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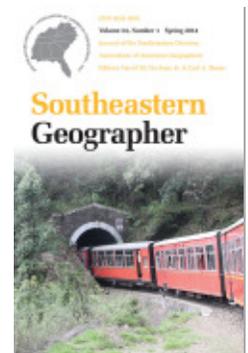
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## Appalachia: A Comparison of the Cognitive and Appalachian Regional Commission Regions

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Southeastern Geographer, Volume 21, Number 1, May 1981, pp. 40-53  
(Article)

Published by The University of North Carolina Press  
DOI: 10.1353/sgo.1981.0003



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## APPALACHIA: A COMPARISON OF THE COGNITIVE AND APPALACHIAN REGIONAL COMMISSION REGIONS\*

*Richard Ulack and Karl Raitz*

A basic analytical tool in geography is the region, and defining appropriate regional boundaries is a useful but often difficult task. In the United States some regions, such as the Midwest, are amorphous and difficult to delimit. Others, such as Appalachia, are quite vivid and have been much studied yet lack definitive boundaries. This paper compares two types of regionalizations as they apply to Appalachia and addresses two questions: 1) how is the Appalachian region delimited by students who attend colleges and universities in or near the region and 2) to what degree do these cognitive regions agree with the region as defined by the Appalachian Regional Commission (ARC)? The ARC regionalization is the most recent and widely known of the various efforts to delimit Appalachia, and a comparison of the cognitive maps of residents from Appalachia and nearby with the ARC region seems appropriate.

*DEFINING THE APPALACHIAN REGION.* The number of attempts to objectively define the Appalachian region—and each attempt has been based upon somewhat different criteria—has prompted Whisnant to observe that “Appalachia’s boundaries have been drawn so many times by so many different hands that it is futile to look for a correct definition of the region.” (1) One of the first to draw a boundary based upon physiography was Nevin Fenneman. (2) This region included the area from northern Alabama to Newfoundland, but geographers have often abbreviated it to include only that portion south of the Hudson and Mohawk valleys in New York. Fenneman’s region includes all or parts of the Appalachian Plateaus, the Ridge and Valley, the Blue Ridge, and the

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\* The authors wish to thank all of the college faculty members and students who participated in the study. They also acknowledge the support of the University of Kentucky Research Foundation and of Robert Cromley of the Department of Geography, University of Kentucky, who wrote the program that enabled us to produce the maps accompanying this study.

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Piedmont physiographic subprovinces. A subsequent delimitation of the region was made by John C. Campbell in *The Southern Highlander and His Homeland*. (3) Campbell's region corresponded in large part with the boundaries of the physiographic divisions and included 256 counties in nine states. He chose to exclude Appalachia north of the Maryland-Pennsylvania border (Mason-Dixon Line), apparently because he believed that the relationship between the southern highland people and their environmental situation was critical to understanding their way of life, a relationship that did not necessarily obtain in the northern Appalachian states. Another regionalization, also limited to the southern and central portions of Appalachia, is found in *The Southern Appalachian Region: A Survey*, edited by sociologist Thomas Ford. (4) This region was based on state economic areas, a concept first used in the 1950 Census to group counties with similar social and economic characteristics. By including counties with low socioeconomic indicators, Ford defined a region that comprised 19 state economic areas, eight metropolitan areas, and included 190 counties in seven southern states.

A fourth regionalization was established by the ARC in the mid-1960s and includes 397 counties in an area that extends from northeast Mississippi to southern New York. The boundaries of the ARC region were based on both physiographic and socioeconomic characteristics. Those counties included in the region were generally in rugged terrain and had populations characterized by low income, high unemployment, low educational levels, and slow population growth rates. Recognizing the substantial variation within this extensive area, the Commission has established three subregions: Northern, Central, and Southern Appalachia (Fig. 1). A major purpose for the establishment of the ARC and the subsequent delimitation of its region, was to facilitate socioeconomic development. Whether or not effective socioeconomic development can be accomplished within the ARC boundaries is, of course, open to debate. Here Whisnant conjectured that the ". . . A.R.C.—Appalachia is too large and too heterogeneous physically, economically, and politically to be dealt with effectively, even if sufficient money were available." (5) Watts has also examined the validity of the ARC region. (6) From a discriminant analysis of the same criteria as that used by the ARC to define its region, she observed that the original region was well-conceived. She concluded, however, that "subsequent additions . . . which were made for political purposes, resulted in a loss of both physical and



Fig. 1. \* Appalachian Regional Commission boundary and participating colleges and universities.

socio-economic uniformity . . . .” (7) Those later “political” additions included 14 counties in New York state and 20 counties in northeastern Mississippi.

