Climatic Preference

Jeffrey T. Lutz

Researchers within the discipline of geography seek to achieve an enhanced comprehension of man's perception of the world. Therefore, environmental perception is a subject of great consequence to geographers. Understanding of the sources of variance in environmental perception is essential to an understanding of variation in man's environmental behaviors.

The mental image is one of the major determinants of spatial behavior; and spatial images are an individual's cognitive representation of the spatial environment, and are a summary of what he considers meaningful about the environment.

Climate is a strategic factor affecting man's responses to the complex environment, and climate can be an important mental image. Man's perception of climate can influence his adjustment to the environment. Good climate can be an important factor entering into locational decisions.

Climatic perception is the focus of the present research. The subjects consisted of college students, individuals who in age and education comprise the most migratory element of the American population. The sample comprised in-state college students from different regions of the United States. The states of Vermont, Minnesota, North Carolina and Arizona were selected as being representative of the Northeastern, North-Central, Southern and Western regions respectively.

A questionnaire was employed in an attempt to determine how students perceive the climatic
desirability of states in the conterminous United States. The questionnaire was designed to allow both qualitative and quantitative analysis of climatic perception. The questionnaire contained three types of questions: 1) general information about each student consisted of such items as previous residence outside their state and traveling experience; 2) an evaluation of the influence of individual climatic elements in the students' perception of a desirable climate; 3) a section pertaining to the students' climatic preferences in terms of ranking the states in the conterminous United States and listing their five most desirable and five least desirable states.

Regional trends were anticipated in the students' perceptions of desirable and undesirable states based on climate. An attempt was made to explain any striking anomalies and hypotheses offered as to the general trends in perception. Since the preference for different regions presumably reflects perceived differences in economic, social and cultural conditions, and not merely differences in the natural environment, interpretation of the climatic preference alone is difficult.

The significance of socio-economic and cultural influences is not refuted here, however. This study is primarily concerned with perception based on climate. Undoubtedly, cultural and socio-economic factors influence the students' perceptions. Accepting this, the present analysis assumes that students base their perceptions on climate.

Perception of Climatic Desirability

Initially, the students' opinion concerning the influence of significant climatic factors in their perception of a desirable climate was evaluated. The students ranked the influence of specific climatic factors on a scale as very strong, strong, moderately strong, weak, or no influence. The importance attributed by a majority of students to the change of seasons, temperature, sunshine, humidity and precipitation, is displayed in Table 1.

Clearly, all the students feel that both temperature and precipitation exert a strong influence upon the desirability of climate. Humidity and sunshine are less significant in the eyes of the Vermon ters, whereas the Arizona students view these climatic elements as very important. The greatest discrepancy in viewpoints arose over the influence of the change of seasons. It appears that the "northern" students perceive the change of seasons as a very influential aspect of climate. In contrast, the "southern" students do not consider the change of seasons to be as strong a factor affecting the desirability of climate.

Next the students were requested to select which climatic element (including temperature, amount of sunshine, humidity and precipitation) is most important in evaluating the desirability of a place. The resultant student opinion is shown in Table 2.

Over half the total respondents (including the majority from each sample) view temperature as the most important climatic element.
### TABLE 1

Students' Evaluation of the Influence of Climatic Elements in their Perception of a Desirable Climate, Mode

<table>
<thead>
<tr>
<th>State</th>
<th>Change of Seasons</th>
<th>Temperature</th>
<th>Humidity</th>
<th>Precipitation</th>
<th>Sunshine</th>
</tr>
</thead>
<tbody>
<tr>
<td>North Carolina</td>
<td>Moderately Strong</td>
<td>Strong</td>
<td>Strong</td>
<td>Strong</td>
<td>Strong</td>
</tr>
<tr>
<td>Vermont</td>
<td>Very Strong</td>
<td>Strong</td>
<td>Moderately Strong</td>
<td>Strong</td>
<td>Moderately Strong</td>
</tr>
<tr>
<td>Arizona</td>
<td>Moderately Strong</td>
<td>Strong</td>
<td>Very</td>
<td>Strong</td>
<td>Very</td>
</tr>
<tr>
<td>Minnesota</td>
<td>Strong</td>
<td>Strong</td>
<td>Strong</td>
<td>Strong</td>
<td>Strong</td>
</tr>
</tbody>
</table>

