

# RESIDENT ATTITUDES TOWARD SELECTED CHARACTERISTICS OF STREET TREE PLANTINGS<sup>1,2</sup>

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**Abstract.** A survey of social attitudes toward selected characteristics of street tree plantings in five midwestern cities indicates that trees are aesthetically desirable in urban settings and that street trees over twenty-five feet tall are aesthetically preferable to smaller trees. Street tree planting densities of one tree per house appear satisfactory to a large segment of the population and street tree size preference is largely independent of a person's age, degree of education and sex.

measurement of response to the picture presentations agrees favorably with similarly measured on-site responses to the same scenes." In other words, if a slide or photograph accurately depicts a scene, then a person viewing the picture or slide is likely to react to the scene as if he were there, as indicated by responses to adjective pairs used in semantic differential scaling.

## Methods

The survey was composed of four basic parts. Each is briefly described below:

1) Questions were asked to get an idea of the respondent's current neighborhood street tree situation as a point of reference. They were asked about the dominant size class present, the density or spacing of street trees, and whether they were satisfied with these two characteristics of their neighborhood street tree planting, or if they would prefer to see alterations.

2) Another portion of the survey utilized semantic differential adjective pairs or attitude scales, to determine respondent reactions to a large tree and a small tree of similar form and to see if street trees favorably affect perceptions of residential street scenes.

3) People were asked to view paired street tree scenes and select the scene "most pleasing to the eye" based on the trees shown. Each pair was composed of a scene with street trees less than 25 feet tall and a scene with trees over 25 feet tall. Since the trees were shown at some distance, scenes of immature, potentially large trees, were sometimes used to represent small trees, with the expectation that the average person would not be noticeably affected by the substitution. Photographs were all taken in residential settings. Trees were matched as nearly as possible in qualities other than size of trees.

The impetus for this study came from the popular promotion of small ornamental trees for use as street trees and as major components of urban landscapes by tree managers and nurserymen, at the expense of what they have termed misplaced "forest giants" or the traditional native trees that have been planted on streets for many years. In addition to the obvious attributes of small size, not the least of which is low maintenance in many instances, claims that people actually prefer small trees led us to question the validity of these recommendations.

Unaware of any specific attempts to obtain the thoughts of the public on the type, kind, or size of trees that appealed to them, a survey was developed that would begin to sketch the meaning that trees hold for people in urban environments with emphasis on street trees and focusing on the size variable in particular. The hypothesis was that the public, in fact, had no preference as to large or small trees, with large being defined as over 25 feet tall at maturity.

Color photographs of trees and street scenes were used in the survey as a basis on which people were asked to scale their perceptions and indicate what aesthetically pleased them. The use of photographs in the survey can be attributed to the work of Shafer and Richards (1973). Results indicate that when color photographs and slides of scenes capture "most of the variation of natural and man-made environments, the adjective pair

<sup>1</sup>Michigan Agricultural Experiment Station Journal Article 8827.

<sup>2</sup>Presented at the annual conference of the International Society of Arboriculture in Toronto, Ontario, Canada in August 1978.

Difficulties were experienced in obtaining perfect matches.

4) Respondents were asked to supply some basic demographic data as to their age, sex, level of education, and whether they lived in a city, town, suburb, or rural area.

**Populations Surveyed.** To date five midwestern cities in the two-state area of Michigan and Illinois have been studied. The Michigan cities surveyed were East Lansing, Midland, and Saginaw. In Illinois the Chicago suburbs of Highland Park and Wheeling were examined. City selection criteria were based on locational convenience and manpower availability.

Slight modifications exist between the questionnaires used in the (Saginaw-Midland) surveys and the (East Lansing, Highland Park, and Wheeling) surveys. Some of the questionnaires used in the latter three cities repeated the questions involving verbal size and density preference in order to explore the possibility that the survey instrument could affect verbal preferences. Also, the semantic differential questions were omitted, or spot checked, in East Lansing, Highland Park, and Wheeling to expedite the survey procedure.

Numbers of interviewees ranged from highs of 105 and 100 for Saginaw and Midland respectively, to 71 in Highland Park, 43 in East Lansing, and 25 in Wheeling. Surveys were conducted door-to-door, except Midland, which was sampled at a shopping mall.

Results will be discussed in terms of broad overall trends evident in an averaging of responses for all cities combined, which are supported by individual city response patterns. Discrepancies will be noted by city on a point-by-point basis.