*DATA SOURCE AND ANALYSIS.* Few cognitive maps of Appalachia are available for comparison with the ARC region. One is provided by Cox and Zannaras who developed a technique that would project designative perceptions of states from a ranking of state similarities provided by a student sample. A factor analysis of the data revealed an “Appalachian Factor” with high loadings for West Virginia, Kentucky, Tennessee, and Virginia. These results were interpolated into locational classes on an outline map of the United States. (8) In a comprehensive search for America’s vernacular regions, Ruth Hale found limited recognition of the term Appalachia among her respondents. In only two southeastern Ohio counties did a sufficient proportion of her sample

state that the name of the region they lived in was Appalachia, thereby allowing her to map those counties as Appalachian. (9)

To establish the "cognitive Appalachian region," information was gathered from questionnaires distributed to students in 85 colleges and universities both in and adjacent to Appalachia (Fig. 1). The use of college students in cognitive and perceptual studies has considerable precedent. (10) They were chosen as the study population because of their accessibility, high response rate, and higher educational attainment. Such characteristics aid considerably in meeting time and financial constraints. Sixty-three institutions responded, with an average of 39 questionnaires returned from each participating school for a total of 2,485 responses. Students responded to several written questions. They were also provided an outline map of all states east of the Great Plains and asked to draw a boundary around the area they considered to be in Appalachia. We elected to use the completion map technique rather than a free-recall sketch map test. In the latter, the respondent is given a blank sheet of paper and asked to draw the place in question. We chose the completion map technique because we wanted to minimize any distortions in the cognitive maps that might have resulted from differentials in graphic ability or experience, and we wished to compare, as objectively as possible, the cognitive maps of a number of subgroups within the large sample. (11) After all responses and maps were coded and keypunched, a computer program was written that produced maps based on any combination of variables. (12)

The next sections will examine the map of the Appalachian region as perceived by the total group of respondents ( $N = 2,397$ ; 88 respondents did not provide maps). The question of agreement between cognitive maps and the ARC region will then be addressed through analysis of maps that compare the ARC boundary with perceptions of the aggregate group and the following disaggregated subgroups: 1) a subgroup whose county of residence was within Appalachia; 2) those respondents whose county of residence was outside Appalachia but within a state that lies, at least in part, within Appalachia; 3) respondents from states east of the Mississippi River where no part of the state is in Appalachia; and 4) respondents from other states (Table 1). (13)

*APPALACHIA AS PERCEIVED BY COLLEGE STUDENTS.* When the individual cognitive Appalachian maps of all respondents were combined, a composite map with several distinguishing features emerged (Fig. 2). The overall regional pattern has a linear orientation along a

TABLE 1  
STATE OF RESIDENCE OF RESPONDENTS AND LOCATION WITH  
RESPECT TO APPALACHIA

State	Reside in Region		Reside out of Region	
	Number	Percent	Number	Percent
Alabama	30	3.4	26	1.6
Georgia	84	9.6	36	2.2
Kentucky	61	7.0	142	8.8
Maryland	14	1.6	113	7.0
New Jersey	0	0	168	10.4
New York	70	8.0	251	15.6
North Carolina	137	15.6	45	2.8
Ohio	57	6.5	133	8.3
Pennsylvania	146	16.6	181	11.3
South Carolina	34	3.9	36	2.2
Tennessee	54	6.2	97	6.0
Virginia	38	4.3	99	6.2
West Virginia	152	17.3	0	0
Subtotal	877	100.0	1,327	82.4
Other state east of Mississippi River	—	—	157	9.8
Other state	—	—	60	3.7
Other (foreign, unknown)	—	—	64	4.0
Total	877	100.0	1,608	100.0

