# Understanding Place Through Use of Mixed-Method Approach

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**With the increased application of the activity-based approach comes the inherent need to incorporate more details regarding behavior. This need for detail has, in turn, created the need for a deeper understanding of, and theoretical basis for, behavior; data collection and analysis methods that handle more behavioral detail are also needed. Therefore, the use of qualitative and mixed-method approaches in travel behavior has received increased attention over the past few decades. In this paper, quantitative and qualitative methodologies are discussed and applied to data collected in Santa Barbara, California, to measure peoples' attitudes about their sense of place. Quantitative and qualitative methods are applied, first through a factor analysis and, second, through a qualitative analysis of text from an open-ended question; the results of the two methods are compared. Four factors are derived: the aesthetics and atmosphere, the family- and community-oriented nature of the place, the negative aspects of the place, and the self-benefit of the patronage. The findings of the factor analyses are compared and combined with a text analysis to reach a greater understanding of sense of place and behavior. In addition, unique themes arising from the text analysis are discussed, including parking availability and cost, shopping variety, and the urban environment. Theoretical developments and implications for future research are discussed in light of the analysis findings.**

As the activity-based approach becomes more widely used in travel behavior, researchers have become more reliant on understanding how people make decisions and organize their lives, and how that affects travel. This task requires that human behavior and decision making are represented with as much accuracy and realism as possible. This goal requires that researchers know the aspects that are important to understanding and modeling behavior and measure these aspects and apply them in a meaningful statistical manner. Often, researchers find themselves acknowledging the contribution of the latent, complex, or, at times, seemingly immeasurable dimensions of human agency. Measuring and applying these facets of behavior to models is, at a bare minimum, challenging. As Goulias mentions, travel behavior researchers attempt to understand human behavior and foster positive change (1). To do so, researchers must strive toward behavioral realism to identify key facets of behavior; the research must be done without forcing restrictive analytical methods that may mask the differences that exist.

Researchers have approached these difficulties with differing approaches, which has increased the sophistication of the state of the art in travel behavior. From a purely quantitative perspective, several advancements have been made in statistical modeling that allow for increased flexibility and detail. One notable example, the multiple discrete continuous extreme value models detailed by Bhat, allows for the simultaneous modeling of multiple interdependent decisions and is indicative of the type of advancement that promotes the complex modeling and simulation of decision making (2). In addition, several latent variable models have been primed for travel behavior analysis, including models that tease out random explained variance from the error term—such as random coefficient regression or error component models—or models that incorporate latent attributes, such as latent factor and latent class models. Structural equation modeling has also become a widely used tool, incorporating latent and observed variables and providing a method to analyze the paths between those variables to describe the observed traits. All of these statistical advances allow for the development of models of complex behavior with increased detail regarding the behavioral process, the decisions being made, and those who make the decisions.

Another approach currently being advanced focuses on the type of data collected and the methods by which the data are obtained. Many have acknowledged that to build successful models, the activity-based approach requires a new frame of reference for data needs. The use of qualitative methods and mixed methods has become more prevalent in discussions about the understanding of behavior and the use of nontraditional methods. Discussions, however, have also centered on the necessity of maintaining awareness of the philosophical underpinnings of such methods and proceeding with caution when combining quantitative and qualitative methods. Goulias presents an overview of the research methodologies and strategies that are emerging from different philosophical positions and the suggestions on how to conduct research while staying consistent within a positivist theoretical framework (the predominant travel behavior framework) (1). He goes on to say that "many of the methods under this [qualitative methods] label offer the dynamic flexible tools needed in travel behavior to, on the one hand, extract this 'insider story,' (behavior from the viewpoint of the agent) and, on the other, understand the 'emergence' of behavior and internal cause(s) that are characteristic of complex systems" (1). Similarly, Clifton and Handy state that the more that is understood about people's travel behavior, the more a lack of understanding becomes apparent, and that qualitative methods offer powerful tools to obtain a deeper understanding of the complexity of behavior (3).

From a positivist standpoint, the benefit of qualitative methods in travel behavior is apparent. Clifton and Handy discuss the use of qualitative methods in conjunction with or independently from quantitative methods, and Goulias remarks that, "Some techniques that are often used in qualitative methods can be used within the positivist and probabilistic paradigm as secondary aids of the primary data provision mechanism which is quantitative survey methods" (1).

