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## The places parents go: understanding the breadth, scope, and experiences of activity spaces for parents

Jennifer Price Wolf, PhD<sup>a</sup>, Bridget Freisthler, PhD<sup>a,b</sup>, Nancy Jo Kepple, PhD<sup>b</sup>, and Raúl Chávez, MALD<sup>c</sup>

<sup>a</sup>Prevention Research Center, 180 Grand Avenue, Suite 1200, Oakland, CA, 94612

<sup>b</sup>UCLA Luskin School of Public Affairs, 337 Charles E. Young Drive East, Los Angeles, CA, 90095

<sup>c</sup>University of California, Berkeley School of Social Welfare, 120 Haviland Hall, Berkeley, CA 94720

### Abstract

Neighborhood environments are related to parenting behaviors, which in turn have a life-long effect on children's health and well-being. Activity spaces, which measure individual routine patterns of movement, may be helpful in assessing how physical and social environments shape parenting. In this study we use qualitative data and GIS mapping from 4 California cities to examine parental activity spaces. Parents described a number of factors that shape their activity spaces including caregiving status, the age of their children, and income. Parental activity spaces also varied between times (weekends vs. weekdays) and places (adult-only vs. child-specific places). Knowing how to best capture and study parental activity spaces could identify mechanisms by which environmental factors influence parenting behaviors and child health.

### Keywords

activity spaces; qualitative research; parenting; GIS

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A wealth of literature suggests that characteristics of the neighborhood environment are associated with parenting behaviors (Coulton et al. 1999; Guterman et al. 2009; Burton and Jarrett 2000; Leventhal and Brooks-Gunn 2000; Freisthler and Gruenewald 2013; Freisthler et al. 2014) and these, in turn, are related to long-term health and behavioral health consequences for children (Springer et al. 2007; Fuller-Thomson et al. 2011; Afifi et al. 2013; Elliot et al. 2014). Neighborhood environments may consequently have a significant and life-long effect on children's health that is mediated by parent behaviors.

### Why Neighborhoods Matter for Parenting

Where people live shapes how they parent, yet there is no broad consensus on the mechanisms by which environments affect parenting (Freisthler and Holmes 2012). Social ecological theory provides a framework for understanding complicated relationships

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Corresponding author: Jennifer Price Wolf, Associate Research Scientist, Prevention Research Center, 180 Grand Avenue, Suite 1200, Oakland, CA 94612-3749; jwolf@prev.org. (510) 486-1111 ext. 5757 (p). (510) 644-0594 (f).

between individuals and their environment (Stokols, 1996). This theory argues that both physical and social conditions influence individual health behaviors. In the case of parents, specific physical features of the environment (e.g. liquor stores or social service agencies) could thus have a direct impact on parenting (Freisthler and Gruenewald, 2013). For example, due to ease of access, parents living in neighborhoods with more parks may take their children outdoors to play more often, which could in turn reduce risk of childhood obesity and related health problems (Blanck et al. 2012). In this view, the neighborhood environment determines the level of exposure to physical features that act as risks or resources influencing parental behavior and subsequent child health. . According to social ecology theory, the social environment of a community is also associated with behaviors (Stokols, 1996). For example, the social characteristics of a neighborhood, such as levels of social organization and local social networks appears to impact parenting behaviors (Byrnes and Miller 2012; Freisthler and Holmes 2012).

While the physical and social features of the environment appear to matter for parenting, most of the neighborhood effects in existing literature are small (Coulton et al. 2007; Leventhal and Brooks-Gunn 2000; Guterman et al. 2009). In addition, interventions designed to relocate families to new neighborhoods have not necessarily demonstrated expected positive results for child outcomes (Orr et al. 2003; Freisthler & Holmes, 2012). Part of this discrepancy may be the focus on local neighborhoods as a measure for understanding the physical and social risks and resources that parents encounter.

Recently, the focus on the residential neighborhood's role in health has been questioned by observations that people often travel and spend time outside of their own communities (Sastry et al. 2002; Kwan 2009; Mennis and Mason 2011). Instead of conceptualizing the neighborhood environment as a static entity (e.g. characteristics of the area surrounding a parent's home), there has been a shift to examining how environmental exposures vary by individual-specific characteristics and circumstances (Kwan 1998; Matthews 2011). As a result, environmental influences on parenting behaviors may be highly individualized and related to both the characteristics of parents and the places that they go. For example, if parents who are employed full-time spend the majority of their time outside of their local neighborhood, the local community may not be an adequate measure of their exposure to features like liquor stores or parks or geographically-embedded social networks.