northeast-southwest axis. We have arbitrarily selected the 10 percent cognitive agreement line as the minimum threshold for establishing a regional boundary. This means that the cognitive region encompasses all or part of 12 states and is just over 1,000 miles long and about 375 miles wide at mid-point. (14) Within the 10 percent threshold line, however, perceived Appalachia shrinks dramatically. The northern third seems the least tenable in the minds of the respondents. Less than 20 percent believe that any part of New York state lies within the region. Although all of Pennsylvania, with exception of the southeast and northwest counties, merits inclusion within the threshold boundary line, only portions of the southwestern five counties are enclosed by 40 percent or more of the respondents. South of the Mason-Dixon Line the threshold boundary widens dramatically. Here respondents include about three-fifths of Kentucky and all but west Tennessee within the region and ample portions of the Piedmont from Virginia south through Georgia. The cognitive region reaches its greatest width, over 525 miles,

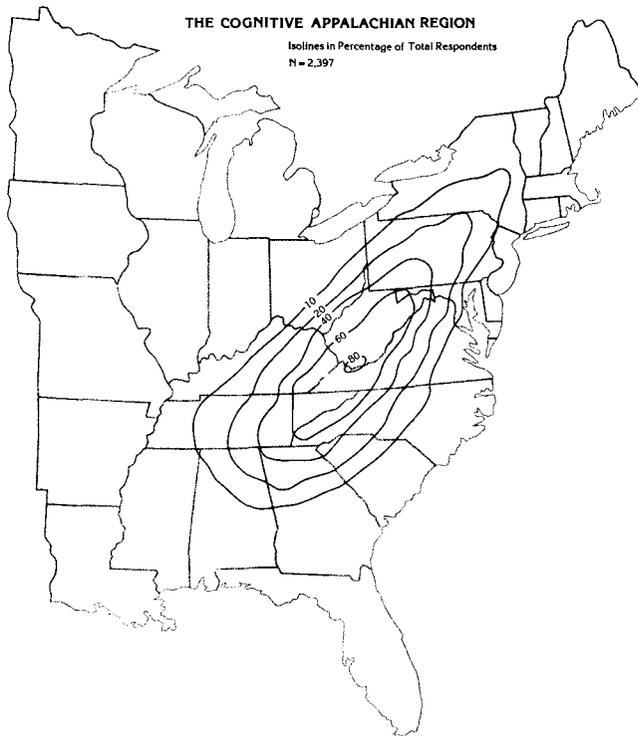


Fig. 2. The Appalachian region as perceived by all respondents.

through Tennessee and North Carolina. The core of the region within the 80 percent isoline is small, certainly much smaller than would be expected, and corresponds almost exactly with Mercer County, West Virginia.

*COMPARISON OF THE COGNITIVE APPALACHIAN REGION AND THE ARC REGION.* To enable a systematic comparison of the cognitive map and the ARC region, a grid of squares (each square 37.5 miles on a side) was overlain on each respondent's cognitive map. All squares included within the respondent's regional boundary were scored one, those outside were scored zero. Grid values were totaled and mapped as the percentage of agreement between the cognitive and ARC regions (Fig. 3). Initial examination reveals dramatic differences of agreement all around the regional perimeter. The steepest gradient in agreement

is on the east side. Here only about two-fifths of the respondents agree with the ARC on the location of the regional boundary in Virginia and the Carolinas. Included on the maps is a five percent isoline that is employed as a heuristic device to give graphic representation to empty areas that lie between the 10 percent threshold line and the ARC boundary. The 5, 10, and 20 percent isolines are congruent to the ARC boundary along this portion of the line, suggesting that the eastern cognitive boundary for 40 percent of the respondents lay beyond the ARC region. Apparently many respondents thought that the Blue Ridge and segments of the Piedmont were within the region whereas the ARC chose to exclude them. That this is the case is confirmed by examining the extension of the ARC boundary eastward to enclose Stokes and Forsyth counties (Winston-Salem) in North Carolina. Here the eastward projection of the ARC boundary reveals a 10 percent isoline of agreement with the perceptual surface. The isolines of agreement on the west side are more evenly spaced away from the most intense core of agreement which again appears in southern West Virginia. The implication here is that 10 percent of the respondents, or less, agree that the ARC boundary extends so far west. The waves in the outermost line in southeastern Ohio reflect the indented character of the ARC boundary that extends far enough west to reveal the 5 percent isoline of agreement. Had the ARC boundary been rectilinear, the 5 percent line would have been congruent to it along the west side.