### TABLE 2

Students' Perception of Which Climatic Element is Most Important in Evaluating the Desirability of a Place, In Percent

<table>
<thead>
<tr>
<th>State</th>
<th>Temperature</th>
<th>Humidity</th>
<th>Precipitation</th>
<th>Sunshine</th>
</tr>
</thead>
<tbody>
<tr>
<td>North Carolina</td>
<td>53.4</td>
<td>21.9</td>
<td>11.5</td>
<td>13.2</td>
</tr>
<tr>
<td>Vermont</td>
<td>52.0</td>
<td>21.0</td>
<td>13.0</td>
<td>14.0</td>
</tr>
<tr>
<td>Minnesota</td>
<td>57.8</td>
<td>15.0</td>
<td>10.2</td>
<td>17.0</td>
</tr>
<tr>
<td>Arizona</td>
<td>48.0</td>
<td>18.4</td>
<td>6.6</td>
<td>27.0</td>
</tr>
</tbody>
</table>
Humidity is also perceived as the most influential climatic element by at least 15 percent of the students from each university. Sunshine and precipitation are generally discerned as less important, except in the case of Arizona (a state which has abundant sunshine), where over one-fourth of the students feel that sunshine exerts a prominent influence upon the desirability of climate.

**Influence of Travel Experience**

Theoretically, travel experience constitutes an important factor which can influence a student's perception of the climatic desirability of a state. It is assumed that the more one knows about the weather conditions and climate of a state, the better equipped one is to make a reasonable evaluation of climatic desirability. In the present study, students indicated the number of times they had traveled in each of the states of the conterminous United States. However, since the temporal extent of travel was not indicated, one is limited to making generalizations about the relationship between travel experience and the perception of climatic desirability.

Since significant climatic elements such as temperature, amount of sunshine, humidity, and precipitation can exhibit pronounced changes between seasons, weather conditions during a summer vacation or one holiday season do not necessarily represent an area's climate. However, it is assumed that the student would still gain impressions from travel experience which would influence the view of climatic desirability.

As shown in Table 3, each region in the United States had been visited by at least 10 percent of the students from each university sample. As a region, the Middle Atlantic states were traveled through most frequently, with the state of New York receiving the greatest percentage of travelers.

### TABLE 3

Average Regional Travel Experience
By Sample, In Percent

<table>
<thead>
<tr>
<th>Region</th>
<th>North Carolina</th>
<th>Vermont</th>
<th>Arizona</th>
<th>Minnesota</th>
</tr>
</thead>
<tbody>
<tr>
<td>New England</td>
<td>18</td>
<td>77</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Middle Atlantic</td>
<td>43</td>
<td>74</td>
<td>25</td>
<td>18</td>
</tr>
<tr>
<td>E. North Central</td>
<td>18</td>
<td>29</td>
<td>28</td>
<td>53</td>
</tr>
<tr>
<td>W. North Central</td>
<td>10</td>
<td>15</td>
<td>24</td>
<td>59</td>
</tr>
<tr>
<td>South Atlantic</td>
<td>64</td>
<td>39</td>
<td>15</td>
<td>17</td>
</tr>
<tr>
<td>E. South Central</td>
<td>44</td>
<td>16</td>
<td>19</td>
<td>18</td>
</tr>
<tr>
<td>W. South Central</td>
<td>21</td>
<td>14</td>
<td>32</td>
<td>23</td>
</tr>
<tr>
<td>Mountain</td>
<td>12</td>
<td>16</td>
<td>48</td>
<td>36</td>
</tr>
<tr>
<td>Pacific</td>
<td>12</td>
<td>15</td>
<td>45</td>
<td>23</td>
</tr>
</tbody>
</table>
A majority of students from each sample had considerable travel experience throughout their respective regions, and approximately 15 to 20 percent of the respondents had traveled extensively throughout the United States. California, Colorado and Florida attracted the greatest percentage of visitors (over 35 percent of all the students had visited one of these states).

Nevertheless, for the vast majority of students, travel outside their respective regions was quite limited. This dearth of exposure to climatic conditions in other parts of the United States must be considered in the overall assessment of the students' perception of climatic desirability.