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Carr likewise states, "Although qualitative techniques do not yield significant results, they are ideally suited for exploratory research such as identifying influential factors of travel behavior" (*4*). Research that attempts to understand decision-making behavior is prime for this combination of methodological approaches because of the limited understanding of the decision process and the insufficiencies in capturing data to explain observed behaviors. The nature of these topics can be both quantitative and qualitative. There are many instances in which qualitative methods, such as ethnographic studies, are not compatible with concurrent quantitative methods, such as questionnaires, because of conflicting theoretical and methodological assumptions (e.g., observation without interference). However, the proper implementation of some qualitative methods can be useful in the positivistic paradigm and can measure more subjective topics. In addition, the theoretical development of these concepts provides a solid foundation from which the details in decision making can be investigated. Sense of place theory, for instance, provides a strong framework for research that attempts to understand the connections between people and places. This theory focuses on the emotional and psychological interactions between a person and the environment. This interaction can occur at different geographic scales and with different intensities. Further discussion of the theoretical framework of sense of place is provided in the following section.

In this paper, a mixed-method approach is used to explore the application of quantitative and qualitative methods in understanding sense of place. The authors have previously explored the quantification of sense of place and its application in behavioral models but have not examined these constructs in comparison to the qualitative data collected (*5, 6*). The use of qualitative methods allows a comparison with the meaning of place extracted by quantitative methods. In addition, the usefulness of the mixed-method approach in research and data collection that involves latent constructs, such as sense of place, will be discussed.

## CONCEPTUAL FRAMEWORK

Discussions about qualitative methods in travel behavior have mostly taken place within the past two decades. Several researchers have discussed possible methodologies that could be used for data collection as well as applications of qualitative analyses in travel behavior (*1, 3, 4, 7, 8*). The application of such methods first requires an understanding of the different strategies for data collection and data analysis that exist within the qualitative and mixed-method approaches.

### Data Collection and Analysis Strategies

To understand behavior and apply that knowledge to models and policies, data must be collected. Tashakkori and Teddlie present four categories of data collection methods used in quantitative and qualitative research: (*a*) asking people for information (e.g., self-reporting, interviews, questionnaires, personality questionnaires, inventories and checklists, attitude scales, and indirect self-reports); (*b*) seeing what people do (i.e., observational methods, such as participant and nonparticipant observation); (*c*) asking people about their relationships with others (sociometry); and (*d*) using data that have been collected or documented by others (archival data and metaanalysis) (*9*).

In addition, Tashakkori and Teddlie present several data analysis strategies used to examine quantitative and qualitative data. Traditional quantitative data analysis methods include descriptive

analysis, inferential, univariate, and multivariate methods. Traditional qualitative methods include simple valence analysis, manifest content analysis, latent content analysis, constant comparative analysis, effects matrices, and developmental research sequence. Mixed-method approaches enable the researcher to utilize both quantitative and qualitative methods in analysis. Tashakkori and Teddlie present three strategies for mixed-method data collection and analysis processes: concurrent mixed analysis, sequential qualitative–quantitative analysis, and sequential quantitative–qualitative analysis; these analysis processes will be discussed in more depth.

### Concurrent Mixed Analysis

Within the concurrent mixed analysis strategy, substrategies are suggested. First, researchers can conduct a concurrent analysis of different data; that is, the researchers can conduct a parallel mixed analysis using both quantitative and qualitative methods on data collected in the same study. Alternatively, concurrent analysis could be conducted on the same data if the researchers have converted quantitative data to qualitative data (e.g., by converting the quantitative data into categories or narratives) or qualitative data to quantitative data (e.g., frequencies of themes or ratings of the strength of themes). For more discussion of the method of conversion see Tashakkori and Teddlie (*9*).

### Sequential Qualitative–Quantitative Analysis

In sequential qualitative–quantitative analysis, the researcher collects data to conduct a qualitative analysis and follows it with a confirmatory quantitative data analysis on the existing data or with quantitative data collection and analysis. In the first stage, qualitative data are used to form groups of people, themes, attributes, or settings or to establish order or causality; this stage is followed by analysis through quantitative methods (e.g., cluster analysis, factor analysis, or structural equation modeling) to further compare or confirm the qualitative findings.

