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Do Smart-Growth Environments Benefit Single Mothers? Evidence from Thirty MSAs Using the American Housing Survey Data

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Abstract

This paper examines the relationship of smart-growth environments at the local and regional levels to neighborhood satisfaction for single mothers and parents in two-parent families. It employs mixed-models using an extensive data set with micro-level data for respondents from thirty U.S. metropolitan areas. Findings indicated differential impacts of smart-growth measures on satisfaction, with some having positive effects and others having negative effects. When differences occurred, the impact of smart-growth environmental measures (positive or negative) was stronger for single mothers. Much of the difference in satisfaction between single mothers and other parents can be explained by differences in housing quality.

Keywords

smart growth environments, compact and mixed use, neighborhood satisfaction, single-mother-headed household

Introduction

The past two U.S. Censuses have revealed a sharp rise in the numbers of nontraditional families. Single-parent-headed families, about 80 percent of which are headed by women, witnessed an 18 percent increase (Lofquist et al. 2012). The single mothers are often poor. The recent 2010 census showed that single mothers' median annual income was only one third the median income of two-parent families; their poverty rate was three times that of the general population. More than half of the single mothers were raising multiple children and more than two thirds of them worked outside their homes (The Women's Legal Defense and Education Fund 2012). Planning literature suggests that single mothers are more environment-dependent than other family groups (Spain 1990). For planners concerned with creating urban environments that promote quality of life and social equity, this group deserves close attention.

Writings by material feminists have long pointed out that housing and neighborhood environments play an important role in affecting quality of life for women in general and single mothers in particular (Hayden 1983). Their call for residential environments that offer good accessibility to services and employment appears to resonate well with the principles and prescriptions for guiding urban development currently promoted by proponents of smart growth and the New Urbanism in the US (Markovich and Hendler 2006). Single mothers' need to fulfill two roles as caretaker and income-earner has made them highly dependent on the close proximity of their neighborhoods as a place for employment opportunities, access to services, social relationships, and social acceptance (Edin and Lein 1997; Lleras 2008; Robbins and McFadden 2003; van Vliet 1985; Wekerle 1985). Thus they appear to be the kind of household that could benefit from living in more compact and mixed-use neighborhoods, the so-called "smart growth" neighborhoods.

But it remains unclear if "smart growth" environments can enhance single-mother households' quality of life and elevate their disadvantaged status. These doubts exist for two reasons. One possibility focuses on the impact of smart-growth environments at the neighborhood level. This reasoning suggests that, for many single mothers, the high density and mixed-use neighborhoods that they can afford often possess problems that potentially outweigh the convenience and accessibility benefits that these neighborhoods can offer (Cook 1988). Another possibility, pertaining to the impact of smart-growth environments at the regional or metropolitan

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area scale, is that, as urban forms become more compact, regions tend to witness more serious housing affordability problems for economically vulnerable groups (Burton 2000, 2003; Kahn 2001). Given their lower incomes and higher levels of poverty, single mothers in these regions could be less likely to obtain quality housing and, as a result, experience even more and worse neighborhood problems.

While these two lines of reasoning focus on different levels of smart growth planning (neighborhood vs. metro), they both highlight the complex ways in which the characteristics of smart growth environments may influence the choice and quality of neighborhoods that are accessible to groups such as single mothers. There is little research in the planning field that has examined the physical form characteristics of single mothers' residential environment and the potential association of these characteristics with their quality of life. More importantly, little empirical evidence exists for the notion that single mothers would benefit more from smart growth environments, compared with other population groups, a notion often implied with claims regarding smart growth's contribution to social equity.

In this article, we examine empirical evidence regarding the relationships of smart-growth environments at both the local and regional levels with quality of life for single mothers. In order to investigate the social-equity impacts of smart growth environments, we examine the discrepancy in quality of life between single mothers and adults in traditional child-raising families (i.e., two-parent families) in relation to smart growth environment characteristics. We hope to extend current planning literature in several ways. First, we bring attention to differences in the neighborhood experiences of single mothers and groups of more advantaged status, an area that has previously been understudied. Second, we link the literature investigating the relationship of smart growth environments to neighborhood perceptions, using indicators of environmental characteristics measured at both regional and local (neighborhood) scales. Third, we use a very large sample of respondents, from 30 different metropolitan areas, and employ robust statistical techniques to examine our hypotheses and control for possible confounding factors. Much of the planning and feminist literature can be interpreted as suggesting that compact and mixed-use neighborhoods and regions are more supportive for single mothers (see Markovich and Hendler 2006). Our work provides an empirical test of that assumption.

Related Literature

Our analysis builds on two generally distinct strands of literature, both of which are described below. The first involves smart growth environments and the ways in which they are, or are not, related to residents' quality of life and social equity. The second involves the built environment characteristics that are considered important to support women's, and especially single mothers', quality of life. We end this section by presenting the research questions that guided our analysis.

Smart Growth Environment and Its Impacts on Quality of Life

Following Ewing et al. (2007), we define smart growth environments as urban forms that exhibit the "compact and mixed-use" physical characteristics.[1] These characteristics can be found across multiple spatial scales. A smart growth region has urban growth that is contained to curb sprawl while revitalizing its inner cities. A smart growth community emphasizes densification and mixed-use development that involves infill and brown-field development at its urban core or town center. A smart growth neighborhood displays physical features that help create a place that is pedestrian-friendly, supports good access to services and employment, enables a functioning/practical public transportation system, and encourages social interactions between diverse population groups. While not identical to New Urbanism, smart growth aligns itself closely with New Urbanism in the use of "traditional" neighborhood design to achieve street connectivity and a mixture of land uses and housing type (Duany, Plater-Zyberk, and Speck 2000; Rast 2006).

The planning literature contains a wide range of research about the possible contribution of smart growth environments to achieving economic, environmental and social sustainability. A smart-growth environment, particularly at a regional scale, saves land, protects open space, and likely allows greater efficiency in public infrastructure investment (Burchell et al. 2005; Litman 2006). When achieved at a local, neighborhood scale, smart growth environments presumably improve urban residents' quality of life by offering them better accessibility for services, greater chances for physical activities such as walking and social interactions, a greater sense of community, and even greater "happiness" (Duany, Plater-Zyberk, and Speck 2000; New Urbanism, n.d.).

Empirical research addressing quality of life includes a wide range of studies. Some examine the association of urban form characteristics with conditions such as access to facilities and services (Dempsey et al. 2010; Jenks, Burton, and Williams 1996), behavioral patterns of travel, physical activities, socialization (Ewing et al. 2007; Forsyth et al. 2008; Krizek 2003; Lund 2003), and health outcomes (Frank, Engelke, and Schmid 2003; Kelly-Schwartz et al. 2004). Other studies assess the relationship of urban form to social psychological conditions such as sense of community (Brown and Cropper 2001; Kim and Kaplan 2004; Nasar 2003), social capital (Nguyen 2010), and residential satisfaction (Bramley and Power 2009; Lovejoy, Handy, and Mokhtarian 2010; Nelson, Sanchez, and Dawkins 2007; Yang 2008).