Climatic Preference

The students were requested to rank the states in the conterminous United States as either climatically desirable, indifferent, or undesirable. Since the terms "desirable" and "undesirable" express strong viewpoints, discussion will be confined to the students' perception of states as either climatically desirable or climatically undesirable. The resultant student opinion is illustrated in Figures 1 through 3.

Climatic Preference Illustrations

Figure 1. Climatic Preference: View From Minnesota and Arizona
Figure 2. Climatic Preference: View From Vermont and North Carolina

Figure 3. Climatic Preference: Total View
Discussion will commence with the perspective from Minnesota (Figure 1). Excluding Florida, Michigan, Wisconsin and their home state, less than 40 percent of the Minnesota students view the states east of the Rocky Mountains as climatically desirable (Figure 1a). New Jersey, Alabama and Mississippi are seen as the least desirable states, and most states in the Southeast and Midwest fare poorly (even the neighboring Dakotas project desirable images to fewer than one-quarter of the Minnesotans).

In contrast to the proximate Midwestern states, 69 percent of the respondents view their home state favorably, and 28 percent feel that Minnesota offers the most desirable climatic conditions in the United States. In comparison, 82 percent of the sample consider Colorado as climatically desirable and 15 percent view Colorado as the most desirable state in the United States. In addition to Colorado, the climatic conditions prevailing in the western states of Montana, Washington, Oregon, California, and Arizona are viewed positively by over 50 percent of the Minnesotans.

In contrast, the climatic conditions in Mississippi, the Dakotas, New York and New Mexico are viewed as unattractive by over 35 percent of the Minnesotans (Figure 1b). Over one-tenth of the sample feel that North Dakota is the least desirable state in the United States.

An examination of Figure 1b also reveals that the Plains states of Nebraska, Kansas and Texas, and the states of the Deep South (excluding Florida) are perceived negatively by more than one-fourth of the Minnesota students. Elsewhere (excluding the aforementioned states), the northern and western states (except for Nevada) are seen as climatically unappealing by fewer than 25 percent of the respondents.

In the eyes of Arizona students (Figure 1c) there is a pronounced contrast in climatic desirability between the western states and those states located east of the Rocky Mountains. Less than 28 percent of the sample perceive the eastern states (excluding Florida) as attractive. On the other hand, all of the western states (exclusive of Idaho) project images of appealing climatic conditions according to more than one-third of the respondents from Arizona.

A vast majority (94 percent) of the Arizonans are attracted to the climate of their home state (and 65 percent consider Arizona to be the most desirable state in the United States). Over 60 percent of the sample envision of the proximate states of Colorado (78%), New Mexico (62%), and California (southern 83% and northern 70%) as climatically appealing.

Over one-half of the students from Arizona discern the climatic conditions prevailing in New York and Mississippi as unattractive (Figure 1d). In fact, 15 percent of the sample consider New York to be the least desirable state in the United States. In general, the states of the North-Central, Northeastern and Southeastern United States project images of an unappealing climate according to at least one-fourth of the respondents.

In contrast, Arizona and its neighboring states (with the exception of Nevada) and Oregon, are viewed negatively by less than
14 percent of the Arizonans. Florida (sunshine factor) is the only state east of the Rocky Mountains which fares as well (less than 15 percent of the sample perceive Florida as undesirable).

Ninety-four percent of the Vermonters feel that their home state is climatically attractive (Figure 2a), and over 60 percent view Vermont as the most desirable state in the United States. Climatic conditions in the neighboring states of New Hampshire, Maine and New York, in addition to Colorado, Montana and the Pacific West Coast states of Washington, Oregon and the northern part of California are also viewed very favorably.

In general, the climatic conditions prevailing in southern states are less appealing (even southern California and Florida are envisioned as desirable by fewer than 40 percent of the Vermonters). In particular, the states of the Deep South do not project desirable images in terms of climate.

Clearly, the southern states are discerned as climatically displeasing by the Vermonters (Figure 2b). Excluding New Jersey (perceived pollution factor), the states of Alabama, Mississippi, Georgia and Texas are viewed negatively by the most respondents. According to 35 percent of the Vermonters, Florida projects an undesirable image; and at least 13 percent of the sample envision either Alabama, Texas or Florida as the least desirable state in the United States.