## Results

**Semantic Differential.** The semantic differential is a tool widely used by social psychologists and others interested in measuring the meaning which concepts hold for individuals. In the current application, the semantic differential technique was used to elicit personal attitudes regarding small and large shade trees as well as the amenity value trees hold for individuals when associated

with residential street plantings. Composed of adjective word-pairs of opposite meaning separated by a series of seven steps, respondents were able to register strong, moderately strong, moderate, and neutral reactions to selected semantic aspects of four scenes reproduced as 5"×7" color photographs.

Scenes were evaluated on the 27 adjective scales used by Schafer and Richards (1973) for a study of viewer reactions to outdoor scenes and photographs of those scenes and by Tucker (1955) for measurement of reactions to paintings.

In this study, we examined responses to an open grown twenty-five foot silver maple (*Acer saccharinum*) and a sixty foot black maple (*Acer nigrum*) of similar form growing on a golf course. Respondents also rated two residential street scenes, one planted to street trees of varying sizes and one devoid of street trees.

Analysis of data has been confined to a graphic representation of the arithmetic mean obtained for the 27 scales by photograph for each sample population. A composite graph for sample populations in Saginaw and Midland is shown in figure 1. This represents the attitude of a hypothetical "average person" toward a given type of scene.

Sample populations in Midland and Saginaw demonstrated a remarkable degree of similarity in their mean semantic responses for the two specimen scenes. The fact that there was no evident preference difference attributable to tree size may be due to the lack of an object providing a sense of scale in the photographs.

Surprisingly, the street scene with street trees was viewed essentially identically to the single tree specimen photos in both cities. Variation was limited to minor points attributable to obvious scene differences like symmetry, degree or monotony, and amount of variation present. Differences between the street scene and either of the two specimen photos for any semantic pair never exceeded one full step on the seven-step scale.

Response to the residential scene devoid of a street tree planting was radically different from the three scenes containing one or more trees. In fact, average responses for this photo reflected what would normally be considered the more

negative concepts present on the differential scales.

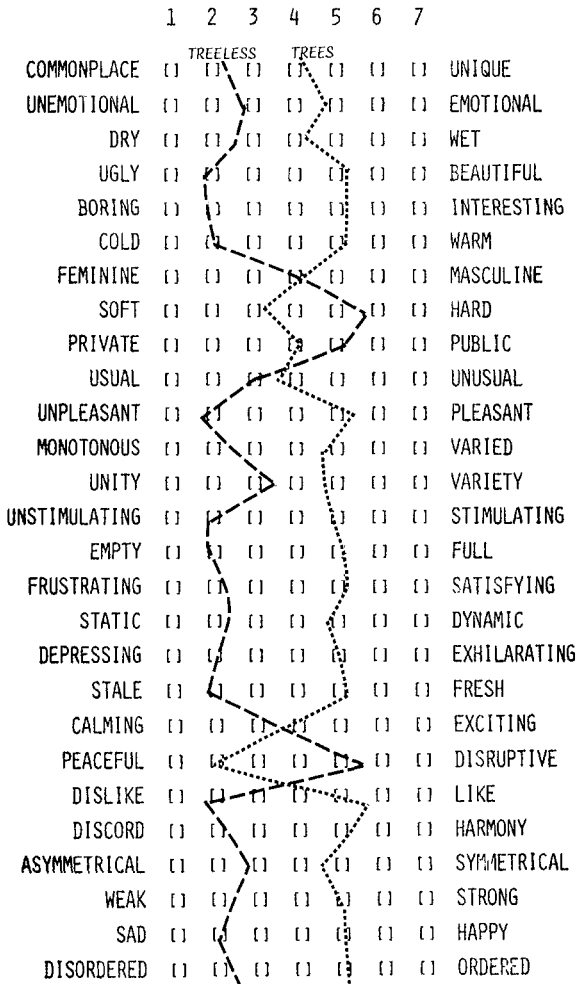


Fig. 1. Composite semantic differential comparisons of photos with and without trees for two Michigan cities — 1978.

Semantic responses obtained from the eight people in East Lansing answering this portion of the survey differed on some points with Midland and Saginaw. However, the overall trend of favoring treed scenes is readily discernable.

The result of the semantic differential analysis strongly suggests that in the minds of residents trees do enhance urban settings.

**Verbal size preferences.** Comparison of responses to existing tree sizes and expressed

verbal preferences (Table 1) suggests that the preference for a change in tree size is four-to-one in favor of larger tree size over a smaller tree size. It appears that people having large trees are verbally more content with their existing tree size than people having small trees as evidenced by 57% of those having large trees indicating a preference for their existing tree size in comparison to 40% of those having small trees and preferring their small trees.