## Thinking Beyond Neighborhoods to Activity Spaces

“Activity spaces” have been proposed as a way to capture more accurate representations of how people dynamically engage with their environments (Horton and Reynolds 1971; Golledge and Stimson 1997). Activity spaces use geocoded information about the routine places that people go (e.g. work, doctor's office, etc.) to create individual-specific assessments of exposure to and use of the environment. Thus, activity spaces acknowledge that the risks and resources encountered in the physical and social environment vary by individuals. Initial work suggests activity spaces are related to health and behavioral health outcomes (Inagami et al. 2007; Mason and Korpela 2009; Zenk et al. 2011; Kestens et al. 2012; Martinez et al. 2014), including parenting behaviors (Freisthler et al. 2015). In addition, environmental exposures differ significantly between measures based on an

individual's home neighborhood and their actual activity spaces (Inagami et al. 2007; Kestens et al. 2010; Zenk et al. 2011; Jones and Pebley, 2014; Byrnes et al., 2015; Lyseen et al., 2015; Lipperman-Kreda, Morrison, Grube, & Gaidus, 2015). For example, Matthews, Detwiler, and Burton (2005) used in-depth GIS information to track the activity spaces of parents receiving welfare, noting that the routine places frequented by study families were not well captured by traditional designations of neighborhood, such as census tracts or zip codes.

Activity spaces may thus provide a clearer sense of the magnitude of relationships between environmental influences, local social networks, and parenting behaviors. For example, having more friends in your neighborhood is associated with smaller activity spaces (Jones and Pebley, 2014). This situation could be problematic for parents in neighborhoods with less social organization and fewer positive parenting role models, as smaller activity spaces would mean more concentrated exposure to potentially negative social norms. In contrast, small activity spaces for those in socially organized neighborhoods may be less problematic. A recent exploratory study by Freisthler et al. (2015) found that parents with smaller activity spaces were more likely to use punitive parenting (e.g. psychological aggression or corporal punishment).

While this initial finding suggests that the size of activity spaces may be meaningful for parenting, it did not examine the types of places that parents go. Emerging evidence suggests that assessments of risk or resources within activity spaces influence health behaviors (Chan, Gopal, & Helfrich, 2014; Gibson, Perley, Bailey, Barbour, & Kershaw, 2015). For example, parents with their children may stay away from places that are adult-centric, such as rowdy restaurants or downtown business districts. In addition, they might maneuver their spaces to avoid areas with open drug dealing or other perceived risk. Conversely, they may seek out places with significant resources, such as areas densely populated with parks, libraries, or child friendly activities. Parents may consequently be seen as active agents in the development of activity spaces.

While parents may aim to shape activity spaces due to their desired exposures, their movement may be constrained or altered by their individual demographic characteristics and role-statuses. Emerging evidence suggests that demographic characteristics shape activity spaces (Kestens et al., 2010; Villanueva et al., 2012; Hirsch, Winters, Clarke, & McKay, 2014; Jones & Pebley, 2014; Perchoux et al., 2014). For example, the size of activity spaces and types of places individuals frequent appear to differ by income, although this finding varies by the environment studied. While low-income rural residents may have smaller activity spaces due to lack of cars and reliance on public transportation (Kamruzzaman and Hine 2012), high income individuals may spend a larger percentage of leisure time at home, limiting interaction with people outside of their privileged neighborhood (Wang et al. 2012). Income could consequently be a significant factor in parental activity spaces. However, further study is needed to understand how these characteristics contribute to parent interactions with their environment.

Caregiving role (e.g. primary caregiver) could also influence parental activity spaces. In a study of women, childcare duties were cited as limiting the activity spaces of mothers

(Kawase 1999; Noack 2011), potentially due to mothers' spending greater time with children and on household duties (Parker and Wang 2013). Parents who are primary caregivers may avoid unnecessary shopping, fancier restaurants, movies, or other places where social norms call for long periods of sitting and waiting. Thus childcare burden may play a significant role in the distance or diversity of places to which parents travel. However, the impact of parenting on activity spaces may also differ by child age. Primary caregivers of older children may travel often to schools, classes, or other locations tied to their role that are located a significant distance from their home. In contrast, primary caregivers of very young children may have more circumscribed activity spaces due to their child's need for regular naps and could limit travel to parks, libraries, or stores close to their home (Kawase 1999). These places may in turn influence the social relationships they form as well as the health of their children.

