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There's No Place Like Home: How Residential Attributes
Affect Family Functioning

Carly M. Thornock

A thesis submitted to the faculty of
Brigham Young University
in partial fulfillment of the requirements for the degree of
Master of Science

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ABSTRACT

There's No Place Like Home: How Residential Attributes Affect Family Functioning

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The purpose of this study was to examine the ways in which actual (e.g., density and openness) and perceptual (e.g., crowding and distance) elements of the spatial home environment act as predictors of family functioning. Data were gathered from 126 families whose child was attending a university's preschool/kindergarten facility in a mid-sized community in the Western United States. Structural equation modeling (SEM, AMOS 19.0) was employed to examine the strength of the relationships within the model. Results showed that though actual home items (specifically density and great room openness) affect family functioning outcomes, perceived crowding was especially influential as a mediational variable. Findings suggest that how one perceives his or her home environment has more of an effect on family functioning than actual home characteristics.

Keywords: family functioning, crowding, openness, density, home, space

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Introduction

According to a study of 170 families over the course of a year, mothers, fathers, and infants spend an average of 18.4 (76.7%), 14.7 (61.3%) and 19.3 (80.4%) hours per day in the home, respectively, making the home the primary place where family members spend their time (Farrow, Taylor, & Golding, 2010). Given the amount of time spent in the home, it seems important to understand the ways in which the physical environment influences the people who live there and the processes that occur there. The home has been studied for decades in terms of its social atmosphere (i.e., marital conflict, parenting, routines, housework, etc.) and as a canvas for architecture and interior design (i.e., construction, aesthetic combinations, color, etc.). However, the scholastic intersection of the two fields of architecture/design and family studies is underdeveloped. Indeed, Evans (2006) called for the need to further understand the “underlying mechanisms [that] account for developmental impacts of the physical environment on human behavior” (p.439). Environmental psychologists have tapped into how individuals, specifically children, react (i.e., learning and behavioral outcomes) to issues such as crowding and noise within the home, though the research is sparse regarding how spatial/design elements influence family functioning. Indeed, there is a paucity of work examining the association between physical characteristics of the home (both actual and perceived) and family processes. Therefore, the purpose of this study is to explore how environmental factors, both actual and perceived, are related to the way family members interact with one another.

Theoretical Background

The present study is grounded in five primary theories originating from both design and social science fields of study. These work to form a cohesive foundation upon which this study is based.

Space Syntax

First, a movement in architectural literature known as space syntax theory assumes that spaces represent the social life surrounding and penetrating them (Bafna, 2003; Hillier & Hanson, 1984). A main goal of space syntax theory is to “accurately describe the dynamism of social life in spaces” (p. 23). In other words, this theory aims to describe how social life ebbs and flows in specific spaces. Hillier and Hanson (1984) proposed that a person’s surrounding space has a close relationship with his or her behaviors, that aspects of personal and family life infiltrate space and are even defined by space.

Though closely interrelated, three key concepts illustrate space syntax theory – *integration, depth, and choice*. *Integration* suggests that public spaces are used more often and usually occupy more central territories than private spaces. For example, a hotel lobby is often in the central/frontal portion of a hotel and public access is frequent and relatively easy. In relation to the home, the yard, foyer, and gathering areas of the home are the most public and accessible, while bedrooms tend to be receded further into the home and are considered private areas. *Depth* refers to the concept that the deeper a territory is situated within a space, the more private and intimate the space. For instance, a master bedroom is an intimate place usually situated beyond a semi-public space such as a hallway, which is situated beyond a public space such as a family room, which itself is situated beyond the greater public barrier of the front door. Finally, *choice* refers to the notion that as space progresses in depth and turns, human-spatial

interactions will diminish because humans likely will have chosen to interact in a previous point along the physical path. For example, people will likely stop in spaces they encounter early upon entering a home such as a family room or kitchen area, but few will continue to wander toward bedrooms and closets in the rear of a home without a specific purpose. In sum, integration explains public versus private space, depth refers to shallow versus deep space, and choice determines if a space will likely be popular versus sparse. Together these three aspects define the social potential of space.