Saginaw was an exception to these trends exhibiting no strong preference for either larger or smaller trees. Verbal preference for smaller trees was indicated 1.4 to 1 over larger trees. For the persons preferring their existing tree size in Saginaw, the small tree group had a 57% preference percentage compared to 49% for the large tree group.

Overall, 50% of those with small trees, indicated a preference for larger trees while only 11% of those having large trees indicated a preference for smaller trees. Once again, the City of Saginaw deviated from the trend, having 24% of the small tree owners preferring trees smaller than they currently had. By way of explanation, it has been suggested that the effects of a 1976 ice storm are still fresh in the minds of many Saginaw citizens who suffered the loss of electrical power, telephone service and in some cases damage to homes and autos when large trees were broken by the ice burden.

**Photo selection choices.** When asked to select appealing street scenes based on street tree size (Table 2), 78% of the respondents selected over 50% large tree scenes opposed to 18% selecting a majority of small tree scenes. By individual sample population, the percentages favoring majorities of large tree photographs ranged from a low of 56% for the small sample in Wheeling to a high of 89% in Midland. Sixty-six percent of the persons who were verbally uncertain as to preferred tree size selected a majority of large tree scenes. People having existing mixed plantings of large and small trees favor large trees 9.5 to 1.

A more detailed analysis of those verbally preferring the "same" size trees is made in Table 2 by subdividing "same" into the existing sizes and then comparing verbal preference with photo

selection preference. This provides opportunity for examination of their photo selection tendencies as well as to see which groups demonstrated the most consistency between verbal and photo selection preferences. The major points of interest include: 1) Of the 49 people verbally preferring existing small trees, 52% selected a majority of large tree scenes. Wheeling, Illinois was the only exception to the trend with no one in this category selecting over 50% large tree scenes. 2) Of those verbally preferring existing small trees, a surprising 33% actually chose

11-14 large tree scenes. 3) Of the 69 verbally preferring existing large trees, 94% selected a majority of large tree scenes. 4) Of the three preferring existing large trees and selecting substantial numbers of small, none selected over 42% small tree scenes.

**Age, education, and sex.** Examined individually, cities demonstrated no significant tendencies in photo selection based on age, education, or sex. Statements relating to these variables will be confined to the five-city average.

No apparent differences concerning tree size

**Table 1. Comparison of existing neighborhood tree size description and verbal size preference for five Midwest Cities<sup>1</sup>—1978**

EXISTING TREE SIZE	VERBAL PREFERENCE				TOTAL #/%
	Same Size	Smaller Trees	Larger Trees	Uncertain	
25' tall or less	48	5	60	7	120/36
Over 25' tall	69	13	28	11	121/36
½-25' tall or less	21	3	31	5	60/18
No street trees	4	10	14	8	36/11
Total #/%	142/42	31/9	133/40	31/9	337

Chi square significance — .0000

<sup>1</sup>Saginaw, Midland, E. Lansing, Michigan and Highland Park and Wheeling, Illinois.

**Table 2. Comparison of preferred tree size by verbal and photo selection techniques in five midwest cities<sup>1</sup>-1978**

VERBAL PREFERENCE	Photo Selection Preference <sup>2</sup>					NUMBER % TOTAL SAMPLE
	Small			Large		
	0-3	4-6	7	8-10	11-14	
Same	8	18	5	22	90	143/42
<i>Existing<sup>3</sup></i>						
<i>Small</i>	8	13	3	9	16	49
<i>Large</i>		3	1	8	57	69
<i>Mixed</i>		1	1	5	14	21
<i>None</i>		1			3	4
Small(er)	16	3	2	5	6	32/9
Large(r)	4	5	4	21	101	135/39
Uncertain	8	1	2	5	17	33/10
TOTAL	36	27	13	53	214	343/100
% OF TOTAL	10%	8%	4%	16%	62%	

<sup>1</sup>Saginaw, Midland and East Lansing, Michigan and Highland Park and Wheeling, Illinois

<sup>2</sup>Number of large tree photos selected of 14 possible: Chi square significance — .0000

<sup>3</sup>"Existing" categories shown as subsets of "Same"

preference exist between female and male respondents. Five-city data showed males selected large trees 80% of the time compared to 76% for females.

Minimal differences exist for education groups when combined into the broad classifications "up through high school" and "more than high school." Persons receiving additional training beyond high school were slightly more likely to select larger trees than persons receiving up to and including a high school education. Selection rates were 83% large for those with "more than high school" education as compared to 63% large for the "up thru high school" group.

The suggestion of a relationship exists between tree size preference and a person's age when respondents are divided into two groups; age 49 years and below and over 50 years. The younger group selected an average of 83% large tree scenes compared to 66% for the fifty and over age group. Perhaps fixed income, impending fixed income, inability to rake a tree lawn, bad experience with large trees, etc. could have an influence on photo selection tendencies for middle-aged and senior citizens. Again, the figures are not significant for any individual city but the overall trend is suggestive.