## Study Aims

In this study, we integrate social ecology theory with an understanding that environmental exposures are individually experienced through activity spaces. In addition, we argue that individuals shape activity spaces based on their perceptions, opportunities, and desired exposures to resources and risks. Nuanced understandings of these processes are best captured in qualitative research, which provides the opportunity for in-depth exploration of phenomena. In this study, we use qualitative and GIS-data to present both visualizations and holistic understanding of parent activity spaces (Matthews et al. 2005; Kwan 2007; Kwan and Ding 2008; Kamruzzaman and Hine 2012; Mennis et al. 2013). We extend current work in this area by focusing theoretically and analytically on how role status (e.g. parenting) and other life forces (e.g. income) shape the size and quality of activity spaces for parents of young children in four mid-sized California cities. Specifically, we sought to understand the following: 1) In what ways does parenting impact parental activity spaces? 2) What other forces shape parental activity spaces? Our goal is to further our understanding of activity spaces among parents to better assess the role of environmental exposures on parenting behaviors and potentially guide place-based prevention and intervention efforts.

## Method

### Sample

**Selection of Study Sites**—A purposive sample of four cities was selected from a list of 16 non-contiguous cities in California with wide variation in population characteristics that were located within 60 miles of the first author's research institution. The four selected cities (Fairfield, San Rafael, Milpitas, and Sunnyvale) ranged in population between approximately 60,000 (San Rafael) and 140,000 (Sunnyvale) according to the 2010 census (Census.gov n.d.).

**Sampling of Participants**—Participants were recruited from these four cities via purposive sampling which aimed to maximize the variability of respondents by race or ethnic groups, genders, age groups, and drinking patterns. The inclusion criteria for the study included: a) living in one of the four study cities; b) being a parent or legal guardian of a child aged 10 or younger; and c) living with that child at least 50% of the time. To recruit

participants from these communities, advertisements were placed in the local jobs section of Craigslist.org (an online classifieds page) and on Facebook.com. To increase the reach of recruitment and attempt to contact those without online access, flyers were additionally posted at local places frequented by individuals with children (e.g. public libraries). Interested individuals were asked to call or email the study interviewer, who proceeded to screen for eligibility via the telephone or an online data collection form. Those who were eligible were scheduled for an interview. While some of the interviews took place at a participant's home or workplace, most were conducted in public places such as coffee shops or parks. The interviewer described the interview questions both during the screening process and before beginning the interview to ensure that participants were comfortable answering the study questions in the selected interview location. Participants received a \$50 cash incentive fee for their participation.

The study sample included 60 individuals. After completion of the interviews, it was discovered that three participants did not live within the legal limits of one of the four cities. Since all three individuals lived very close to the border of a sampled city, spent the majority of their time within that city, and did not live in one of the other cities in the sample, we retained them in the sample, leaving 15 participants per city area. The demographic characteristics of the sample are presented in Table 1.

## Procedures

**Interview Protocol**—Prior to commencing the interview, the study interviewer asked each participant to read an informed consent document, reviewed the details with the participant, and answered any questions. A waiver of signed informed consent was obtained from the grantee institution's IRB [Blinded for review]. Interviews were digitally recorded. The questions examining activity spaces were based on the Ecological Interview (Mason et al. 2004), which uses the method of "free listing". In this process, participants were asked to list their activities and locations over the course of a day, week, and month in sequential order. These data consequently represent a census of locations each participant utilized during these time frames. Questions about where parents spent time were followed up with open-ended questions about parenting in those places.

**Data Analysis**—Data from the semi-structured interviews were coded in order to create activity spaces and to code qualitative themes. 1) *Coding of Qualitative Themes*. A master's level research assistant and PhD level researcher developed themes and coded the qualitative data. Before coding commenced, an initial a priori coding scheme was developed based on the study aims and theoretical interests (e.g. activity spaces). These a priori codes were supplemented with thematic codes developed during an inductive data analysis process and guided by a critical realist epistemology (Braun and Clarke 2006). Coders met regularly to establish consensus around themes. In addition, the interview used member checks to ascertain the face validity of themes throughout the data collection process (Creswell and Miller 2000). Once the finalized coding structure was developed, 20% of the dataset was double-coded, with inter-rater reliability ranging between .70 and .90 (Landis and Koch 1977).

2) *Coding of Activity Spaces*. Two research assistants used the qualitative data to construct in-depth activity spaces. Each coder began the process by reading through each transcript. Coders would note and highlight any references to places or locations visited, as well as address or descriptive information that would assist in geocoding. Coders also noted the type of location (e.g. home, work, grocery store), the frequency with which each location was visited (e.g. daily, weekly, once a month), and the social context and drinking behaviors at each site. These codes were then entered into an SPSS version 21 database (IBM Corp. 2012). The research team met frequently to assess and resolve any coding discrepancies. To ensure reliability, fifty percent of the transcripts were double-coded by both research assistants.