In the north, few respondents agree with the extension of the boundary into Pennsylvania and even fewer agree that it should include southern New York. The wide interval between isolines in the north suggests a very flat surface of agreement. The corresponding slope in the zone of agreement in the south is somewhat steeper; the interval distance is one-half that of the north. This difference may reflect a southern bias in the Appalachian cognitive region. Nevertheless, the difference is not sufficient to include more than three or four counties in northeastern Alabama within the 20 percent isoline of agreement. South of that point, one-tenth or less agree with the ARC that western Alabama and northeastern Mississippi belong with the region.

The next step in the analysis was to disaggregate the total population of respondents into regional subsets to find out whether or not the perception of Appalachia, and agreement with the ARC regional boundary, had any relationship to the regional residence of the respondents. Upon initial examination, each of these subgroup maps shows strong similar-

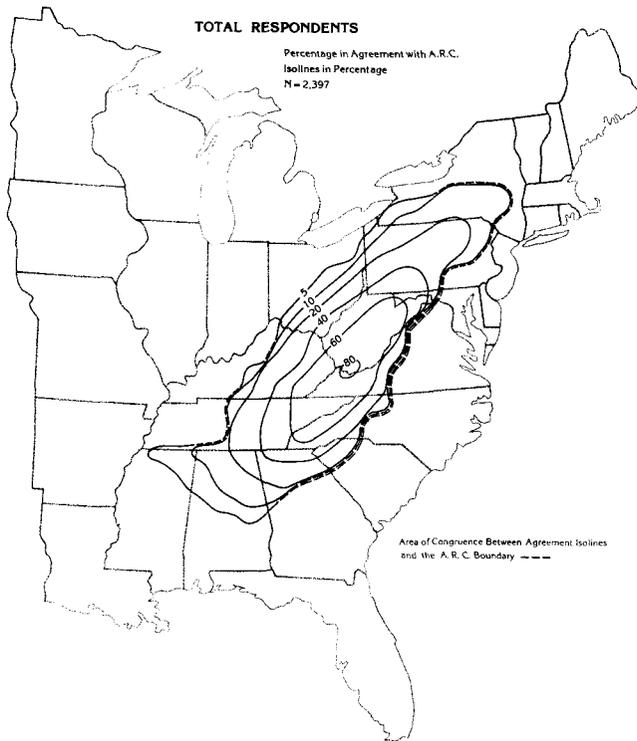


Fig. 3. Percentage of total respondent group in agreement with the ARC.

ities to the aggregate map in their zones of agreement with the ARC region (Figs. 4, 5, 6, 7). Closer study reveals that there are a number of significant differences between subgroups in core area location and intensity as well as in the spacing and alignment of the agreement isolines. The cognitive agreement map of the respondents from within Appalachia, for example, delimits a much larger core area of 80 percent agreement, enclosing all or part of six counties in West Virginia and a dozen counties in Virginia (Fig. 4). The 60 percent isoline encloses a larger share of West Virginia, reaching almost to the Ohio Valley, and an additional row of counties in east Tennessee, but it is offset to the east relative to the ARC region.

One possible explanation of this pattern is the defensive projection phenomenon noted by social psychologists. (15) This process appears to operate when people who have high self-esteem are confronted with information that some of their personal or familial attributes are unde-