### Sequential Quantitative–Qualitative Analysis

Similarly to the previous example, the two-part quantitative–qualitative method involves, first, a quantitative analysis, which is followed by qualitative data collection or analysis or both. Groups of people (using, for example, cluster analysis), attributes or themes (using factor analysis or multidimensional scaling), or relationships (using path analysis or structural equation modeling) are developed, and a comparison or confirmation of these results is made with qualitative data and analysis techniques, such as constant comparative analysis, observations, or interviews. In this type of analysis, the qualitative data are usually collected to explain the manifestation of the themes or groups observed in the quantitative analysis. These approaches each have advantages and disadvantages. Concurrent analysis allows researchers to gain a better understanding of the variables extracted from analysis and the relationship between them through the use of one data set. Sequential analysis uses a stepwise procedure of an initial analysis to inform the subsequent data collection and analysis. An example of this procedure is the use of focus groups to inform quantitative data collection.

In this paper, a concurrent analysis is conducted with data collected from one time period at two outdoor shopping malls. A quantitative

factor analysis is conducted, followed by a qualitative analysis of an open-ended question, thereby allowing for a comparison of the places and the factors derived by using quantitative methods. Although this analysis follows a concurrent approach, the use of these methods illustrates the power of comparative mixed methods on the same data set, as well as future sequential analysis, when data collection methods for subjective or latent constructs are prepared.

## Sense of Place

The early roots of sense of place were based on a phenomenological perspective, beginning with theorists such as Yi Fu Tuan and Edward Relph. Tuan defines sense of place as a person's "affective ties with the material environment" (10). However, in the 1980s and 1990s, researchers in the positivist traditions within geography, environmental psychology, and economics argued that sense of place could be quantified and applied to research and that it should be explored for valuable information about human behavior (11, 12). Sense of place has since been quantified and applied to topics such as home, neighborhoods, natural areas, and historical places (13–18). Sense of place has been studied in conjunction with the physical attributes of the place, at different geographic scales, and with different applications, including ecosystem management, tourism, and place-based teaching (15, 19–22). Such studies have progressed sense of place research; however, the quantification and application of sense of place is still limited, especially in the case of everyday activities, such as travel behavior modeling and simulation. Traditionally, models that explain travel behavior, such as destination choice, have not included the affective attributes that attract individuals to places. To meld the theory of sense of place and its limited measurement attempts with behavioral modeling in transportation, the structure of sense of place must be further examined. Because of the limited nature of quantitative research into sense of place, a uniform or standard metric of measurement has not been developed.

## DATA DESCRIPTION

To examine sense of place, an intercept-style survey was conducted at two outdoor shopping centers—Paseo Nuevo and La Cumbre, both in Santa Barbara, California—with an interviewer-facilitated paper and pencil survey. A printed questionnaire was given to patrons of each location who were willing to participate; the questionnaire contained questions about sense of place attitudes, travel behavior, and sociodemographics. The sense of place portion of the survey included 34 questions about each location, as well as one open-ended question. A list of the questions is provided below. A more detailed description of the data collection efforts can be found in previous work (23).

- At Paseo Nuevo (or La Cumbre), I am satisfied with
  – Food options.
  – Products offered.
  – Parking.
  – Level of services.
  – Entertainment options.
  – Amount of people.
- Paseo Nuevo (or La Cumbre)
  – Has visually appealing architecture.
  – Has a peaceful and relaxing atmosphere.
  – Is a beautiful mall.
  – Has a good balance of decorative features and businesses.
  – Has artistic value.
  – Has a definite social atmosphere.
  – Is a great, family-friendly place to be.
  – Is a kid-friendly place to be.
  – Has generally friendly people around.
  – Reflects the culture of Santa Barbara.
  – Involves a risk of unpleasant encounters when traveling to it.
  – Is always overcrowded.
  – Has too much going on at it.
  – Makes me afraid to walk around.
  – Makes me feel relaxed.
  – Makes me feel happy.
  – Is one of my favorite places in Santa Barbara.
  – Meets my needs better than any other location in Santa Barbara.
  – Has better diversity in activities that any other place in Santa Barbara.
  – Has stores that lack specific things.
  – Reflects the type of person I am.
  – Makes me feel comfortable because I identify with the atmosphere.
  – Makes me feel too self-conscious.
  – Says very little about me.
  – Makes me feel like I can be myself.
  – Is a good reflection of my identity.
- I would be disappointed if Paseo Nuevo (or La Cumbre) did not exist.
- I only come to Paseo Nuevo (or La Cumbre) when I have specific reasons in mind.
- Please describe the differences that you believe exist between Paseo Nuevo and La Cumbre.