A total of 1,502 routine locations were coded from the 60 transcripts. Routine activity space locations were defined as locations typically visited at least once a month and within the past month; important social network locations were also included (Browning and Soller 2014). Of those locations, 1,319 (88%) were successfully geocoded to the street address or nearest intersection. Of the 183 locations that were not geocoded, 33 had some but not all street address information provided, while 123 had only city or state information provided. Missing location information typically occurred when respondents either could not fully remember or refused to disclose more specific information.

3) *Mapping of Activity Spaces*. For each parent, we used Geospatial Modeling Environment (Version 0.7.3; Beyer 2014) to construct minimum convex polygons from a set of routine point locations that were both reported by the parent and successfully geocoded. Utilizing themes from the qualitative coding, we defined child-centric spaces as routine locations designed to meet a child's needs (e.g., child care, parks, toy stores) and adult-centric spaces as routine locations designed to meet a parent's needs and where children were typically less welcome (e.g., work, bars/nightclubs).

## Results

We used qualitative data from semi-structured interviews to examine the forces that shape activity spaces for parents. The resulting themes reveal the role of specific places in parent lives. Some places were viewed as either child-centric or a point of escape from childcare duties, while others were reserved exclusively for weekends. In addition, themes suggest several factors that both constricted and expanded parent activity spaces, including their role in the family household, age of children, and income. These data suggest that parenting roles and duties play a notable role in the places that parents go.

### Theme 1 Child-Centric Places

Parenthood influenced both how far parents traveled and the types of places they went. When discussing the meaning of the different places they frequented, parents classified many places as exclusively for their children. While some places, such as amusement parks or swimming pools were described as pleasurable for the whole family, child-centric places were often perceived as boring or unstimulating to parents.

My daughter really loves the Tech Museum in San Jose. She really loves it. And to me it's boring. But she thinks it's wonderful. She loves every bit of it. We go there a lot.... My wife will take a book. And I'll just, uh... Well, I got everything on my phone so I'll just take some earplugs and follow her around and make sure everything's going okay. (Man, Sunnyvale, ID1043)

Again, parenting was cited as significantly changing the places where parents go, with the desires of the children often placed before the interests of parents.

Once you become a parent you don't have much anything else but parks and... bookstores. So, any bookstores when we're around this side of town, we, um, there's a really big one, um, it's all the way down north when we come here sometimes, we'll take a trip over there maybe once every three months or so... And they love that one, I don't know why. It has a big kids section with reading tables. They really can spend all day there. (Woman, Sunnyvale, ID1048)

## Theme 2: "Adults-Only"- Places of Escape from Parenting

Just as parenting demands shaped where parents go, some parents have designated places that they go for reprieve from parenting duties. For some, the workplace was seen as a place where parents were unburdened by child needs.

Whenever-whatever chance I get, I will work from home, but to be honest with you, I actually enjoy going to the office 'cause I-I want to interact with other adults, you know, which is so nice. I can actually have fun conversations, you know. I learn a lot. I actually enjoy it, now more than working from home. I don't know why. I know it can be quite a distance driving. I don't mind 'cause I enjoy driving. It relaxes me, just as long as, I can fit it all into my schedule. (Woman, San Rafael, ID1014)

Other parents sought out spaces completely outside their home or work duties for escape. For some, these were places where parents engaged in a specific activity, such as a hobby.

I like my alone time. I like my fishing time. I feel like when I go fishing there's nothing that can be said. Because I've earned that time. And I wanna keep feeling like I can go fishing whenever I want... You go to work and you come home and whine to me about how your day was and how your boss did this and did that and how you sat on your butt all day. No problem. I'll be there for you. But Saturday I won't. [LAUGH] I'll be gone. Pulling fish out of the water. (Man, Sunnyvale, ID1043)

Other parents sought escape in a variety of places, such as bars or gyms. These places provided a break from meeting demands of either the workplace or home. While both men and women described places of escape from parenting, the theme appeared particularly relevant for fathers.