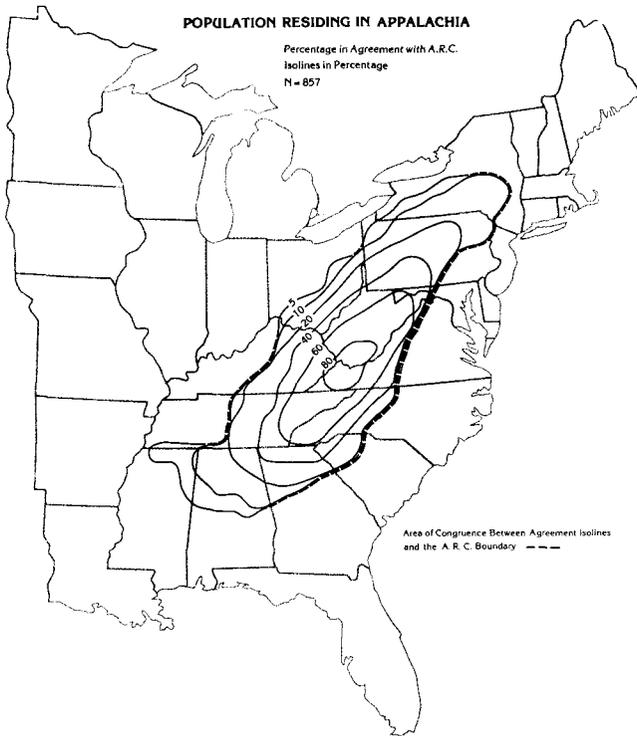


Fig. 4. Percentage of population residing in Appalachia in agreement with the A.R.C.

sirable. A sense of dissonance results and in order to resolve the conflict, they may project the negative attribute to others that they believe to be liked or respected. They would then rationalize that if liked and respected persons possess the same trait as themselves, that trait might not be so disagreeable and dissonance is reduced. The implication is that if one assumes that residents of Appalachia perceive selected attributes in a negative manner, they would respond to a cognitive map test by including non-Appalachian areas. A possible flaw in this line of reasoning is the assumption that Appalachians perceive themselves to have negative qualities. In fact, it may be that Appalachian residents hold themselves and their surroundings in high self-esteem compared to the way outsiders see them. (16)

The subgroup comprising those who live outside Appalachia but within states that have portions of their areas in the region had lower

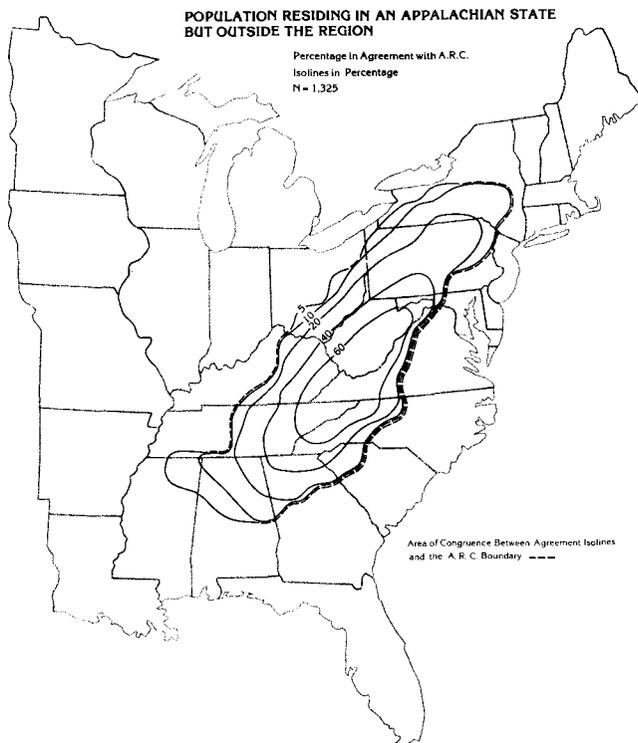


Fig. 5. Percentage of population residing in an Appalachian state but outside the region in agreement with the ARC.

levels of core area agreement (Fig. 5). Here the area of 80 percent agreement is absent, and the 60 percent isoline shrinks back somewhat from the comparable position on the Appalachian resident's map. A tentative explanation for this abrupt change in cognitive surfaces may be that many Appalachian residents freely admit that they live in the region (Fig. 4). Perhaps a better explanation than defensive projection for the larger size of the regional core portrayed by Appalachian residents is that this group is likely to have some considerable knowledge of how far their region extends. On the other hand, residents of the non-Appalachian sections of those states may think that their state does not exhibit those characteristics which stereotype Appalachia. Consequently, western Virginia does not receive sufficient support from state residents for being a part of Appalachia and it drops from the core area.