It is beyond the scope of this article to provide an adequate review of the literature regarding the impacts of smart growth characteristics on various aspects of behavioral or psychological outcomes relevant to quality of life. Instead of focusing on the specific results and findings from the empirical studies, we provide a broad overview and discuss three main concerns in the current research. We then use this discussion as a foundation for the analysis presented in this paper.

First, research has generally addressed the effects of compact and mixed-use form on an outcome in quantitative terms while paying inadequate attention to the qualitative, or subjective, aspect of the outcome. Thus, studies have often failed to acknowledge that similar quantities can be perceived and/or experienced in qualitatively different ways depending on the context where the outcome is examined and on the people involved. For example, there may be less driving in higher density places, but the driving may be done in more congested conditions; there may be more walking in those places, but the walking may be performed in a place with worse air and noise pollution (Schweitzer and Zhou 2010). In other words, compact and mixed-use environments provide their residents greater opportunities to access places and more chances to interact with people, but it remains unclear whether these changes are associated with better quality and higher levels of satisfaction. This uncertainty can be especially relevant for low-income populations.

Second, much of the research has tended to focus on the presumed advantages or positive outcomes that smart-growth environments can bring. Inadequate attention has been paid to the potential costs or the association of smart growth characteristics with a variety of negative environmental qualities such as more air pollution, greater congestion, etc. In part, this tendency reflects the indiscriminant acceptance of "urbanity" of smart growth and New Urbanism, which corresponds to the revived optimism toward urbanism as suggested by a wide range of popular writings and academic monologues, especially in North America (see a summary provided in Gleeson 2012).

Third, studies have typically assumed uniformity in the quality-of-life effects from smart-growth environments across different spatial scales and among different population groups. Implied in most of these studies is the belief that costs and benefits delivered by smart-growth environments are equally distributed among all residents. In other words, the social equity achievement of smart growth development is taken for granted. Furthermore, proponents of smart growth and New Urbanism frequently state that the smart growth environments are particularly beneficial to disadvantaged groups such as low-income households, older residents, and women (New Urbanism, n.d.). Thus, it is assumed that smart growth characteristics can help reduce the gap in the quality of life between the worse-off groups and better-off ones.

However, evidence from the few studies that investigate the effects of smart-growth characteristics on social equity could be described as less than convincing. For instance, Burton's (2000, 2003) correlational analysis of data regarding cities in the United Kingdom found that "compactness" had negative impacts on domestic living space, affordable housing, crime levels, and walking, with stronger negative impacts for low-income households. Her findings also showed positive effects of compactness on three aspects, especially for low-income households—improved public transportation use, reduced social segregation, and better access to facilities.

Kahn (2001) studied the discrepancy in housing consumption between blacks and whites in relation to the level of sprawl of a region in the U.S. context. His study revealed that in a more compact (or less sprawling) region, black populations experience a more disadvantaged status in several aspects of housing consumption, including unit size and home ownership. Kahn speculated that sprawl "increases housing affordability, which may contribute to reducing the black/white housing consumption gap" (Kahn 2001, 77). A study by Dawkins (2009) also suggests that sprawled cities provide more options for housing consumers and appears to accelerate the transition to first-time homeownership, especially for low-income households.

While these studies did not look at subjective experiences of individuals and the impact of environments on these individuals, a recent qualitative analysis provides additional evidence of ways in which smart growth areas may not always benefit residents. Pfeiffer's (2012) analysis of the Los Angeles area reveals that inequality between blacks and whites in neighborhood conditions is much smaller in low-density, exurban places than in inner-city Los Angeles or its nearby suburbs, where smart growth characteristics are stronger.

In short, while an extensive literature touts the benefits of smart-growth environments, much less work has examined the possible differential impacts of smart growth on various population groups, especially for the disadvantaged. Studies that have appeared have generally paid little attention to residents' subjective well-being or satisfaction and have often focused on smart growth characteristics at a single spatial scale (e.g., neighborhood or region).

Our study addresses gaps in this literature by examining the relationship of smart growth characteristics to residents' quality of life in terms of their subjective well-being, specifically their reported satisfaction with their neighborhood of residence. We approach the equity effects of smart growth environment on quality of life by focusing on how the relationship of urban form characteristics to neighborhood satisfaction differs between single mothers, an often marginalized social group, and other better-off groups. In the next section, we examine literature more directly related to the residential environments of single mothers.

Single Mothers' Residential Environments and Satisfaction

The disadvantages that single mothers experience cut across several dimensions underlying the inequality in housing opportunities and outcomes—gender, marital status/family structure, income, and sometimes race (Bruin and Cook 1997; Downey 2005; Downey and Hawkins 2008). These disadvantages together make single mothers undoubtedly the most vulnerable group in the housing market. The study of what kinds of environments work best for single mothers and how and why they are beneficial requires understanding single mothers' housing and residential needs, the challenges they face in housing decisions, and the compromises and trade-offs they have to make that ultimately determine their residential well-being.

"Material feminists" have long recognized that the spatial dimension of material conditions has important implications for women's lives. Certain spatial solutions rested in housing design and neighborhood organization can liberate women from household burdens and help them advance their personal development (Hayden 1983). An ideal way of organizing women and family life envisioned by the material feminists involves dense urban neighborhoods equipped with facilities for socializing domestic work, such as neighborhood kitchens, laundries, and child care centers. In the absence of the collective options, neighborhoods that serve as a locus for commercial provision of services and facilities can help provide support for women with multiple roles and special needs (van Vliet 1985). In other words, the profile of a women-supporting neighborhood features accessible commercial services, employment opportunities nearby, good public transportation, and diverse housing options (Wekerle 1985). This could, to many, sound like the description of neighborhoods containing a mixture of uses, one of the key elements of smart-growth environments. It could suggest that single mothers would be especially likely to be satisfied with their neighborhoods when they had these characteristics (Markovich and Hendler 2006).

Despite the favorable theoretic postulation about how urban, smart-growth environments might benefit single mothers, empirical studies have failed to show that urban living is more satisfying for single mothers. The complexities involved reflect the issues discussed earlier regarding empirical studies on smart growth environments. Specifically, they involve issues related to the variation in environmental qualities of smart growth neighborhoods, the degree to which smart growth environments can fulfill particular residential needs, and the ways in which smart growth environments may both positively and negatively affect quality of life.

First, in a context where consumption of environmental quality is determined via a market-based mechanism, economically disadvantaged groups are likely to experience environments of lower-end qualities regardless of the physical form of their residential environment (Schweitzer and Max 2007). Studies have shown that single mothers are disproportionately present in areas characterized by heavy pollution, poor maintenance, and high levels of social problems, such as poverty and compromised safety (Downey 2005; Downey and Hawkins 2008; South and Crowder 1998). These undesirable conditions have a greater presence and are of stronger magnitude in places with smart growth environment characteristics (Boyko and Cooper 2011; Bramley et al. 2009). And these conditions are of greater salience to single mothers and can outweigh the benefits afforded to them in the form of urban convenience. A study by Cook (1988) of two comparable groups of single mothers residing in urban and suburban locations revealed that single mothers in suburban neighborhoods reported higher overall neighborhood satisfaction. Safety and quietness of the neighborhood, two qualities harder to achieve in an urban setting, were found to be the most significant predictors of neighborhood satisfaction for both groups. These factors were more important than other issues such as the accessibility, social interaction, and neighborhood attachment supposedly fostered by mixed neighborhoods.