All answers were given on a seven-point Likert scale, except for the final question, which was open-ended. The following statements were reverse coded:

- I would be disappointed if Paseo Nuevo (or La Cumbre) did not exist.
- Paseo Nuevo (or La Cumbre)
  – Has stores that lack specific things.
  – Makes me feel too self-conscious.
  – Says very little about me.
  – Makes me feel like I can be myself.
- I only come to Paseo Nuevo (or La Cumbre) when I have specific reasons in mind.

Patrons were intercepted at one of the two survey sites and asked to complete the questionnaire about each mall. If respondents were unfamiliar with a location (e.g., tourists), those questions were not answered. The sample used in this analysis included only those respondents who answered sense of place questions about each place and completed the open-ended portion of the questionnaire; a sample size of 509 persons was achieved. Sample descriptive statistics can be seen in Table 1.

## ANALYSIS

To analyze sense of place, a mixed-method approach was used. In this way, important aspects that had a positive or negative influence in attracting people to these places could be identified with two

**TABLE 1  Sample Descriptive Statistics**

| Variable | Statistics |
|----------|-----------|
| Gender | 42.8% male |
| Residency | 86.6% Santa Barbara |
| Location surveyed | 28.9% Paseo Nuevo |
| Mode taken to location | 79.2% car, 12.1% walk 2.2% bike, 6.5% other |
| Age | Mean = 37.65 Max. = 88; min. =18 |

NOTE: max. = maximum; min. = minimum.

techniques. A comparison between the two techniques could then be used to confirm the validity of the findings and to identify potentially important aspects for more in-depth scrutiny. Ordered questions were included in a factor analysis, and open-ended answers to the question, "Please describe the differences that you believe exist between Paseo Nuevo and La Cumbre," were analyzed by using qualitative methods of content analysis. Previous work presents the descriptive statistics of each of the questions included in the survey, as well as a more in-depth analysis of several of the questions (23).

## Factor Analysis

To understand the latent factors that existed in the data, an exploratory factor analysis was conducted using the scores of the respondents for the location of patronage. A full explanation of the exploratory

factor analysis conducted can be found in Deutsch et al. (24). The initial analysis involved all 34 questions; this number was reduced to 19 questions that loaded into four salient factors. The four factors extracted through the exploratory factor analysis were the aesthetics and atmosphere, the family- and community-oriented nature of the place, the negative aspects of the place, and the self-benefit of the patronage. This four-factor structure was then imposed on two confirmatory factor analyses of each place, with all patrons of both Paseo Nuevo and La Cumbre included in the analysis, regardless of place surveyed. The goodness-of-fit statistics in Figures 1 and 2 show that both are well-fitting models.