Space syntax theory highlights that the existence of a central, accessible, more public territory in the home will attract family members and guests more frequently than spaces that are tucked away in architecturally deep segments of the home. Members are more likely to stop and linger in “public” spaces of the home if these public, accessible spaces exist. Because these open spaces are prospectively more popular than private areas recessed into the home, family members may find themselves together more often which might facilitate family interactions. However, the extent to which these interactions are positive or negative might be affected by the physical features of the space including its size (i.e., smaller space might lead to feelings of crowding).

Affordances

The second theoretical foundation falls within the field of study known as environment stimulated behavior. The framework of *environmental affordances* describes how an environment (i.e., a home) provides or affords many opportunities for either positive or negative interactions and processes related to both individual and relational development within that setting (Gibson, 1977; Miller, Shim, & Holden, 1998). Affordances are the behaviors that a space or item allows one to execute. For instance, a stove affords cooking, a chair affords sitting,

and large, frequented rooms afford gathering. This theory, first coined as “action possibilities” by Gibson (1977), has been used to describe how design suggests interactive qualities of an object (Norman, 1988). Rapoport (1990) makes an important distinction; he describes an affording environment as being potentially facilitative of behavior but not necessarily determinative. In other words, one may not choose to sit in a chair, but the affordance of sitting is present. Despite the home being one of the primary environments for family interaction, little research has examined how variations in home affordances might be linked to how families interact with their home environment. Affordance theory would underscore the point that if a house provides the opportunity for certain actions, habits, or behaviors, these opportunities will be taken more often than if the home does not provide for such experiences (Wachs, 2000). For instance, the openness of a home may afford increased family contact and togetherness-fostering interactions that the family can utilize to its benefit.

Optimal Stimulation

The third theory that explicates ways in which space defines social interactions and impacts human development is the *optimal stimulation model*. This model postulates that human functioning is affected by environmental stimulation. If stimulation levels are too low or too high, people respond negatively, but an optimal level of stimulation allows for healthy growth, affect, performance, and health (Evans & Cohen, 1987). Extreme (either too intense or too boring) environmental elements lead to human stress responses. Environmental elements that have been shown to cause such stress responses are noise, crowding, change, and ambiguity (Cohen, Evans, Krantz, Stokols, & Kelly, 1981; Evans & Cohen, 1987; Kaminoff & Proshansky, 1982; Wohlwill, 1974). An abundance of these stressful environmental factors has the potential to harm familial relationships. However, when a home mediates the effects of stressful

environmental harms (e.g., allowing room for each family member in common gathering areas, providing permanence for a substantial amount of time, employing materials that require a reasonable amount of upkeep, keeping costs within budget), family functioning and behavior are more able to thrive. In other words, the home has the potential to afford stressful or positive family interaction.

Ecological Systems

Fourth, Bronfenbrenner's (1979, 1989, 1999) ecological systems theory further reinforces the human-environmental connection. Ecological systems theory states that individuals are developmentally influenced by the psychological, relational, and/or physical surroundings that they encounter. Specifically, the most direct influence is the *microsystem*, which includes the direct contextual environment (i.e., the immediate setting in which the child resides such as the family, classroom, or home). The subsequent layers of influences include the *mesosystem*, which describes the interaction of two or more microsystems of which one is an immediate member (e.g., parent-teacher conference); the *exosystem*, which comprises the indirect spheres of influence on an individual (i.e., parent workplace, school administration), and the *macrosystem*, which describes larger socio-cultural influences.

Of particular relevance to the current study is the role that the home plays as a microsystem specifically examining the connections between the home and the family. While there is a significant amount of research examining the family as an important microsystem itself, the family can potentially also be viewed as the target organism. Thus, the residential environment in which the family functions a great majority of the time (i.e., the home) may be explored as to how it may contribute or detract from family life as a microsystem. Researchers have reinforced that the microsystemic influence of the surrounding physical environment (i.e.,

school, home, playground) has significant effects on human behavior (Johnson, 2010; Miller, Shim, & Holden, 1998; Regoeczi, 2003). Because of its close proximity and ever-present characteristic, other researchers have noted that the home indeed fits the classification of a micro-context affecting the target organism (Proshansky, 1978). Ecological systems theory illustrates that the home, as a close and influential environmental context to family life, can be instrumental in constructing family relationships yet little empirical work has been done to specifically examine these possibilities.