Second, not all components associated with smart growth environments work equally well for this group. The prescription of having mixed use across all spatial scales spelled out in the New Urbanism Charter (Leccess and McCormick 2000) might be especially problematic for families with children. Existing literature has suggested that families' desires to raise their children in a safe and healthy environment can be an important factor that deters them from accepting mixture of land uses at a fine spatial scale (Markovich and Hendler 2006; Howley 2009). Not surprisingly, in her study of single mothers in two settings that was described above, Cook found that suburban single mothers were more likely than their urban counterparts to feel that their neighborhoods were a good place to raise children (Cook 1988).

Finally the differential effects of smart-growth environments by spatial scales and by population groups may be especially salient for single mothers. It is unclear whether the impact of smart growth characteristics at a regional level mirrors the impact that occurs at a neighborhood level. For instance, to the extent that smart growth neighborhoods afford better accessibility to various services, they may be especially likely to meet the needs of single mothers with limited time and resources, thus enhancing single mothers' satisfaction with their neighborhoods. However, to the extent that smart growth regions of greater compactness have higher housing costs, they may be less advantageous for single mothers. Given single mothers' lower incomes and also, perhaps, discrimination, more compact regions may force them into more problematic neighborhood settings and thus lead to lower levels of neighborhood satisfaction.

Clearly, the relationship of smart-growth environments to residents' quality of life is not simple. Past research has used residential satisfaction as a measure of people's quality of life to investigate smart growth environments' impacts on

the general population (see Nelson, Sanchez, and Dawkins 2007; Yang 2008). Little research, however, has specifically examined single mothers' residential satisfaction in relation to their neighborhoods' smart-growth environment characteristics.

Research Questions

We examine the relationship of smart growth environments to residents' quality of life by answering the following research questions:

1. How do the residential environments and experiences of single mothers differ from two parent families? We limit our comparison to parents with children to control for the variety of other life-cycle factors that may be related to housing needs and satisfaction.
2. Do smart growth characteristics contribute to respondents' satisfaction with their neighborhoods, and do these characteristics help reduce the gap in satisfaction between single mothers and parents in two-parent families? We investigate the associations of neighborhood satisfaction with characteristics of smart growth exhibited at both neighborhood and regional scales. We are particularly interested in the extent to which smart growth characteristics may affect the satisfaction gap between single mothers and two-parent households by having differential effects on neighborhood satisfaction for these two groups.[2]
3. To what extent is the relationship of smart-growth environments to neighborhood satisfaction mediated by quality of housing and the neighborhood environment that respondents can obtain and their sociodemographic characteristics? Based on the literature reviewed above, we expected that a substantial proportion of the difference in neighborhood satisfaction expressed by single mothers and those in two-parent families, as well as the impact of smart-growth environments on these differences, would be explained by differences in the quality of their neighborhood environments and housing units. As noted above, some of the feminist arguments would suggest that, if housing and environmental quality levels were similar, single mothers would express higher levels of satisfaction than respondents from two-parent households when in smart growth environments.

Research Design and Methodology

We use neighborhood satisfaction to investigate the way in which smart growth environments benefit, or do not benefit, single mothers. Our research design draws from existing literature to define and measure neighborhood satisfaction, as well as to examine the effects of smart growth characteristics on satisfaction independent of other important factors (see Francescato 2002).[3]

Studies focusing on single mothers' neighborhood satisfaction have been relatively scarce. Most have been based on small samples in one location and have only reported descriptive results. Given the possibility that these results are highly dependent on the characteristics of the people in the sample and the particular region that was studied, Wekerle (1985) stressed the importance of examining larger samples, in different locations, and using more systematic and sophisticated analysis techniques. Our analysis begins to fill this gap by using mixed model regressions to examine data gathered in the first decade of the century from more than thirty-two thousand people in thirty different metropolitan areas.

Our analysis addresses the three research questions outlined above. Our first research question regarding differences in neighborhood satisfaction of single-mother and two-parent families is addressed by Models 1 and 2, as well as simple descriptive analyses. We then test the second research question regarding the extent to which smart growth at both the regional and neighborhood scale is related to satisfaction and the extent to which these factors can explain the gap between single-mother and two-parent families (Models 3, 4, and 5). Finally, we examine the third research question regarding the extent to which gaps in satisfaction can be explained by differences between single-mother and two-parent families in the quality of their housing and their sociodemographic characteristics (Model 6).

Sample and Data

We use microdata regarding single-mother and two-parent families with children from the American Housing Survey (AHS) collected in 2002, 2004, and 2007. The AHS is the only national survey that provides information about characteristics of housing, neighborhoods, and households, as well as residents' evaluations of their housing units and neighborhoods. Several previous studies on single mothers' housing conditions have used the AHS data (see Spain 1990; Cook 1989). More recently, AHS data have been used to examine the relationship between urban containment policies and perceived neighborhood quality (see Nelson, Sanchez, and Dawkins 2007) and the relationship between urban form and people's quality of life (Yang 2008).

As explained earlier, we purposely limited the sample to two-parent households with children to control for the wide range of factors that affect families' well-being throughout the life cycle.[4] This resulted in a more parsimonious test of our research questions. The conclusions presented below regarding the experiences of single mothers were not altered when other families with children were included (e.g., single fathers, grandparents, etc.; about 8 percent of all families with children). Results with their inclusion are available from the authors upon request.

Table 1. Metropolitan Areas in the Analysis, Sample Size, Year of Data, and Mixed and Density Scores.

	Variables Imported from Ewing, Pendall, and Chen (2002)		Data from the AHS	
Metropolitan Areas Included	Mixed-Use Score	Density Score	Year	*N*
Anaheim—Santa Ana, CA	121.5	128.8	2002	1,422
Atlanta, GA	73.7	84.5	2004	1,288
Baltimore, MD	106.8	104.3	2007	508
Boston—Lawrence, MA	124.4	113.6	2007	466
Buffalo, NY	124.7	102.1	2002	942
Cleveland, OH	107.4	99.7	2004	996
Columbus, OH	76.5	91.5	2002	1,299
Dallas, TX	82.6	99.5	2002	1,431
Denver, CO	115.7	103.7	2004	1,238
Fort Worth—Arlington, TX	89.1	90.3	2002	1,302
Houston, TX	110.1	95.3	2007	647
Indianapolis, IN	96.2	89.3	2004	1,167
Kansas City, MO—KS	100.0	90.9	2002	1,188
Memphis, TN—AR—MS	97.0	88.9	2004	1,142
Miami—Hialeah, FL	104.7	129.1	2002, 2007	1,699
Milwaukee, WI	117.9	101.4	2002	1,068
Minneapolis—St. Paul, MN—WI	94.7	94.7	2007	690
New Orleans, LA	80.4	105.9	2004	910
Oklahoma City, OK	101.3	84.5	2004	1,140
Phoenix, AZ	116.0	106.8	2002	1,225
Pittsburgh, PA	86.8	90.4	2004	953
Portland, OR	102.3	101.3	2002	1,205
Riverside—San Bernardino, CA	41.5	93.5	2002	1,806
Sacramento, CA	110.9	99.1	2004	1,141
San Antonio, TX	100.6	95.0	2004	1,278
San Diego, CA	105.4	113.4	2002	1,178
Seattle, WA	79.4	103.6	2004	1,040
St. Louis, MO—IL	107.4	90.3	2004	1,076
Tampa—St. Peters—Clearwater, FL	80.0	93.6	2007	453
Washington, DC—MD—VA	78.7	106.9	2007	586

Note: AHS = American Housing Survey.