The results of the two confirmatory factor analysis models can be seen in Figure 1 (Paseo Nuevo) and Figure 2 (La Cumbre). The resulting factor loadings of the two analyses indicate some similarities and differences between the places in the composition of factors and their contribution to explaining the observed attitudes. For instance, the loadings within the community-oriented factor indicate that the contribution of the factor to the statement "Paseo Nuevo (or La Cumbre) is a family-friendly place to be" is much stronger in the Paseo Nuevo factor analysis. Similarly, the factor that highlights aesthetics and atmosphere contains some notable differences. For instance, the statement regarding the architecture of the places ("[location] has visually appealing architecture") has a lower factor loading for Paseo Nuevo than for La Cumbre. The statement elicits very different responses at each location (the mean response at Paseo Nuevo is 6.01, with a standard deviation of 0.922; the mean response at La Cumbre is 4.70, with a standard deviation of 1.581). The responses to the statement, as indicated by the descriptive statistics, were stronger in the positive direction for Paseo Nuevo, with less variation among the responses. Therefore, this statement could not contribute as much in describing the observed differences. This
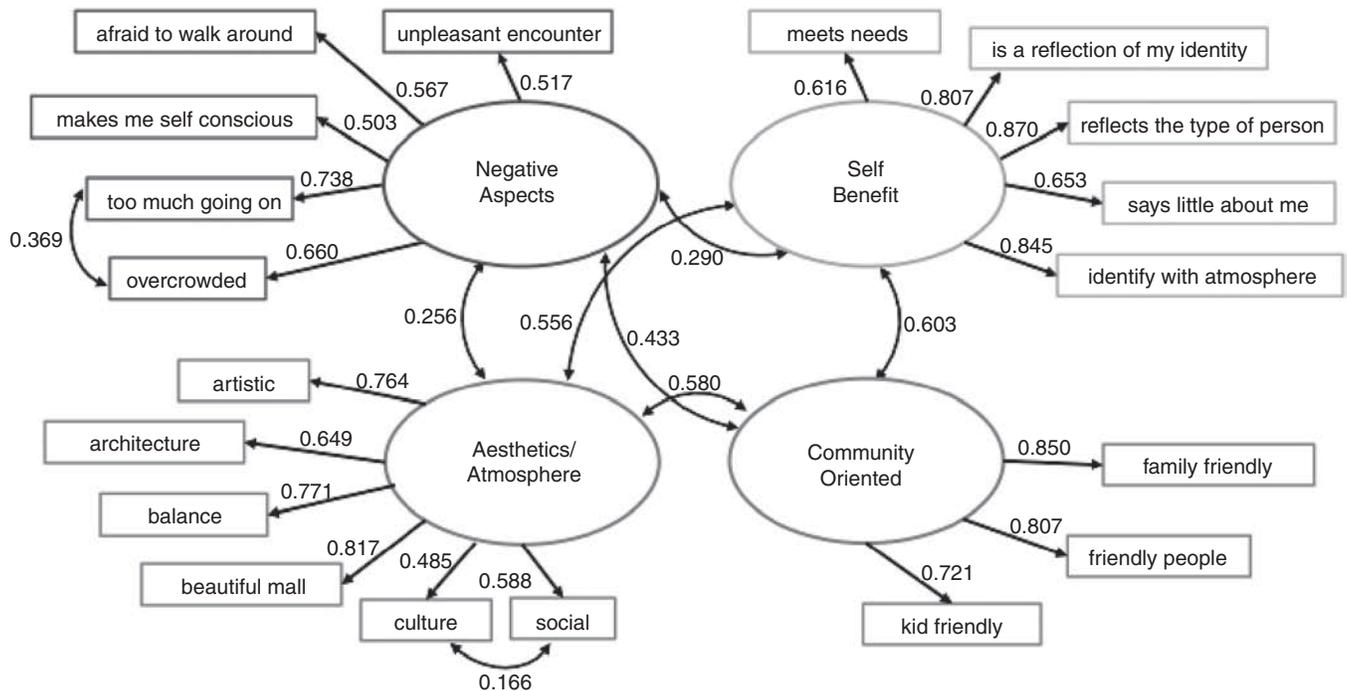