I'm a big fan of happy hour and the thing is um, the transition from work to home is usually something that is helped if I take a break. Doesn't have to be a drink. Could be the gym. Could be whatever. But, I tend to feel that's a useful thing for

me so that um I can focus... so that would be the reason. It's just personal time.  
(Man, Milpitas, ID1049)

When asked to describe what his favorite bar meant to him, one father noted,

Um, you know, you can come, curse like a sailor. You don't have to watch your mouth because of kids. You know you can talk about the game, you can talk, talk trash when the, the football season, baseball season, basketball seasons is underway, you know. Um and also it's you meet other people who have kids [that you] never really have time for any more so... It's kind of like a no kids zone.  
(Man, San Rafael, ID1012)

### Theme 3: Weekend vs. Weekday Places

When describing their activity spaces, parents often noted that the type and number of places they went to differed significant between weekdays and weekends. While some parents reported using the weekends to relax by staying close to home, many parents used weekends to travel farther than on weekdays, by going on family day-trips or to visit family and friends living in other parts of the greater Bay Area.

Um, I think, you know, we try to expose our kids to as much different stuff. Living in the Bay area, it's a lot different than where we were before so... There was a lot less to do so it was like, oh, we can go to that park and that other thing that we do. And here it's like, oh, we can do something totally different every single weekend like let's show them this and let's take them on a ferry boat and let's, you know, take them to Berkley or Oakland or, you know, wherever. And we definitely go further on the weekends than we would during the week which I think pretty much during the week it's like a ten-mile radius right around here. (Woman, San Rafael, ID1022)

For some primary caregivers, weekends provided a change from the usual routine activities with children. For example, one mother described how having her husband home on the weekends made her more interested in traveling to new or far afield places,

But on the weekends that's usually when we do stuff because everybody's off. Even though I don't work, I still look forward to the weekends because I can do more things with the family. 'Cause I can't do as much when it's just me and [my daughter], I don't go as far. If it's just me or [my daughter] I think of the-the common sense of it and the dynamics. I gotta think about traffic coming back unless there's three of us, I'm not gonna be in carpool lane...[LAUGH]...And if she doesn't have a nap and she has a nap in a car, she's gonna be fussy the rest of the day. (Woman, Fairfield, ID1031)

Since weekends were less routinized than weekdays, parents may experience much more variability in their activity spaces from weekend to weekend than in their usual weekday activities.

#### Theme 4: Role in Family Household

Some participants described having clear-cut roles in their household division of labor. These family household roles shaped the places that they went as well as how much time they spent with children. Parents who were the primary caregiver described themselves (or were described by their partner) as having more of their activities related to childcare or their children's activities. These duties were sometimes viewed as greatly circumscribing what parents did, and occasionally their opportunities for employment.

I mean she takes care of most things. Right now she's not working. It's a little problematic economically but that gives her all the time. Now the economy has gotten bad and we had some investments that went "kapooey" and so now it would be nice if she at least had a part time job, but she has to run around, you know, picking her up [daughter] and taking her home. (Man, Sunnyvale, ID1044)

While many primary caregivers described being pleased to spend more time with their children, these roles were occasional sources of conflict, particularly when one parent was viewed to cross boundaries between spaces that were "owned" by one parent due to the family division of labor.

I mean, he works a lot. He works in the city and works crazy hours, and, so, you know... we sort of occupy separate spheres, like he does the work thing... sometimes he does come home and get picky about things at home and I'm like, dude, back off. You're the boss at work and in your job and your life. But like, I'm kinda the boss of all of this stuff. (Woman, San Rafael, ID 1013)

Although being the primary caregiver did not necessarily constrain the size of activity spaces, as many primary caregivers traveled significant distances, it did impact the types of places that parents went, with primary caregivers describing spending more time running household errands, dropping or picking up children, and ferrying them between child-oriented activities. The activity spaces of primary caregivers were consequently described as linked to that of their children in contrast to other parents (particularly those who worked full-time) whose activity spaces were shaped around work or commuting needs. One father (who was not the primary caregiver) noted about his recent travels, "It's been pretty much strictly to work and back... I mean, our typical, our main (place) for grocery shopping is down here in town, and my wife's been doing more of that now that I'm back in a work environment" (Man, San Rafael, ID1060). Although many of those who identified as primary caregivers were women, some men also took on that role, and there were no apparent gender differences in how parents described ways in which being a primary caregiver (or not) impacted their activity spaces.

#### Theme 5: Age of Children

In addition to the role in family household, parents cited the age of their children as a significant force that guided their activities. This was particularly evident with parents of newborns, where parenting was described as an all-consuming task due to the high needs of infants. The biological need to nurse was also noted as closely linking breastfeeding mothers to their children. When asked if she had recently gone out for the night without her child, one mother answered,

I can't. I can't because I breast-feed her. And so especially at night she needs me so much. So right now (she's) too young. I say I don't have a life outside. I don't go out... There's no separation [LAUGHS] at night between her (and me). (Woman, Fairfield, ID1032)

Parents of young toddlers also described that children limited their activities.