We merged the AHS data with a data set developed by Ewing, Pendall, and Chen (2002) that provided several smart growth indicators for metropolitan areas. The common set of metropolitan areas between the two data sets included a total of thirty metropolitan regions. Table 1 lists the metropolitan areas included in our analysis and reports the number of families with children in the sample and the year in which data were collected.[5] Slightly less than one fourth (23 percent, n = 7,460) of the families were headed by single mothers.

Variables and Constructs

Dependent variable: Neighborhood satisfaction. Respondents' satisfaction with their neighborhoods was measured by their subjective report of the quality of their neighborhoods collected in the AHS data. Respondents were asked, "How would you rate your neighborhood on a scale of one to ten."[6] Results were somewhat skewed, with most people rating their neighborhoods highly.[7] Thus, we examined the results with the full continuum as well as with a dichotomy that separated those with high satisfaction (scores 8, 9, and 10, and representing two-thirds of the sample) from those with lower levels of satisfaction. Below, we present the results with the full continuum, but those obtained with the dichotomy were identical and are available from the authors on request.

Independent variables: Smart-growth environmental measurements. We used measures of the context of urban form at both the metropolitan region and neighborhood scales. Most of the measures were obtained independently of the respondents, using either standardized measures (regional level) or observations of trained, independent observers (neighborhood level).

Smart growth at a regional scale. At the metropolitan region scale, we used measures developed by Ewing, Pendall, and Chen (2002), focusing on the indicators of urban

Table 2. Factor Analysis of Neighborhood Characteristics.

Variable	Factor Loadings				Uniqueness
	1: Mixed	2: Dense	3: SFD	4: Parks	
SFD detached	−0.03	−0.02	0.89	−0.03	0.21
SFD attached or low-rise	0.55	0.11	−0.53	−0.07	0.40
Mid-rise (4-6 stories)	0.12	0.76	−0.06	−0.01	0.40
High rise	0.03	0.80	−0.02	0.03	0.36
Commercial, Institutional, Industrial	0.78	0.12	−0.01	−0.05	0.38
Residential parking lots	0.70	0.06	−0.35	0.06	0.37
Body of water	−0.07	0.07	−0.07	0.78	0.38
Open space	0.10	−0.05	0.04	0.77	0.39
Highway, railroad, airport	0.66	−0.03	0.20	0.11	0.52
Eigenvalue	2.21	1.23	1.14	1.01	

Note: SFD = single-family dwelling.

development patterns that were most related to our research questions: compactness, or density, and the presence of land-use mix. To provide comparability, the indicators were combined into scale scores, centered around a mean of 100 (SD of 25), with higher scores indicating more "smart growth," that is, as having higher density and more mixed use. Table 1 includes the scores on the mixed use and density measures for each of the metro areas in our analyses and indicates substantial range in values. The areas with the highest mixed use scores were Anaheim–Santa Ana, California; Boston, Massachusetts; and Buffalo, New York, while those with the lowest were Riverside–San Bernardino, California; Atlanta, Georgia; and Columbus, Ohio. Highest scores on density were obtained by the Anaheim–Santa Ana and Miami metro areas and the lowest scores by Atlanta, Georgia; Oklahoma City; and Memphis, Tennessee.[8]

Smart growth at a local scale. Our measures of smart growth environments at a local scale were derived from the AHS data. Four of our neighborhood-level measures of urban form were based on interviewers' observations of the neighborhoods in which the units were located. Interviewers recorded the presence of a variety of characteristics within three hundred feet of the sampled unit, equivalent to about one block, and excluding the sample unit building. Characteristics recorded were the presence of (1) single-family detached house(s); (2) single-family, attached houses(s) or low-rise (one- to three-story) residential multiuse building(s); (3) midrise (four- to six-story) residential multiunit buildings; (4) high-rise (seven+ story) residential multiunit building(s); (5) commercial, institutional, industrial building(s); (6) residential parking lot(s); (7) body of water; (8) open space, park, woods, farm, or ranch; and (9) four-lane highway, railroad, or airport.

These nine indicators were subjected to factor analysis, using principal component factor analysis in Stata and a varimax rotation. Four interpretable scales, accounting for almost two-thirds of the common variance were found (see Table 2). The first two factors corresponded to conceptual understandings of mixed and dense neighborhoods. Factor one had high loadings from the measures of parking, commercial, and transportation-related characteristics, and factor two had high loadings from the indicators of high and midrise residential units. The third factor, with a high positive loading of single family dwellings and a negative loading of low-rise units corresponds to the exclusive single-family neighborhood context. The fourth factor, with high loadings from the indicators regarding nearby water and open space, indicates proximity to environmental amenities. Individuals' scores on these factors were computed and used in the analysis. These scores can be understood as descriptors of the neighborhoods in which people live. Higher scores on each factor indicate that respondents lived in a more mixed neighborhood, a denser neighborhood, a predominantly single-family neighborhood, and/or a neighborhood with more park-like amenities.[9]

In addition to the scales created from the interviewers' observations, we examined respondents' reports of their neighborhood's accessibility to shopping and public transportation, two key elements of the smart growth prescription of neighborhood environments. Respondents were asked, "Do you have satisfactory neighborhood shopping, that is, grocery stores or drug stores?" If they responded affirmatively, they were then asked, "Are any of these stores within one mile of you?" They were also asked, "Is the public transportation satisfactory?" From these questions, we created two dummy variables, one measuring the presence of satisfactory shopping in the neighborhood and the other measuring the presence of satisfactory public transportation.

Control variables. We used two different groups of control variables: some related to respondents' housing and neighborhood quality and others regarding their sociodemographic characteristics and ability to afford their housing.

Housing and neighborhood quality. Literature on residential satisfaction has suggested that the quality of one's housing

Table 3. Mixed Models Designed to Answer Research Questions.

Model No.	Aspects Examined in the Model (Number of Variables Entered)	Interpretation of Fixed Effects Coefficients
1	None (metro as a random factor)	→ Intercept only (mean of metro-means)
2	Family type (1)	→ Satisfaction gap (mean comparison controlling for metro)
3	Family type (1)	→ Satisfaction gap (controlling for SG characteristics)
	SG characteristics (8)	→ Effects of smart growth characteristics
4 and 5	Family type (1)	→ Satisfaction gap (controlling for SG characteristics and interaction by family type)
	SG characteristics (8)	→ Main effects of SG characteristics on the sample
	Interaction between family type and SG characteristics (8)	→ Differential effects of SG characteristics on single mothers
6	Family type (1)	→ Satisfaction gap (controlling for all variables in model)
	SG characteristics (8)	→ Main effects of SG characteristics on the sample
	Interaction between family type and SG characteristics (8)	→ Differential effects of SG characteristics on single mothers
	Controls (9)	→ Effects of control variables

Note: SG = smart growth.

and neighborhood, objectively measured or subjectively assessed, is a major determinant of his or her neighborhood satisfaction (Lu 1999; Parkes, Kearns, and Atkinson 2002). We used two measures of respondents' neighborhood and housing quality, both based on respondents' assessments. The first was respondents' report of neighborhood problems. This indicator came from a series of questions that asked respondents to report aspects of their neighborhood that could be bothersome (people, undesirable properties, poor services, litter or housing deterioration, noise, crime and street traffic). We created a summative indicator of the number of problems that they reported, which ranged from 0 to a maximum of 7. The second measure came from a direct question to respondents regarding the quality of their housing, asking them, "On a scale of 1 to 10, how would you rate your unit as place to live?"