The cognitive agreement maps of the last two groups seem to reflect

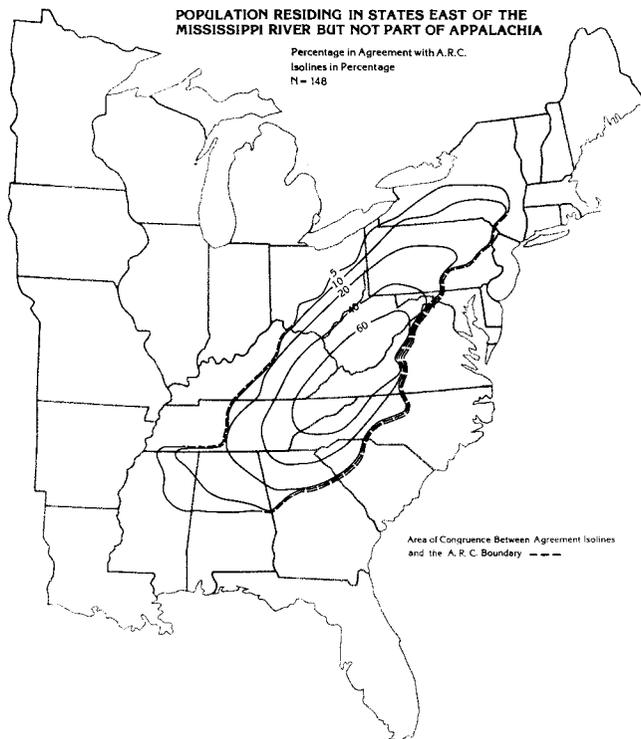


Fig. 6. Percentage of population residing in a non-Appalachian state east of the Mississippi River in agreement with the ARC.

a kind of “cognitive decay factor” in that the farther the respondent’s county of residence is from the region, the more amorphous the perceptual boundary becomes (Figs. 6 and 7). Those respondents from states that lie east of the Mississippi River but are outside the region also exhibit a lower level of cognitive intensity than the map of the Appalachian residents (Fig. 6). The 80 percent core threshold is not reached, and the southern bias of the region’s axis becomes more pronounced. Two-fifths of the respondents would include only a tiny portion of Pennsylvania, and the 20 percent isoline of agreement slips south to Centre and Allegheny counties. In the south, the 10 percent isoline slips deeper into Alabama and even crosses into Mississippi to include portions of two counties.

The tendency toward a cognitive region with a southern bias is also evident in those respondents from other states (Fig. 7). The 20 percent

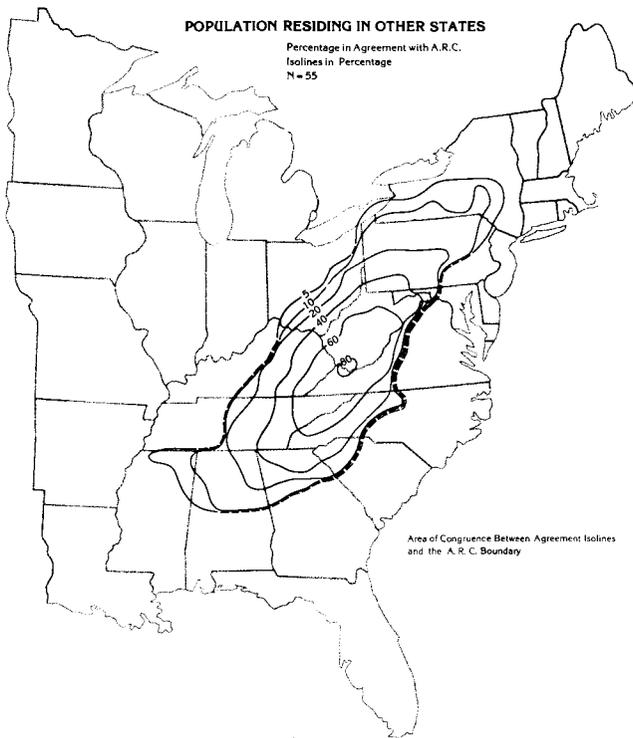


Fig. 7. Percentage of population residing in other states in agreement with the ARC.

isoline shrinks farther west and south in Pennsylvania, and is not congruent with the 5 percent agreement isoline. South of the Mason-Dixon Line the 20 and 40 percent isolines extend slightly farther east and west, encroaching on the ARC boundary and almost intersecting lines of lower values as compared to the Appalachian residents' map (Fig. 4). While a southern bias appears in the region as perceived by residents of the other states, the overall regional boundary encloses a more extensive area than that of the Appalachian residents. This is suggested by the shorter length of congruence between the 10 percent threshold cognitive boundary and the ARC boundary.