Place Attachment

Finally, a family cyclically defines and is defined by their residential space. As this occurs, a form of attachment develops. Place attachment, or the nature of the bond one may have with a social and physical place, is influenced by a myriad of factors, including personal characteristics of residents/inhabitants; availability of facilities, opportunities, and resources; and sense of belonging (Brown & Perkins, 1992; Popay, Thomas, Williams, Bennett, Getrell, & Bostock, 2003). We form attachments to places that support and define who we are and give us a sense of belonging. Again, place attachment encompasses the social aspects of place as well, which may make the family itself as much part of a home as the physical structure.

The home is a primary space for familial interaction, as outlined in ecological systems theory (Bronfenbrenner, 1977, 1999; Farrow, Taylor, & Golding, 2010; Kopec, 2006). Thus, in the home context, place-oriented meaning forms as relationships develop (Proshansky, Fabian, & Kaminoff, 1983). The meaning that people associate with spaces, especially their homes, is important to family life because space has the potential to shape lives and identities (Popay et al., 2003; Proshansky, Fabian, & Kaminoff, 1983). Home environments may also assist in routine and life structure, and protect those within it. Within the family, places can be a constant

reminder of things that would rather be forgotten, or they can be supportive and reminiscent of healthy, uplifting relationships. Identifying with place (Proshansky, Fabian, & Kaminoff, 1983) serves two purposes: to define an individual or group (e.g., the family) and to protect inhabitants from identity-threatening settings, properties, and people. This perspective purports that it is important to feel that the place where family interactions take place define family identity, protects the family, supports healthy meaning development, and is functional. Thus, the home has the potential to become a support system for the family. This is important to understand because when a home is not meeting the needs of its inhabitants, family relationships are at risk of suffering. Intuitively, one of the primary purposes of the residential environment is to support its inhabitants (Lawton, 1989). Indeed, “the home environment can be considered in terms of its capacity to nurture and sustain psychological and social processes” (Lawrence, 1987, p. 130).

Summary of Theories

In summary, the present study aims to highlight the important interactions of families within their surrounding environment. Space syntax theory indicates that a person’s surrounding environment, and thus the home, shapes and reflects behaviors. Affordances allow certain behaviors to be enacted in qualifying environments; the home may afford family-oriented behaviors or encourage separation. Both the optimal stimulation model and place attachment reinforce that an environment can be stimulating and supportive to its occupants, though sometimes the environment can also impact residents for the worse. Ecological systems theory establishes the importance of the home in shaping the development of individuals and relationships. Together, the space syntax theory, affordances, the optimal stimulation model, ecological systems theory, and place attachment work to lay the foundation of the potential effect of the physical home environment on family functioning.

Empirical Foundations

The environment affects us in physical and even emotional ways. For instance, it is not uncommon for various environmental forms (e.g., natural scenes, architectural phenomenons, sculptural pieces) to elicit an emotional response (Dazkir & Read, 2012). Indeed, surroundings have the propensity to affect us above and beyond our social interactions that happen in the environment (Wachs, 1990; Zelenski & Nisbet, 2012).

Recently, scholars have looked into the role of the home environment as a social and physical construct. Using the Confusion, Hubbub, and Order Scale (CHAOS) to assess the home environment (Matheny, Wachs, Ludwig, & Phillips, 1995; Shamama-tus-Sabah & Gillani, 2011), researchers have determined that household chaos (i.e., environmental confusion, ambient noise, crowding, commotion, and untidiness) is linked to child conduct problems, decreased study and social skills, (Shamama-tus-Sabah & Gillani, 2011), family cooperation issues (e.g., decision making; Dumas et al., 2010), and increased authoritarian parenting (Coldwell, Pike, & Dunn, 2006). Although it is important to examine how confusion, noise, commotion, and clutter might impact individuals within families and family functioning, these factors still do not address the role that the spatial elements of the home plays. For example, noise and clutter are some things that occur in the home but are not inherent in the physical structure of the home that dictates available space. Further, the CHAOS scale does not assess residents' perceptions of their home environment, which may also affect the way people behave in certain spaces beyond the impact of the actual features of the home. Thus, it is important to assess how spatial aspects of the home, both actual and perceived, impact residents' behaviors, specifically family functioning.