FIGURE 1  Paseo Nuevo factor structure [all paths $p < .001$. $\chi^2$ (144 degrees of freedom) = 422.142; $p < .001$; RMSEA = root mean square error of approximation = 0.06; CFI = comparative fit index = 93; SRMR = standardized root mean square residual = 0.05].
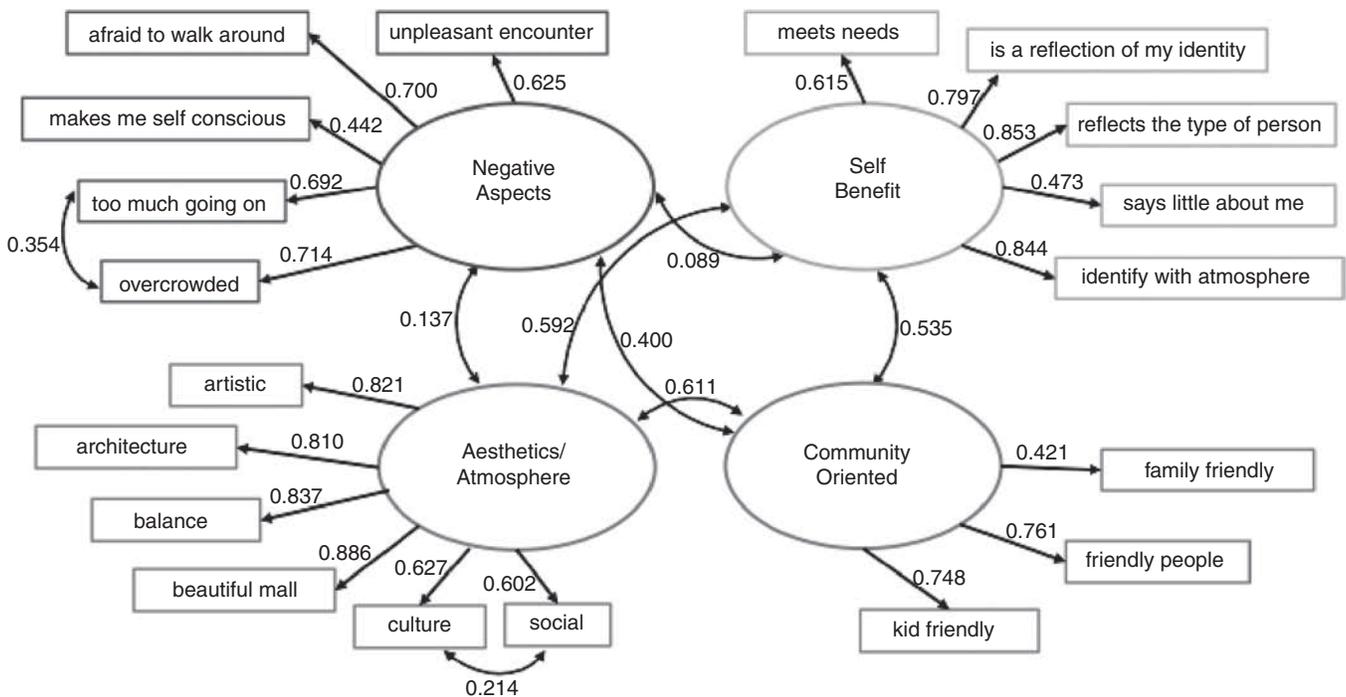
FIGURE 2   La Cumbre factor structure [all paths $p$ < .001. $\chi^2$ (144 degrees of freedom) = 406.420; RMSEA = 0.06; SRMR = 0.06].

finding is the opposite for the statement "[location] says little about me," for which more of the observed data was explained by the latent factor in the case of Paseo Nuevo than for La Cumbre.

In addition to the analysis of the factor structure for each location, the factor scores were obtained for each individual respondent. Although the mean score for all respondents should be equal to zero because of standardization during the factor analytic procedures, an analysis of the respondents was conducted on the basis of survey location. Figure 3 provides the factor means and standard deviations for each of the factors by respondent group. An analysis of the means and standard deviations of each group of respondents (those surveyed at Paseo Nuevo and those surveyed at La Cumbre) indicated that there were notable differences among the four groups of patrons and places. First, those at Paseo Nuevo had a positive mean for all Paseo Nuevo factor scores and a negative mean for all La Cumbre scores. Conversely, those at La Cumbre had a negative mean for all Paseo Nuevo factors and a positive mean for all La Cumbre factors. In addition, the distance between the averages of the La Cumbre factors is much greater than for those of the Paseo Nuevo factors. This finding shows that patrons at La Cumbre had lower negative factor scores (and therefore attitudes) about Paseo Nuevo than their counterparts at Paseo Nuevo had regarding La Cumbre (i.e., there was a lack of symmetry in attitudes and behavior). In both cases, people had higher factor averages for the shopping center that they were visiting. This finding can be viewed as either (*a*) the justification for their revealed choice or (*b*) the attraction of the place and, therefore, the reason they chose to visit the place. That is to say, it is unknown whether the responses were conditioned by the fact that the respondents were surveyed at a specific mall. Determination of this issue would require further investigation that is outside the scope of this paper. The standard deviations of each factor indicate that the greatest variation is present in the factor scores for the

La Cumbre atmosphere and aesthetics, La Cumbre self-benefit, Paseo Nuevo community, and Paseo Nuevo self-benefit factors.