**CONCLUSION.** The cognitive Appalachian region is substantially shorter than the ARC region. Although a threshold isoline of 10 percent agreement with the ARC boundary extends from Alabama to New York, the

boundary line drawn by a majority of the respondents (as exhibited by the 60 percent isoline) encloses only one-third of the ARC region along the north-south axis and about half its width in the east-west dimension. The respondents tend to perceive only the south central portion of the region as Appalachia. Certainly this is the area that seems to be the most widely publicized as having the full range of negative Appalachian-associated characteristics: coal mining, flooding, environmental degradation, unemployment, poverty, and isolation. The mental maps of respondents from outside the Appalachian region appear to enclose a larger portion of south central Appalachia within their threshold boundary, thereby approximating more closely the ARC boundary than the other groups. Should the ARC reconsider its boundaries in light of its socioeconomic goals for the region, however, it would do well to consider the cognitive map of those who reside in the region since it is that population group the ARC purports to be helping.

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- (1) David E. Whisnant, *Modernizing the Mountaineer: People, Power, and Planning in Appalachia* (New York: Burt Franklin, 1980), p. 134.
- (2) Neven M. Fenneman, "Physiographic Divisions of the United States," *Annals of the Association of American Geographers*, Vol. 6 (1917), pp. 46-59.
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- (6) Ann DeWitt Watts, "Does the Appalachian Regional Commission Really Represent a Region?," *Southeastern Geographer*, Vol. 18 (1978), pp. 19-36.
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- (8) Kevin R. Cox and Georgia Zannaras, "Designative Perceptions of Macro-Spaces: Concepts, a Methodology, and Applications," in Roger M. Downs and David Stea (eds.), *Image and Environment: Cognitive Mapping and Spatial Behavior* (Chicago: Aldine, 1973), pp. 162-178.
- (9) Ruth Feser Hale, "A Map of Vernacular Regions in America," unpublished doctoral dissertation, University of Minnesota, 1971, pp. 54, 166.
- (10) See, for example, Peter R. Gould, "The Black Boxes of Jönköping: Spatial Information and Preference," in Downs and Stea, footnote 8, pp. 235-245; Peter Gould and Rodney White, *Mental Maps* (Baltimore: Penguin, 1974); D. Griffin, "Topographical Orientation," in E. G. Boring, H. S. Langfeld, and H. P. Weld, *Foundations of Psychology* (New York: Wiley, 1948); D. C. D. Pocock, "Environmental Perception: Process and Product," *Tijdschrift voor Economische en Sociale Geografie*, Vol. 64 (1973), pp. 251-257; and Thomas F. Saarinen, "Student Views of the World," in Downs and Stea, footnote 8, pp. 148-161.

- (11) For a discussion of problems associated with measuring environmental images, see Douglas Pocock and Ray Hudson, *Images of the Urban Environment* (New York: Columbia University Press, 1978), pp. 36–47.
- (12) These maps are based upon three grids (each a matrix that is  $36 \times 32$  coordinates) which give the absolute number of times a coordinate has been included by an individual, the relative frequency for each coordinate, and the percent agreement between each coordinate and the ARC region. Three such maps, for example, could be produced for freshman and sophomore students who reside in the Appalachian portion of Kentucky and then compared with similar maps of students from non-Appalachian Kentucky.
- (13) An individual was considered to be from Appalachia if his county of permanent residence was within Fenneman's four physiographic subprovinces of Appalachia.
- (14) The ARC region is approximately 1,125 miles long and 250 miles wide if measured along the same axis.
- (15) Robert A. Wicklund and Jack W. Brehm, *Perspectives on Cognitive Dissonance* (Hillsdale, New Jersey: Lawrence Erlbaum, 1976), p. 202.
- (16) Richard Ulack and Karl Raitz, "Perceptions of Appalachia," unpublished manuscript, 1981.