Sociodemographic and other controls. We used four indicators of sociodemographic characteristics as control variables: race/ethnicity, education, age, and monthly family income, similar to previous studies (Galster and Hesser 1981; Parkes, Kearns, and Atkinson 2002). Race/ethnicity was a simple dummy variable, distinguishing non-Hispanic whites from others. Education was measured as the years of education respondents reported, and ranged from zero to eighteen. Age was given in years, and family income was given in dollars adjusted to the 2007 value using the CPI index. To examine respondents' ability to translate their resources into residential quality we computed a measure of housing affordability, calculated as the percentage of household income spent on housing expenses. Finally, to control for variations across time, we included dummy variables for the year the surveys were conducted with 2007 as the omitted category.[10]

Analysis Plan

To answer our first question regarding differences between single mothers and parents in two-parent families in neighborhood environments and satisfaction, we used simple descriptive statistics, examining measures of central tendency within each family type. As noted above, we expected, based on previous literature, that single mothers would have lower levels of neighborhood satisfaction than two-parent families and that their environments would be more problematic in nature.

To answer the second and third research questions regarding the relationship of smart growth and other variables to this gap in satisfaction, we ran a series of mixed models. Mixed models are especially appropriate and useful for analyses that involve nested or multilevel data (see Singer 1998). They allow us to examine relationships among variables measured on the individual level, such as neighborhood satisfaction and neighborhood characteristics, while controlling for those at a higher level of analysis, such as measures of the built environment of a metropolitan region. A series of successively more complex models were examined, all including the metro level of residence as a random effect.

Table 3 summarizes variables in the models and the ways in which they address the research questions. As more variables were included in the model, model fit statistics (−2 log likelihood ratio and Akaike's information criterion) were examined to determine the extent to which a more complex model provided a better fit. Fixed effect coefficients were examined to determine the impact of each variable and the ways in which relationships changed as additional variables were introduced.

Model 1 is a baseline, intercept only model, equivalent to an analysis of variance with metro as a factor. Starting in model 2, we included a dummy variable representing family

Table 4. Average Values, All Variables, by Family Type.

	Two-Parent	Single-Mother	Cohen's *d*
Dependent measures			
Satisfaction with neighborhood	7.97	7.34	−0.33
Neighborhood and metro-level context			
Mixed metro scale	96.50	96.60	0.01
Dense metro scale	100.10	99.50	−0.06
Mixed neighborhood scale	−0.10	0.34	0.44
Dense neighborhood scale	−0.03	0.10	0.13
Single-family neighborhood scale	0.08	−0.26	−0.33
Green amenities neighborhood scale	0.04	−0.13	−0.17
Satisfactory shopping	0.73	0.78	0.12
Convenient public transit	0.57	0.72	0.31
Housing consumption			
Number of problems in neighborhood	0.54	0.78	0.28
Satisfaction with housing	8.12	7.63	−0.28
Sociodemographic and control variables			
Non-Hispanic white	0.65	0.43	−0.45
Education	13.70	12.80	−0.33
Age	39.20	38.80	−0.03
Monthly family income (2007 $)	8,319	3,128	−0.52
Housing costs as percent of income	25.74	40.93	0.70
N	25,024	7,460	

type (with 1 = single mothers and 0 = two-parent families). The coefficient associated with this variable provided an estimate of the satisfaction gap between single mother and two-parent families. Changes in this coefficient across successive models indicate the way in which controlling for aspects relevant to neighborhood satisfaction affect this gap. Starting in Model 3 we included the various measures of smart growth environment characteristics to examine their impacts on neighborhood satisfaction.[11] In Model 4 we added the interaction of these smart growth variables with family type to examine the differential effects of smart growth for single mothers and two-parent household respondents. Because only some of the interaction variables added in Model 4 were statistically significant, we omitted the insignificant interaction terms and calculated a reduced model, Model 5, producing a more parsimonious analysis. Finally, Model 6 added all control variables including the measures of neighborhood and housing quality as well as the sociodemographic control variables and the dummy variables for the year of the survey. Results from Models 3 through 5 directly addressed Research Question 2, while those from Model 6 addressed Research Question 3.

Findings

Differences in Neighborhood Environments and Satisfaction

To address our first research question, we compared the average values on each of the variables in the analysis for single mothers and for respondents in two-parent households. Table 4 reports the mean values and Cohen's effect size, *d*, for each comparison. The effect size, which is simply the difference of the means divided by the standard deviation, provides an estimate of the magnitude of the difference that is unaffected by the large sample size and can be compared across variables with different ranges or scales. An often used, though admittedly arbitrary, criterion for effect sizes is to describe values of .20 as small, .50 as medium, and .80 as large in magnitude (Cohen 1992).

The gap in neighborhood satisfaction between single mothers and respondents from two-parent households was 0.63 on a 10-point scale, representing a small to medium effect (d = 0.33). There were almost no differences in the characteristics of the metropolitan regions in which the two groups lived; but stronger differences in neighborhood environments. Single mothers more often lived in areas that could be termed smart-growth environments. The largest differences, again with small to moderate effects, were found in their residence in neighborhoods that embodied mixed use, had accessible public transportation, and were not exclusively single-family dwellings.

Consistent with findings from the existing literature, single mothers lagged behind two-parent households in many other aspects reported as determinants of neighborhood satisfaction (Spain 1990; Downey 2005; Downey and Hawkins 2008). They reported more problems within their neighborhoods and lower levels of satisfaction with their housing units. The largest differences were with the measures of

Table 5. Model Fit Statistics and Model Elements.

	Model Fit Statistics					
	LL	−2 * LL	Ch. In −2 LL	df	*p*	AIC
1	−66,705.6	133,411.1				133417.1
2	−66,384.9	132,769.8	641.3	1	<.001	132777.8
3	−65,535.0	131,070.0	1,699.7	8	<.001	131094.0
4	−65,497.2	130,994.3	75.7	8	<.001	131034.3
5	−65,498.2	130,996.3	73.7	3	<.001	131026.3
6	−56,962.7	113,925.4	17,170.9	7	<.001	113973.4

Note: For all models except Model 5, a given model is compared to the previous simpler one (e.g., 2 to 1, 3 to 2, 4 to 3, and 6 to 5). Model 5, which include the reduced group of interaction effects, is compared to Model 3. LL = log likelihood; AIC = Akaike's information criterion.

housing affordability and family income. Single mothers paid a substantially higher proportion of their income for housing costs compared with respondents from two-parent households and had much lower family incomes. Finally, there were differences in sociodemographic characteristics consistent with previous literature. Single mothers were less likely to be non-Hispanic whites, had lower levels of education, and were younger than other respondents.