**Residential planting density preference.** Overall, 59% of interviewees favored more trees in their particular residential street planting (Table 3). Only 2% of the respondents preferred fewer trees, while thirty-seven percent preferred their existing plant density. The relationship between

existing planting density and the number of trees desired is essentially inversely proportional in nature. As might be expected, the desire for more trees is strongest among the groups having no street trees or an occasional street tree, 82% and 92% respectively favoring more trees. People living on streets having approximately one tree for every other home preferred more street trees 80% of the time. Streets averaging one tree per home satisfied 58% of the sampled residents and streets averaging more than one tree per home satisfied 59% of the residents; leaving 40% and 33% of these two groups preferring even more trees.

The inference from Table 3 is that the satisfaction level for a majority of persons is reached with planting densities of approximately one tree per home.

**Survey effect on verbal tree size and density preferences.** Responses to the before and after questions concerning tree size preference and planting density preference registered very little change for the 54 persons sampled. If anything, larger trees were slightly more favored afterwards. Spacing or density responses were virtually identical on both occasions.

**Discussion and Conclusions**

Now to combine survey findings with some thoughts on the practical meaning of these findings for the municipal arborist.

A) Responses to urban scenes with and without the presence of trees have been noted. The

**Table 3. Preference for numbers of trees on street compared by existing numbers for five midwest cities-1978**

EXISTING TREES PER HOME	Preferred Number <sup>1</sup>				#/% Raw Total
	Same	More	Fewer	Uncertain	
None	3/11	22/82	1/4	1/4	27/8
Occasional	1/3	35/92	0/0	2/5	38/11
App One-Half	15/16	75/80	3/3	1/1	94/27
One	70/58	48/40	1/1	1/1	120/35
More than One	38/59	21/33	2/3	3/5	64/19
#/%	127/37	201/59	7/2	8/2	343/100

Chi square significance — .0000

<sup>1</sup>Numbers in cells are number in category and % of row total—i.e. #/%.

message is that trees ameliorate urban surroundings. Perhaps this is something we have always known in less specific terms, but now the question has been confirmed in the field.

- B) In residential situations, people favor large street trees 25 feet tall and over by photo selection in 78% of the cases when only aesthetic considerations are addressed.

#### Qualifications

- (1) Survey respondents were not made aware of any economic implications associated with large trees as opposed to small trees.
- (2) Utilities and other site factors were intentionally omitted from the scope of the survey and consequently responses do not directly reflect these considerations. Professional tree managers should have a strong grasp of local constraints of this nature and should know how to deal with these variables effectively without input from a less qualified source.
- (3) The intent was to find out what people liked so that the tree manager could use that information as an input in the planting decision process. Obviously trees

over 25 feet tall at maturity are not suitable in every situation, but when site factors and economic conditions permit these trees should be considered.

- C) Even persons having small trees and verbally preferring them actually seem to prefer large trees based on their photo selections. Despite the appealing attributes small trees pose for their owners, there is something about a medium sized or large tree that is aesthetically more attractive.
- D) The variables of age, education and sex appear to have minimal influence on tree size preference when based on photo selection. If there is any trend, a young, more educated person prefers large trees more consistently.
- E) A planting density of one tree per home may be a viable rule of thumb for the average residential lot as far as general resident satisfaction is concerned. One tree satisfies a majority, whereas one tree per two homes satisfies only 16% of respondents.

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## ABSTRACTS

Pecknold, P.C. 1978. **Fire blight — its symptoms and control.** *Am. Nurseryman* 148(2): 13, 50.

Fire blight is a bacterial disease that may damage certain ornamental plants, such as flowering crabapple, hawthorn, mountain ash, cotoneaster, pyracantha (firethorn), and spirea. Fire blight is most damaging in years when spring temperatures are above normal, with frequent rains. No single practice can ensure complete control of fire blight. However, the disease can be reduced by a combination of both cultural and chemical control measures.

Spomer, L.A. 1978. **The water relations of transplanted soil.** *Am. Nurseryman* 147(9): 13, 30, 32.

The use of soil containers in nursery crop production is increasing rapidly. Soil in a container is different from that same soil in a ground bed or in the field in two important ways: 1) it is small in volume, and 2) it is shallow in depth. Unfortunately, because these soils are specifically designed for container use, they are often poorly designed for transplanting into field soils or ground bed soils. This article briefly discusses the water relations of container soils transplanted into ground beds — a common nursery practice.