### Qualitative Analysis

Although factor analysis is a rich technique and contributes to measurement of sense of place theory and the attitudes regarding specific locations, an additional qualitative analysis was conducted. Responses to the open-ended instruction, "Please describe the differences that you believe exist between Paseo Nuevo and La Cumbre," were divided into content that described Paseo Nuevo and content that described La Cumbre. The responses for each were then analyzed with Wordle, a tool for semantic frequency analysis. This analysis determined whether common themes existed in the open-ended responses that could be compared and contrasted with the outcome of the factor analysis. The analysis employs a Boolean technique, which, after common words (e.g., is, and, that) are eliminated, provides the frequency of occurrence. There are other techniques in the field of information retrieval for latent semantic analysis and indexing and web crawler techniques that have the potential to add value to text analysis that could be used in future analyses (*25–27*). The results can be seen in Figure 4 (Paseo Nuevo) and Figure 5 (La Cumbre); frequencies for the most common 20 words are given in Table 2. This analytical method provided several important comparisons that contributed to the overall understanding of important aspects of sense of place. For instance, parking was discussed in the comments about both locations (Paseo Nuevo 41 times; La Cumbre 53 times). However, the context of the word was quite different for each location. To further analyze the nature of some words, each instance of the word was recorded as being positive, negative, or neutral in tone. One out of 53 comments about parking at La Cumbre was negative, and one

FIGURE 3   Factor means and standard deviations.

discussed a parking lot and had a neutral tone. The remaining 51 comments were positive toward the parking at La Cumbre; at La Cumbre, open-air surface lots surround the shopping center. Comments about parking with respect to Paseo Nuevo, however, were largely the opposite: 30 out of 41 comments focused on the negative aspects of parking (i.e., not enough, payment required, inconvenience, and general dislike). Paseo Nuevo parking is mostly structured parking, with very limited on-street parking. Parking is free for the first 75 min, but a rate of $1.50 per hour is applied thereafter.

Similar analysis was conducted on the other most frequently used words. Many comments also discussed the stores at each location. The word "stores" appeared 42 times in text about Paseo Nuevo (with 37 of those comments being positive, and five being neutral), and 62 times in text about La Cumbre (with 20 positive comments, 36 negative, and six neutral). Many of the comments regarding stores at each place consisted of satisfaction with the stores and the diversity offered, or dissatisfaction with the diversity, cost, high-end nature, and products (mostly at La Cumbre). Additionally, the



FIGURE 4   Paseo Nuevo content analysis.

TABLE 2  Most Common Words and Frequencies

| La Cumbre | Count | Paseo Nuevo | Count |
|-----------|-------|-------------|-------|
| Stores | 62 | Crowded | 48 |
| Shopping | 30 | Downtown | 48 |
| Shop | 21 | Stores | 42 |
| Seems | 16 | Parking | 41 |
| Quiet | 24 | Better | 40 |
| Place | 25 | People | 39 |
| People | 30 | Tourists | 28 |
| Parking | 53 | Shopping | 28 |
| Much | 21 | Much | 26 |
| Mall | 40 | Go | 25 |
| Locals | 17 | Like | 22 |
| Like | 35 | Location | 20 |
| Less | 43 | State | 20 |
| Good | 18 | Atmosphere | 18 |
| Friendly | 15 | Mall | 18 |
| Easier | 18 | Around | 17 |
| Crowded | 20 | Restaurants | 16 |
| Come | 16 | Street | 15 |
| Better | 36 | Upscale | 15 |
| Atmosphere | 18 | Options | 15 |

great accessibility, and a positive atmosphere. However, comments regarding the crowded nature of the Paseo Nuevo area were mostly negative, with a few people commenting that they liked the location for people watching or other activities. Many comments also centered on the touristy nature of Paseo Nuevo ("tourist" or "tourists" appearing 47 times and "touristy" appearing 11 times), given its downtown location. La Cumbre, conversely, had many comments about it looking like a typical suburban mall. Many of these comments continued to describe this design as boring, drab, unexciting, or depressing. This initial analysis of the open-ended comments indicates that different sentiments are apparent and provides grounds for wider data collection and more sophisticated qualitative analysis tools. Because of the pilot nature of the qualitative portion of this analysis, no intercoder reliability tests were conducted, but they would certainly be necessary for more sophisticated and in-depth analysis.