Smart Growth, Neighborhood Satisfaction, and Single Mothers

Our second research question asked if smart-growth environmental characteristics contribute to respondents' satisfaction with their neighborhoods and if these characteristics help reduce the gap in satisfaction between single mothers and parents in two-parent families. The results with the mixed model analyses, reported in Tables 5 and 6, address this question. Table 5 gives the model fit statistics for each of the models. The −2 log likelihood ratio statistics have a chi-square distribution and can be compared across models; and the AIC is a descriptive measure based on the log likelihood values. For both measures, a smaller value indicates a better fit of the data. Table 6 gives the coefficients for the analyses. Results with Models 3, 4, and 5 directly address this research question.

Adding measures of smart-growth environments to the model (Model 3 compared to Model 2) produced a significantly better fit of the data. The coefficients associated with each characteristic showed, as expected, different results from one aspect of smart growth to another. Respondents reported significantly less satisfaction in more mixed and dense neighborhoods with public transit, but significantly more satisfaction in neighborhoods with more single family dwellings, green space, and satisfactory shopping as well as in metro areas that were denser. The gap in satisfaction between the two groups became substantially smaller once variation in built environment characteristics were controlled in Model 3. To save space the results for Model 2, which only included family type as a predictor, were omitted from Table 6. The coefficient associated with family type in that model was −.63. Thus, the coefficient of −.36 in Model 3 represented a 42 percent decline in the gap between the two groups once the built environment characteristics were controlled for.

Interaction effects between family type and smart growth were added in Model 4 to examine if the impact of smart growth characteristics varied for single mothers and those in two-parent families. As expected, these interaction effects were significant for only some of the characteristics: satisfactory neighborhood shopping, the presence of public transportation, and metro density. To ease interpretation we then computed a reduced model (Model 5), which only included these significant interactions. In all cases, the interactions resulted in stronger impacts of smart growth environments for single mothers than for those in two-parent families. That is, both the positive relationship of neighborhood shopping and metro density with neighborhood satisfaction and the negative relationship of nearby public transit with satisfaction were larger for single mothers than for those in two-parent families. As a result, the gap in satisfaction between single mothers and those in two-parent households was greater in some environments than in others, and the nature of this gap depended upon the particular aspect of smart-growth environments that was considered.

The Impact of Housing Consumption and Demographic Variables

Our third research question asked to what extent negative relationships of smart-growth environments and neighborhood satisfaction could be explained by the quality of housing that respondents can obtain and their sociodemographic characteristics. This question is addressed by Model 6, which added the two indicators of housing and environmental quality—the number of problems reported in the neighborhood and respondents' satisfaction with their housing—as well as the demographic variables (race-ethnicity, education, age, monthly income, and housing costs as percentage of monthly income) to the model. The addition of these variables provided a significantly better fit, and all of the variables had highly significant and independent relationships with neighborhood satisfaction. The direction of influence was as expected. Respondents were more satisfied with their neighborhoods when they perceived fewer problems and had more satisfactory housing. In addition, respondents who were non-Hispanic whites, more highly educated, older, with higher incomes, and who paid a higher proportion of their incomes for housing reported significantly more satisfaction with their neighborhoods. There was no significant difference in satisfaction levels across years in which data were gathered.

Once the housing consumption and demographic indicators were added to the model the impact of the interaction effects (the differential influence of smart growth across family types) became substantially smaller. With neighborhood level measures the interaction effects were still

Table 6. Mixed Models, Regressing Neighborhood Satisfaction on Neighborhood and Metro Characteristics of Smart Growth & Family Type.

	Model 3			Model 4			Model 5			Model 6		
Fixed Effects	*b*	SE	*p*	*b*	SE	*p*	*b*	SE	*p*	*b*	SE	*p*
Constant	7.11	0.24	<.001	7.24	0.25	<.001	7.23	0.25	<.001	2.89	0.16	<.001
SMF	−0.36	0.03	<.001	−0.88	0.21	<.001	−0.86	0.21	<.001	−0.23	0.16	0.16
Neighborhood mix	−0.30	0.01	<.001	−0.30	0.01	<.001	−0.30	0.01	<.001	−0.03	0.01	0.002
Neighborhood density	−0.08	0.01	<.001	−0.06	0.01	<.001	−0.07	0.01	<.001	−0.01	0.01	0.48
Neighborhood SFD	0.18	0.01	<.001	0.18	0.01	<.001	0.18	0.01	<.001	0.05	0.01	<.001
Neighborhood green space	0.13	0.01	<.001	0.13	0.01	<.001	0.13	0.01	<.001	0.06	0.01	<.001
Shopping satisfactory	0.17	0.02	<.001	0.08	0.03	0.004	0.08	0.03	0.004	0.04	0.02	0.06
Transportation satisfactory	−0.33	0.02	<.001	−0.26	0.03	<.001	−0.26	0.03	<.001	−0.04	0.02	0.06
Metro mix * 10^4	4.31	15.79	0.79	5.83	16.11	0.72	5.13	15.81	0.75	8.78	8.16	0.28
Metro density * 10^4	84.11	26.21	0.001	72.63	26.77	0.01	73.87	26.68	0.01	27.25	15.23	0.07
SMF * neighborhood mix	–	–	–	–0.01	0.02	0.64	–	–	–	–	–	–
SMF * neighborhood density	–	–	–	–0.02	0.02	0.23	–	–	–	–	–	–
SMF * neighborhood SFD	–	–	–	0.01	0.02	0.54	–	–	–	–	–	–
SMF * neighborhood green space	–	–	–	0.00	0.03	0.88	–	–	–	–	–	–
SMF * shopping	–	–	–	0.41	0.06	<.001	0.41	0.06	<.001	0.17	0.04	<.001
SMF * transportation	–	–	–	−0.30	0.06	<.001	−0.31	0.05	<.001	−0.24	0.04	<.001
SMF * more mixed * 10^4	–	–	–	–2.23	13.78	0.87	–	–	–	–	–	–
SMF * more dense * 10^4	–	–	–	44.75	22.81	0.05	40.65	20.97	0.05	11.85	16.14	0.46
Neighborhood problems	–	–	–	–	–	–	–	–	–	−0.63	0.01	<.001
Housing satisfaction	–	–	–	–	–	–	–	–	–	0.55	0.00	<.001
Non-Hispanic white	–	–	–	–	–	–	–	–	–	0.04	0.02	0.03
Years of education * 10^2	–	–	–	–	–	–	–	–	–	1.18	0.32	<.001
Age * 10^2	–	–	–	–	–	–	–	–	–	0.71	0.08	<.001
Income * 10^6 (2007 $)	–	–	–	–	–	–	–	–	–	2.33	0.88	0.01
Housing costs as percentage of income * 10^4	–	–	–	–	–	–	–	–	–	14.78	4.05	<.001
Year 2002	–	–	–	–	–	–	–	–	–	0.04	0.04	0.22
Year 2004	–	–	–	–	–	–	–	–	–	0.06	0.04	0.11
Random effects												
Intercept	0.017	0.005	<.001	0.0173	0.0055	<.001	0.017	0.005	<.001	0.004	0.001	<.01
Residual	3.305	0.026	<.001	3.2969	0.0259	<.001	3.297	0.026	<.001	1.951	0.015	<.001

