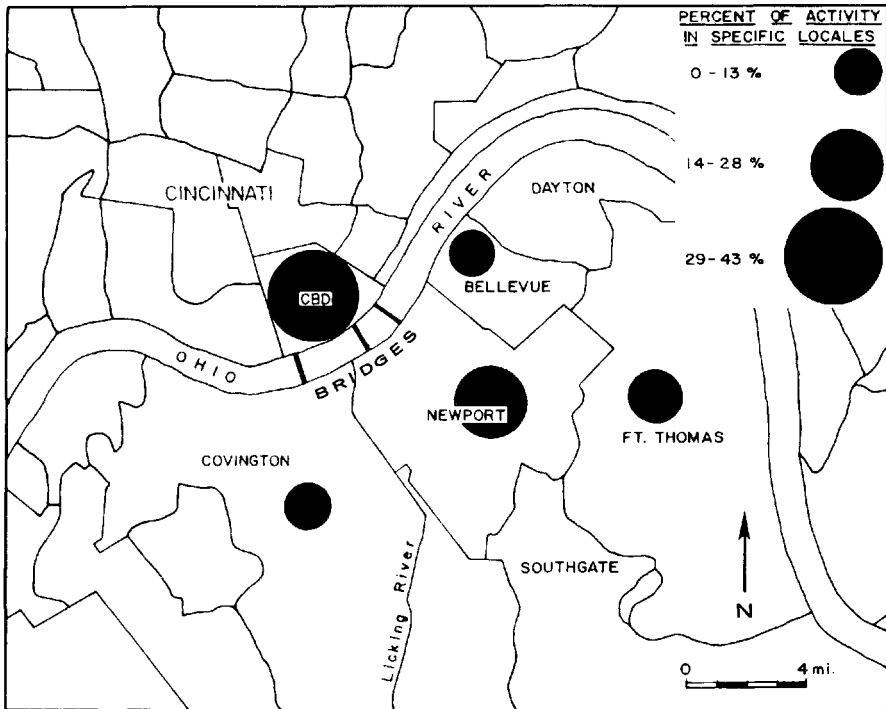


FIGURE 5. Spatial extent of journey to work.

away from the home community, these findings validate previous research of Yuill, Stutz, Reynolds and McNulty that barriers do have an effect upon spatial interaction. Additionally, the results indicate that the barrier is more important in some activities than in others. The importance of the barrier seems to be very closely associated with the hierarchy of goods, meaning that respondents were willing to cross the barrier in order to obtain higher-order goods or services, but less likely to cross the barrier for lower-order ones.

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