It is notable that in the eyes of the Vermonters, southern California is more undesirable (29%) than northern California (5%) in terms of climate. In contrast to the generally negative image of southern states, the states in northern New England, the Pacific Northwest, and Colorado were viewed negatively by less than one-tenth of the respondents.

In the eyes of the students from North Carolina, there is a pronounced contrast between the climatic desirability of northern and southern states (Figure 2c). Excluding Mississippi and Alabama, the states of the Southeast fare most favorably. More than 75 percent of the respondents feel that North Carolina, Virginia and Florida project images of desirable climate. In fact, North Carolina and Virginia are viewed by the highest percentage of students (42% and 15%, respectively) as the most desirable states in the United States. California and Colorado are also perceived as climatically appealing by over one-half of the sample.

According to the North Carolinians, northern states generally project less desirable images of climate. In particular, the North-Central states are less desirable (e.g., the Dakotas are considered climatically pleasing to less than 12 percent of the sample).

In general, the North Carolina students consider the climatic conditions prevailing in the northern states as decidedly less appealing than the climate of the South. (Figure 2d) Mississippi and New Mexico are the only states in the southern half of the nation which are depicted negatively by over 35 percent of the respondents.

The sample from North Carolina tends to perceive climate as progressively less pleasing the further north one travels. Over 45
percent of the respondents picture the climate of the northern border states including Maine, New York, Michigan, Minnesota and North Dakota, as unattractive. Thirteen percent of the sample feel that the climate of Maine is the least desirable in the United States.

The "total view" (Figure 3) is a composite perspective, reflecting the input from each university sample. However, in an attempt to avoid local bias (where, in theory, the students would display a preference for proximate states), the total view consists of the average viewpoint from the three university samples located the greatest distance from each state.

Those states perceived as climatically pleasing (Figure 3a) by the greatest percentage of respondents include: Colorado (85%), California (northern 67% and southern 53%), Florida (50%) and Oregon (49%). Clearly, the students are attracted by the appealing images of climate (and presumably pleasant scenery) in the West Coast states, Colorado and Florida.

At least 30 percent of the sample perceive the remainder of the western states (excluding Idaho and Utah) as climatically attractive. In contrast, less than 30 percent of the respondents view the states east of the Rocky Mountains (except for Florida, Kentucky and Vermont) positively. In particular, the states of the Deep South fare poorly, as less than 13 percent of the respondents envision Georgia, Alabama, Mississippi and Louisiana as projecting images of appealing climatic conditions. In fact, over 40 percent of the sample perceive these states of the Deep South as climatically displeasing (Figure 3b).

There is pronounced difference in the climatic undesirability between the western states and those states located east of the Rocky Mountains. Note that only one state east of the Rockies (Kentucky) is viewed as climatically undesirable by less than 15 percent of the sample. Climatic conditions in the states of Mississippi and New York are perceived negatively by over 45 percent of the respondents. In addition, at least 35 percent of the sample view both the northern states of Maine, Minnesota and North Dakota, and the southern states of Texas, Louisiana, Alabama and Georgia as climatically displeasing.

In contrast, the only western states which project negative images to more than 25 percent of the respondents are New Mexico, Arizona and Nevada. In general, the climatic conditions prevailing along the west coast and across the northern Rocky Mountain states are not viewed as strongly undesirable.

Summary

The difference in perception among students from different universities was evident, with a propensity for students to prefer the climate of their immediate region (particularly the home state). According to a majority of students, the states of Colorado, California, Oregon and Florida offer desirable climatic conditions. Apparently, the students are attracted by both equable climate and pleasant scenery. The image of the "sunshine states" including Florida, California and Arizona, is generally appealing to the students.

In contrast, both the northern border states and states of the
Deep South (excluding Florida) are generally discerned as climatically undesirable. It is hypothesized that the students are displaying an aversion to perceived seasonal extremes, and generalizing about annual climatic conditions based upon the extreme seasons only. For example, it appears that the low winter temperatures in the northern border states are not appealing to a majority of the students. Undoubtedly the Gulf Coast states are associated with oppressive, sultry conditions during the summer season when high temperatures and high humidity readings prevail.