Honestly, we don't really go out that often... when we do, we have to bring (my son) with us, uh, most of the time. And-and it's hard-it's hard to bring him because he's kind of a very active child and um, he can only stay in one spot like... I'm lucky if I get through going grocery shopping without him, getting upset. (Woman, Sunnyvale, ID 1009)

For some new parents, these restrictions on activities were experienced as negative, with parents longing for escape from childcare duties. One new father of a newborn noted,

So for instance right now, I've, you know, I've got less on my plate than I did, say a year ago. Which is kind of why I ended up being, you know, at least for now the primary caretaker during the week... And it was like argh, you know, like there-there's a threshold I think where it goes from being like fun and bonding to just being like slavery. (Man, San Rafael, ID1023)

Yet while younger children were seen as barriers to activities, older children were reported as expanding activity spaces, as parents drove children to schools, lessons, or playdates. Some parents drove great distances to ensure that their children attended a preferred school or activity.

Yeah and he's been playing foot-his dad-his dad actually lives (two cities away) so that's the reason why he plays football there. I've tried to get him to play on a team closer, but he likes his friends and everything so he's been playing for four years, so that's the reason why we go way over there for-but I mean it doesn't even matter even if he did play closer because their games are always way out. (Woman, Milpitas, ID1037)

Parents consistently described willingness to travel farther in order to meet the needs of older children, while the needs of younger children were seen as centering on the home environment. For example, Figure 1 provides an example of how the activity spaces of mothers with similar levels of income and residing in the same city can differ by age of their child(ren). Map (a) shows the a much larger activity space of a mother with school-age children compared to the much smaller activity space of a mother with a newborn child in map (b). This figure highlights how very young children can have a significant impact on the mobility of mothers outside their residential neighborhoods.

### Theme 6: Income as Conscribing Spaces

Many parents reported that the number and types of places that they went were conscribed by their income. Somewhat surprisingly, this theme was seen in many high-income respondents as well, which is perhaps reflective of the high cost of living in the San Francisco Bay Area. Income was often described as limiting "adult-only" activities such as dates with a partner, suggesting that some parents prioritized "child-specific" activities or

spaces over “adult-only” ones. We asked whether he went on dates with his spouse, one man replied, “We’re pretty much homebodies for the most part. Because of my company that we’re starting you know, I don’t make a lot of money right now, so we don’t have enough to go out regularly” (Man, San Rafael, ID1050). The maps shown in Figure 2 show how child and adult centric can differ by income for male respondents with school-age children who reside in the same city. The low-income, male respondent shows much smaller and geographically focused activity spaces for both child and adult centric activities compared to the high-income, male respondent. For both male respondents, child activities were limited to taking the child to school and parks. However, the park locations were more geographically dispersed and varied for the high-income respondent. Adult spaces varied where the high-income, male respondent focused adult activities around work and restaurant/bar locations across a more geographically disperse area while the low-income, male focused adult activities around work and friend's homes around a more geographically focused area.

Parents who did not own or have access to a car also reported that their activity spaces were much smaller as a result. This impacted their ability to conduct daily activities as well as severely limited leisure travel with children. When asked if he had recently traveled to other places in the Bay Area, one father replied,

No, not recently. Cause I don’t have a car no more. So that’s the only reason I don’t really go out. We used to go out to Vallejo... San Francisco and San Mateo like the fair and all that. We used to take my kids out there cause, you know, they never been out there. So I was like... I always like taking them out of town. (Man, Fairfield, ID1047)

While income was generally described as limiting or constricting activity spaces (see Figure 2), a few parents described how the need for higher incomes caused them to travel great distances. For example, one father commuted over 3 hours a day to work at a high-paying union job. This significant commute meant that while the size of his activity space was significant, the diversity of places that he visited was rather small.

## Discussion

We examined holistic representations of parental activity spaces through the use of ecological interviewing. As a result, we are able to examine both geocoded maps and qualitative assessments of parent activity spaces. These maps and qualitative themes suggest that several forces – those specific to parenting (e.g. age of child) and other factors (e.g. income, weekday vs. weekend) – shape parental activity spaces. In addition, we developed themes about how parents classified the places that they go (e.g. child centric vs. adult centric). These findings highlight the complex interplay of factors that are associated with the places parents go, and offer glimpses into potential research and intervention avenues to modify parent behaviors, which could in turn positively impact the long-term health and well-being of children.