Note: For the intercept-only model, $b = 7.84$, SE = .03, $p < .001$. For model 1, including only family type, the intercept $b = 7.98$, SE = .03, $p < .001$; the coefficient associated with family type = –.63, SE = .02, $p < .001$. For the intercept only model, the random effect for the intercept = .018, random effect for the residual = 3.552. For model 2, the random effect for the intercept = .015, random effect for the residual = 3.483. Total number of observations = 32,484, 30 metros, average observations per metro = 1082.8, range of metro sample size = 453 to 1806. SMF = single-mother family; SFD = single-family dwelling.

statistically significant, but with the metro level measure of density the effect declined to insignificance. In other words, the greater positive impact of satisfactory neighborhood shopping and the greater negative impact of nearby transit for single mothers was reduced, but remained significant, when measures of their housing quality and demographic characteristics were equalized. In addition, the greater positive impact of metro level density on neighborhood satisfaction for single mothers declined to insignificance.

Finally, once the housing quality and demographic variables were controlled, the satisfaction gap between single mothers and two-parent households was reduced substantially and became statistically insignificant. This suggests that the variation in the reported neighborhood satisfaction is, to a great degree, explained by the discrepancies in residents' housing and neighborhood qualities, as well as their background characteristics. The explanatory power of these control variables was clearly greater than that of the smart growth variables.

Summary of Findings

The results described above provided mixed support for our expectations. Our research confirmed the persistent gap that single mothers experience in their residential satisfaction. It revealed discrepancies in various built environment characteristics between residences of single mothers and two-parent households. Single mothers are less satisfied with their neighborhoods. Compared with two-parent households, they more often live in areas that are closer to nonresidential uses

and public transportation and are less likely to include a predominance of single-family homes.

Our main research question addressed the extent to which these urban form differences were related to the variations in families' neighborhood satisfaction. Results from a series of mixed models revealed that the impacts of the two major defining smart growth characteristics—density and land-use mix—depended on the spatial scale at which these characteristics were examined. At a proximate or intimate spatial scale, such as at the street-block level, higher density and land-use mix were found to affect neighborhood satisfaction in a negative direction for both population groups. Yet positive impacts on satisfaction were revealed for smart growth variables at a broader spatial scale, such as having good shopping within a mile and higher densities at a regional scale. Presence of public transportation in the neighborhood, often considered a desirable smart growth feature, was found to have negative impacts on satisfaction.

Finally, our research generated findings that shed light on sources of the satisfaction gap between single mothers and two-parent households. Our results confirmed the findings of others that single mothers were of more disadvantaged socioeconomic status and more often lived in neighborhoods with problematic characteristics. These discrepancies, together with differences in the built-environment characteristics, explained a substantial proportion of the satisfaction differences between single mothers and two-parent households. Once variables related to environmental quality and demographic characteristics were considered, the satisfaction gap between single mothers and two-parent households became statistically indiscernible.

Based on our analysis, the kind of environment related to the highest satisfaction for single mothers appears to involve a cluster of exclusively single-family dwellings in proximity to green/open space, without the immediate presence of nonresidential uses, and with good shopping nearby. This kind of environment produces even more satisfaction for single mothers in a more compact region. On the contrary, a smart growth neighborhood with a fine-grained mix of land uses, lacking green/open space and in a sprawling region results in lowered satisfaction for this group and a greater satisfaction gap in comparison to two-parent families.

Discussion

This article systematically examines the living conditions of single mothers using AHS data. The extensive data sets from the AHS for thirty different metro areas provided a large sample with representation from a broad range of metropolitan areas. Our analysis included relatively strong controls for environmental characteristics at both the neighborhood and metro level as well as sociodemographic individual-level controls. Like many other studies attempting to investigate the relationship between smart growth characteristics and quality of life, however, our study is far from perfect and can be improved in the following aspects. In large part, these drawbacks reflect the nature of the AHS data set, which was designed to be of use to researchers and policy makers in a wide range of specialties and with varied interests. Smaller studies, focused on more limited geographic areas, could nicely supplement our analyses.

First, alternative and more nuanced measures could be used to more fully tap the concepts embodied within smart growth. The regional measures were specifically developed to capture this concept but, because they were calculated for very large regions, they may not capture subtle variations across localities. The neighborhood-level measures could also be refined, and it is possible that neighborhood indicators that specifically focused on aspects unique to smart growth, rather than density or mixed use in a broader sense, would have different results. Second, our analysis was highly quantitative in nature, allowing us to summarize relationships for large numbers of people in a wide variety of settings. Yet, such quantitative analyses may fail to capture the day-to-day lives of families and the ways in which they interact in their environments. Finally, qualitative designs might be able to begin to explore the ways in which single mothers and those in other family arrangements negotiate different living environments. This could provide understanding of the ways in which smart growth can impact families' lives and address their needs.

Nevertheless, our results offer important insights for planners pertaining to their practices with and expectations of smart growth. Several points can be summarized here. First, our findings, consistent with other research, point to the lack of conclusive evidence about the superiority of urban environments for single mothers with regard to their overall quality of life, at least when measured as satisfaction. Our findings particularly highlight the potential issues associated with having mixed use at a fine spatial scale for families with children. While adverse effects with this smart growth feature could be expected for both groups of parents considered in our analysis, they may be especially problematic for single mothers. Given their lower incomes, they are more likely to live with low-quality mixed use in their smart growth neighborhoods and thus would be more exposed to the associated environmental problems. The finding that the differences in satisfaction disappeared when neighborhood problems and housing quality were controlled supports this conclusion.

Based on our findings, we suggest that neighborhood design that maintains a somewhat homogeneous immediate environment and mitigates use-based conflicts could be especially desirable for single mothers. Thus planners could consider a family-friendly smart growth strategy that carefully integrates small clusters of single-family dwellings at higher densities with mixed land uses and green space that improves accessibility to various services. A 2005 news report in the *New York Times* (Egan 2005) documented the way in which many booming cities are experiencing loss of children in their populations and closure of schools. To help

reverse this trend, planners could capitalize on the beneficial aspects of compact, mixed-use neighborhoods and make these benefits available to families of all types. They should also recognize that these environments do not necessarily meet residential needs or priorities associated with different stages in the life cycle.

A second major implication of our work involves interesting findings regarding the impacts of regional environments. We began the research with the concern that single mothers could be more disadvantaged in more compact regions. A surprising finding of our results was the positive association of metro-level density with neighborhood satisfaction. This appears opposite to Kahn's (2001) findings that higher regional densities result in a more disadvantaged position for economically and socially vulnerable groups. Our research focused on neighborhood satisfaction, likely a more appropriate indicator for assessing smart growth's impacts on quality of life than the housing consumption measures used in Kahn's research. While sprawl appears to benefit indicators of housing consumption, regional compactness may bring better job and service accessibility. These may be more important factors affecting quality of life, especially for a vulnerable population group such as single mothers.