There is a pronounced contrast in the perceived climatic desirability of "western" and "eastern" states. In general, the climatic conditions prevailing in those states located east of the Rocky Mountains are notably less attractive to a majority of the students. On the other hand, the lure of the "western" states (particularly Colorado, California and Oregon) is strong.

Main, Texas and New Mexico are examples of states which project contrasting images. At least 27 percent of the respondents view these states as climatically desirable, whereas over 34 percent of the sample perceive these same states as unappealing in terms of climate.

Although the present analysis assumes that students base their perceptions on climate, it is acknowledged that the respondents could be considering general environmental preferences (including the image of the great outdoors, mountains, skiing and recreational resources) and socio-economic and cultural factors, in addition to climate. Otherwise, for example, how could one explain the fact that Kentucky (blue grass country) and Vermont (skiing) are generally viewed as more desirable than the surrounding states?

Application

The problem of how man perceives his environment is an outgrowth of the larger system of man's spatial inter-relationships with his environment which has traditionally been of major concern to geographers. Physical geographers have emphasized the importance of further study of the climatic environment and how man reacts to this part of the environment. Knowing that man's behavior is determined at least in part by his perceptions, it is imperative that an individual's perception of climate be assessed prior to a full understanding of his behavior in relationship to that climate.

It is assumed that climate is very much a contributing factor to the appeal of an area. Granted, the preference for different regions presumably reflects perceived differences in economic, social and cultural conditions, and not merely differences in the natural environment. However, one would conjecture that if an individual's perception of an area's climate is negative, then theoretically that area would be avoided. Likewise if the individual's perception is positive, then that area would be more attractive for a place to reside, ceteris paribus.

In a recent article, Svart presents a thorough review of literature pertaining to environmental preference migration. Frequent reference is made to discussions of
the influence of climate in migration decisions. Back in 1954, Edward Ullman suggested that much of the interregional migration in the United States could be explained by individual preferences for a "pleasant" climate and for other aspects of a desirable natural environment. In an attempt to determine precisely what kind of natural environments people do want Svart (1973) investigated specific environmental preferences, as distinct from general preferences. The job market was considered the most critical characteristic of regions when respondents were making migration decisions, but the natural environment (including climatic variables) was also regarded as important. Preferred region attributes included low population density, winter sunshine, warm and dry summers, infrequent but moderate precipitation, mountainous relief, coastal location, surface water, and diverse vegetation, Svart found that past experience, age, and sex strongly influenced environmental preferences.

Considering the age factor, behavioral research suggests that climate, particularly temperature, becomes an increasingly important consideration in migration decisions as people age. This may help explain why, from 1965 to 1970, more than 75 percent of all elderly net in-migration was to Florida, Arizona, Texas and New Mexico. In the present study, those states (including Colorado, California, Oregon and Florida) which are viewed as climatically desirable by a majority of the students, are experiencing high in-migration rates and population growth. It is hypothesized that climatic preference will become an increasingly more important aspect of environmental preference migration.

Since climate can be an important factor entering into the locational decision, the present research should be expanded to include an examination of the climatic preference of a representative cross-section of the population. Variables such as age, sex, race, level of education, specific travel experience, and the influence of informational flows (including advertising) should be taken into consideration in evaluating an individual's climatic preference.
FOOTNOTES


3. It was found to be advantageous to restrict the study sample to in-state college students attending introductory geography classes at four universities. The participants included students from the University of Vermont, Mankato State College (Minnesota), the University of North Carolina at Chapel Hill, and Arizona State University. The sample totaled 1,139 valid responses.

4. Despite this consideration, the pronounced differential in travel experience apparently did not alter significantly the average view for each respective group. It is notable that within each university sample, both students with extensive travel experience and those limited to travel within their respective states, exhibited similar views of general climatic desirability.

5. The main exception being the view from Minnesota where the neighboring Dakotas project negative images. Gould also found this to be true in his pioneering work on mental maps in 1966. See Peter Gould, On Mental Maps. Michigan Inter-University Community of Mathematical Geographers, Discussion Paper No. 9, Ann Arbor, Michigan; Department of Geography, University of Michigan, 1966.


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