Parents described a number of factors that shape their activity spaces, including their caregiving status, the age of their children, and income. These findings are similar to others

in the literature suggesting that parental characteristics and income are associated with the size of activity spaces (Kawase 1999; Kazmuzzran and Hine 2012) and indicate that low-income parents, primary caregivers, and parents of very young children may inhabit spaces close to their residential neighborhood. As initial research suggests that smaller activity spaces may be associated with negative parenting behaviors (Freisthler et al. 2015), our findings also suggest that further research should examine whether low-income parents, primary caregivers, and parents of young children have greater risk of negative family outcomes due to conscribed activity spaces, as well as if this is particularly true for parents living in disadvantaged neighborhoods.

While more research is necessary to understand whether our findings are applicable to different neighborhood contexts (i.e. highly urban or frontier areas), they suggest that interventions or programs designed for these parents should pay careful attention to place. For example, an intervention designed to provide parenting skills to low-income parents might involve home visits or the provision of a mobile van at child-centric places (such as parks or libraries) that are located within the neighborhoods where parents live. In contrast, our research suggests that interventions or research interested in parents with higher incomes, older children, and or non-primary caregivers might focus on activity spaces instead of residential neighborhoods. These parents may be better reached by place-based interventions based on their workplace or adult-centric spaces.

Similar to Kamruzzaman & Hine (2012), we found that parents described their activity spaces as differing substantially between weekdays and weekends, with weekday travels being more regular and routine than weekend excursions. This was witnessed more often among middle and higher income parents than among low income parents, who described smaller activity spaces overall (particularly those without vehicles). Thus parents may have periodic exposure to environmental risks and resources areas that may not be assessed by examination of routine activity spaces. Indeed, understanding the recent spatial context of parenting behaviors (e.g. where a parent was when a specific behavior occurs) may provide important information about how ecological factors are associated with parenting behaviors. Few studies, however, examine the role of place in these relationships, potentially missing key influences in the community environment.

Like all qualitative analyses, this study cannot be viewed as generalizable beyond the current convenience sample. However, we do believe that our findings suggest several opportunities for future work. First, our results indicate that parental exposures to the community environment may vary considerably between individuals and are linked to characteristics of the child, parent, and family. We also identify potential factors such as age of child, income, and caregiver status that may impact activity spaces and should be considered in larger-scale examinations of activity spaces among parents. Finally, we provide an initial understanding of the nuanced ways that activity spaces may differ between times (weekends vs. weekdays) and places (adult-only vs. child-specific places). Knowing how to best capture and study activity spaces among parents could allow for individualized and specific measurement of community exposures as well as more sophisticated understanding of interactions between the size of activity spaces and the qualities of the residential environment. This knowledge could in turn help identify the mechanisms by

which environmental factors influence parenting behaviors and the consequent health and well-being of children.

## Acknowledgments

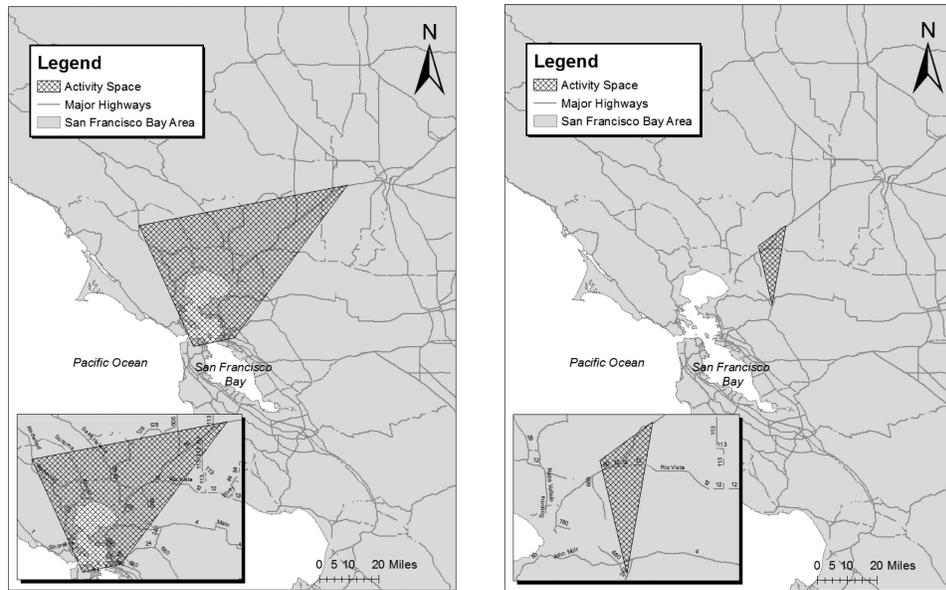
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## References