An additional explanation of the positive relationship of satisfaction and metro-level density may involve issues of housing supply. When a region becomes more compact and mixed-use, there is likely a greater supply of compact and mixed-use neighborhoods (see Song and Knapp 2004). The greater supply may translate into greater choices of housing and neighborhoods for single mothers. Much of the argument for New Urbanism and smart growth has been evolving around the benefits of offering housing consumers more choices (Levine 2005). As studies have shown that constrained choice in housing is related to lower levels of residential satisfaction (Michelson 1977; Rapoport 1980; Simms 1980), the increase in supply could offer single mothers more options in the housing market, greater control in the process of their residential mobility, and thus, higher levels of satisfaction.

Finally, our findings indicated that smart growth characteristics had a stronger relationship with satisfaction for single mothers than for two-parent households. There were greater positive effects associated with shopping accessibility and greater negative effects associated with public transportation accessibility. One could suggest that, given their lower incomes, single mothers are subject to the lower-end quality associated with smart growth features such as the presence of public transportation. While improved transportation options bring some advantages to single mothers, latent undesirable environmental conditions correlated with this smart growth feature (e.g., presence of noisy arterial roads) may be more detrimental to their neighborhood satisfaction.

Ultimately, single mothers' exposure to low-quality environments stems from their limited economic resources, which makes them highly vulnerable to the housing affordability problem. In many consciously compacting cities, processes and policies should be deliberately used to address housing affordability issues and the needs of vulnerable population groups such as single mothers. Some studies have shown that the smart growth movement in the United States generally lacks adequate engagement of minority and low-income residents (Rast 2006; Day 2003). Other work notes that smart growth policies often fail to adequately address affordable housing issues (Johnson and Talen 2008). Our results suggest that smart growth approaches that are limited to physical form concerns while ignoring the complex and multifaceted ways in which environments influence people's well-being will not automatically make those environments better for disadvantaged groups such as single mothers. It is important for planners and designers to recognize the limited efficacy of physical planning–oriented solutions to a problem with deep social and economic roots. In the end, for any environment to work for single mothers, desirable environmental quality in social terms and the presence of collective options may be more important than physical design.

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Notes

1. This article focuses on "smart growth environments" or "smart growth urban form." It does not address policies and processes involved in smart growth planning. We provide a brief discussion about the importance of adopting affordable housing policies in smart growth, but we believe the policy component is beyond the research scope of this article. We use the two terms "smart-growth environments" and "smart-growth characteristics" interchangeably in this article to refer to the presence of "compactness and mixed uses in the built environment."
2. We acknowledge that while there is similarity in housing needs between single mothers and the two-parent families because of the presence of children, the two groups are quite different in many aspects. We suggest that it is because of these differences that there is a persistent gap in the residential satisfaction experiences between these two groups, with the two-parent group enjoying far more favorable experiences than the single-mother group. Past literature suggests that much of the gap can be accounted for by the different demographic characteristics of the two groups. Our current research focuses on the

gap and brings attention to the built environment—whether we can reduce the gap by placing stronger emphasis on providing more smart growth environments in a region. In our analyses of the satisfaction gap, we also control, as much as we can, for other differences between these two groups.

3. Residential satisfaction can be defined as the degree to which one's residential environment can meet his or her needs and further the attainment of his or her goals. When appropriately operationalized and measured, "satisfaction" can be used to measure perceived environment quality, make inferences about properties of places, and compare different settings (Francescato 2002). Operationalization of residential satisfaction often takes the form of households' evaluation (ranking or rating) of their living condition, which is generally collected through survey instruments that ask residents what qualities they associate with a good housing environment, how they rate their residential environment, and/or the reasons for giving positive ratings (Brower 1996). Generally the households are provided with a scalar measure (1 to 10, 0 to 4, for example) to express their satisfaction, with the two extremes representing least satisfied and completely satisfied respectively. The rating can be obtained for the residential environment as a whole or for specific features of the living environment. While most existing satisfaction studies are based on the researchers' own survey data, some researchers have used large national survey data such as the American Housing Survey (Cook and Bruin 1993; Spain 1988; Lu 1999; Varady 1983; Dahmann 1983) or National Survey of Black Americans (Scanlon 1998) to perform satisfaction-related analyses.
4. The life-cycle factor refers to the various demographic variables that are indicative of a respondent's housing needs at different stages in the life cycle, which can affect one's housing choice and how one may evaluate his or her residential environments. These variables often include family structure, presence of children, age, etc. We purposely controlled for the life-cycle factor by limiting our comparison group to married couples with children, a group with comparable housing needs with single mothers because of the presence of children. Excluded from our analyses were singles, single-father households, grandparents with children, and households without children.
5. Twelve metros were included in 2002 and 2004 and seven in 2007. Miami was included in both 2002 and 2007. The number of cases in the sample declined over time, from a maximum of 15,264 in 2002 to 3,851 in 2007. Two metro areas that had AHS data (Charlotte and Hartford) were omitted from the analysis because we did not have data on two key independent variables (metro-level density and mixed use) for these areas.
6. Although the satisfaction measure from the AHS is less than ideal, it is not an uncommon measure of satisfaction (see Francescato 2002; Galster and Hesser 1981) and has been used in several studies involving residential satisfaction (Lu 1999, Nelson, Sanchez, and Dawkins 2007; Spain 1991; Yang 2008). Studies have shown that satisfaction scores reported in the AHS vary systematically with real differences in neighborhood conditions (Goering 1979). The AHS neighborhood rating question was preceded by a series of specific questions pertaining to housing conditions, land-use mix, and perceived problems in a respondent's neighborhood, and it was asked in a way that would help the respondent to focus on factors that are commonly viewed as important in evaluating neighborhood qualities. The full question is: "In view of all the things we have talked about, on a scale from 1 to 10, how would you rate this neighborhood as a place to live?" (U.S. Census Bureau 2004, 484)
7. The skewedness of the satisfaction measure results in relatively small variation in the dependent variable as most of data points concentrate in the value range from 7 to 9. This could make it difficult to identify impacts associated with the independent variables. The fact that some smart-growth environmental variables are still found to have statistically significant associations with the dependent variable indicates that the connections are indeed distinctive.
8. When Riverside, the metro area with extreme values on density, was omitted from the analysis, the results were identical to those that are presented here.
9. Because our analysis includes respondents from several different metropolitan areas it is important that we have a consistent measure of neighborhoods across all settings. However, metro areas can, and do, differ in the mix of neighborhoods that they contain. Our multivariate analysis, described below, included controls for the metro area of residence and helped control for these variations.
10. In additional analyses, we also included respondents' gender as a control variable. The pattern of results was identical to that reported below apart from a slight increase in the magnitude of the difference between the types of families. This resulted from a tendency for women (in both types of families) to report more satisfaction than men. We chose to omit this control from the analysis to provide a more conservative estimate of the difference between the two family groups. Additional analyses also included respondents' receipt of housing assistance, such as vouchers, and the age of housing as controls. Neither of these variables provided significantly better fit and neither was a significant influence on satisfaction net of other variables in the models.
11. In analyses not included here, we examined the impact of smart-growth environmental variables on the neighborhood level separately from the impact of smart-growth environmental variables on the metro level. Results were the same as those reported here, which include their joint influence.

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