## DISCUSSION OF ANALYSES

Through the use of factor analytic techniques, differences between places and the people at those places are evident. Factor analysis provides a strong technique for the analysis of data and the extraction of latent themes or factors that can be used to explain the occurrence of the observed data. However, there are limitations in the ability of factor analysis to capture the complete story. These limitations might be the result of insufficient questions, poorly worded or designed questions, or a lack of theory or previous examples being used to capture the processes of interest. The use of qualitative methods can help to inform researchers to tell a more complete story or design more complete data collection methods. In this research, several themes were apparent in the qualitative analysis that had not become manifest through quantitative methods. Parking, for instance, was discussed at large in text about both locations, one

themes of downtown (appearing 48 times, of which 39 were positive toned) and crowded (appearing 48 times, of which six were positive, 25 were negative, and 17 were neutral or had an indiscernible tone) appeared in analysis of the text about Paseo Nuevo. Many comments framed the downtown location of Paseo Nuevo in a positive light, noting that it was lively, active, had diverse options,



FIGURE 5  La Cumbre content analysis.

with a more positive tone (La Cumbre) and the other with a more negative tone (Paseo Nuevo). A quantitative question regarding satisfaction with parking was included in the original exploratory factor analysis and did not load into a salient factor. Given the combination of analysis methods, perhaps the lack of presence of the parking question was attributable to the unique nature of parking; that is to say it would potentially need a factor of its own. Within the confines of factor analytic methods, a factor that contains a single indicator would not be retained, thus eliminating this attribute from the analysis. Another theme that emerged from the qualitative analysis was focused on the stores and products offered at the location. This topic was also included through several measured statements, including, "I am satisfied with the products offered," "Paseo Nuevo (or La Cumbre) lacks certain things," and "Paseo Nuevo (or La Cumbre) meets my needs better than any other location in Santa Barbara," of which only one statement (the latter) loaded onto a factor. Many themes that emerged from the qualitative analysis also mirrored the factors that were found here. For instance, "atmosphere" and "people" were common elements in the text from La Cumbre, whereas "crowded," "downtown," "tourist," and "people" were all elements of text on Paseo Nuevo, which similarly can be found in the overall composition of the factor structure.

## CONCLUSIONS

Understanding the detail and complexity of human behavior is an endeavor that transportation researchers should examine more closely. Although the quantitative tools used in modeling are well developed and have become increasingly flexible, the additional detail that fails to be sufficiently captured and explained must be considered, otherwise there is a risk that preferences and choices will be misunderstood. For this reason, the incorporation of qualitative methods of data collection and analysis should be considered and applied. The findings of the research presented in this paper make a strong case for the use of a mixed-method approach to understand behavior. Place attitudes, incorporated into the theoretical framework of sense of place, provide a well-developed foundation for this type of analysis. On the basis of theory developments, a survey was developed that incorporated ordered, closed-ended, and open-ended questions. An analysis of these questions through quantitative and qualitative methods produced an interesting comparison of findings. This process is one kind of triangulation that can be created to identify common themes emerging from two (or more) analysis methods.

The results of the qualitative analysis identified several aspects of the places that were not significant in the factor structure. In this paper, a concurrent analysis was described. The use of concurrent analysis methods can provide further knowledge of place and make contributions to the development of measurement tools for further quantification. Additionally, further analysis of these qualitative themes could be conducted that would allow for some level of quantification. For instance, the physical attributes of place (such as parking availability and costs by time of day) could be used to compare places and capture some of the differences that cause the disparity in sentiment. Similarly, attributes such as the type and cost of products, the volume of vehicle and foot traffic, the ambient noise level, or the accessibility to types of activity could capture additional differences between places in a quantifiable manner to describe the existence of these themes. Although the differences between places were perhaps exaggerated because of

the specific open-ended instruction, "Please describe the differences that you believe exist between Paseo Nuevo and La Cumbre," the similarities between locations were also captured. The similarity of important overarching themes at each place was evidenced by the goodness-of-fit indices by using the identical imposed factor structure. If the two places were radically different with regard to important themes or factors, the model fit would likely have been poor after a set structure was imposed. The existence of these similarities and differences relates to the geographic scaling of sense of place, in that at one aggregation, the shopping centers elicit certain similarities and differences in sense-of-place attributes compared with different activity locations, but specific points in space elicit another set of similarities and differences. The findings presented in this paper have also been used to design a tracking survey using Global Positioning Systems that allows more in-depth data to be gained from participants. A text-mining method is also being developed that allows for a systematic classification of reports.

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