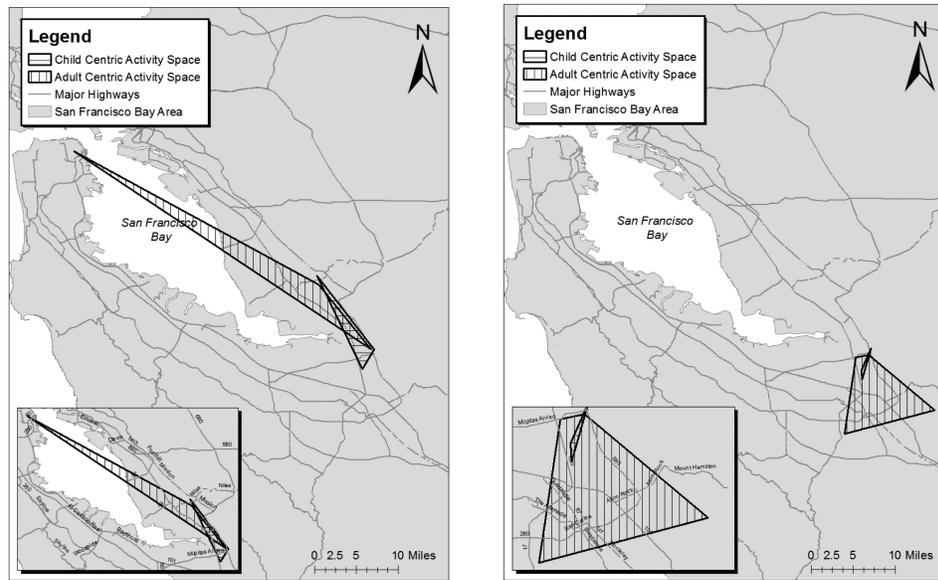
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**Figure 1.**  
 Routine activity spaces of a middle-income woman with older children (a) and a middle income woman with a newborn (b) from the same city  
 (a) Middle Income, Woman Respondent with Older Children  
 (b) Middle Income, Woman Respondent with Newborn



**Figure 2.**  
Routine activity space of a high income (a) and a low income (b) male respondent from one city  
(a) High Income, Male Respondent  
(b) Low Income, Male Respondent

**Table 1**

Demographic characteristics of sample by city and overall

	Fairfield n	San Rafael n	Milpitas n	Sunnyvale n	Overall n (%)
<i>Gender</i>					
Male	7	8	7	8	30 (50)
Female	8	7	8	7	30 (50)
<i>Race/Ethnicity</i>					
White, non-Hispanic	4	9	4	6	23 (38)
African American	3	1	2	2	8 (13)
Asian or Pacific Islander	4	2	4	4	14 (23)
American Indian or Alaska Native	1	0	0	0	1 (2)
Latino	3	2	4	2	11 (18)
Other	0	1	1	1	3 (5)
<i>Marital Status*</i>					
Married	8	13	4	10	35 (58)
Divorced	2	0	5	1	8 (13)
Separated	1	0	0	0	1 (2)
Never Married	3	0	1	2	6 (10)
A Member of an Unmarried Couple	1	2	5	2	10 (17)
<i>Annual Household Income</i>					
Less than \$10,000	4	0	2	0	6 (10)
\$10,000 to less than \$15,000	0	0	0	1	1 (2)
\$15,000 to less than \$20,000	1	0	0	0	1 (2)
\$20,000 to less than \$25,000	1	0	2	0	3 (5)
\$25,000 to less than \$35,000	3	1	4	0	8 (13)
\$35,000 to less than \$50,000	2	2	1	3	8 (13)
\$50,000 to less than \$75,000	0	1	3	1	5 (8)
\$75,000 to less than \$100,000	2	4	1	5	12 (20)
\$100,000 or more	3	7	3	5	16 (27)

	Fairfield n	San Rafael n	Milpitas n	Sunnyvale n	Overall n (%)
<i>Education Level*</i>					
Grade 12 or GED	4	0	3	1	8 (13)
Some technical school	1	0	0	0	1 (2)
Technical school	2	0	0	1	3 (5)
Some college	5	1	5	5	16 (27)
College graduate	1	10	7	6	24 (40)
Post grad. or professional degree	2	4	0	2	8 (13)
<i>Employment Status</i>					
Full-time (32hrs+)	4	10	5	8	27 (45)
Part-time	1	0	3	2	6 (10)
Self-employed	0	2	3	1	6 (10)
Out of work for less than 1 yr.	4	0	1	0	5 (8)
Homemaker	2	3	1	2	8 (13)
Student	3	0	1	1	5 (8)
Unable to work	1	0	1	1	3 (5)

\* p<.05