Spatial Features of the Home

Density. Density is a common factor used in describing spatial needs of individuals and families. Size and density of a home are similar, though they address slightly different issues. Home size generally is measured in square foot increments and is a measure that remains constant regardless of occupant load. Density, however, is a measure of the ratio of individuals to an area (usually square feet). A measure of density is helpful to consider in lieu of a strict square footage analysis since the home environment as a whole is dynamic, varying according not only in size but in occupant load and activity levels.

Researchers have shown that density tends to impact the individuals within a given space. Density has been found to be correlated with physiological arousal and stress, being manifest in areas such as elevated heart rate, blood pressure, skin conductance, mood change, and aggressive tendencies (McAndrew, 1993). Animals have also exhibited the same sort of responses (stress, behavioral disorientation) to high-density situations (Calhoun, 1971). From these studies it seems that density has the potential to contribute to individual and potentially familial health and well-being. However, few if any studies have examined the ways in which density may be associated with family processes. Therefore, the first purpose of this study is to evaluate the links between home density and family functioning.

Openness. Spatial openness is a multifaceted aspect of the home environment. Within the home, important dimensions of openness include the extent to which residential space is (a) homogenous versus differentiated, and (b) open versus closed (Altman & Chemers, 1980). The dimensions homogenous versus differentiated describe space as open and unspecific in usage (homogenous), or characterized by separate and distinct nooks, rooms, and spaces for individual specific tasks (differentiated). People have utilized homogeneity and differentiation of space to

meet their needs throughout history. Originally, a single room accommodated eating, sleeping, socializing, and recreating because residents only had single room homes. In recent years, homogenous layouts are again popular especially within the kitchen-dining-living area of the home, where eating, studying, recreating, practicing, entertaining, worshipping, working, and other activities are accommodated. This arrangement is known as the *great room* and is used in present times intentionally instead of being necessity-driven (Kopec, 2006). The juxtaposition of homogeneity and differentiation within the contemporary home is unique to the late 1990's and on, as it incorporates elements of both homogeneity (with the great room) paired with differentiation (in bedroom and bathroom separation, built-in nooks stemming from the great room, etc.). This style combination brings new benefits and problems, many of which have not been studied. The contemporary home spatial set-up may be facilitative or detrimental to family functioning.

The second set of home variables pertinent to the present study is that of openness versus closedness. With the existence of an open floor plan comes less explicit definition of space. An open interior plan (such as with a great room) commonly uses pillars, archways, and bars to separate spaces instead of full walls. These kinds of open spaces depend heavily upon psychological and social rules to prevent intrusion and protect space (e.g., when to be quiet), whereas closed interiors rely upon physical barriers to respect privacy and prevent intrusion (e.g., moats, locked doors, walls, electric fences). As current trends in American society seem to popularize the great room and open floor plan, the social and psychological "rules" of residential awareness may become a source of contention within the family if not explicitly defined.

The trend toward great rooms may have both positive and negative ramifications for families. On the one hand, it may be that family members are more exposed to the comings, goings, activities, and guests of other residents in more abundance than in times past. This could

be a good thing for family functioning. Family members may interact more with one another because they share space. They may be more aware of one another's schedules, interests, schooling, and friendships. If the open, communal space is managed with a rule-based system (e.g., no TV during dinner, 3:00-5:00 are homework hours), mother may benefit from being able to finish dinner preparations while also socializing with dinner guests, etc., without reaping the potential negative effects of unbounded spatial homogeneity and openness.

On the other hand, sharing space could present an interesting element of increased environmental stress. Families may struggle sharing space when one room (the great room) is the destination for a myriad of activities. For example, without intentional implementation of rules, mothers, fathers, and children may experience enhanced stress when they are forced to share space. If the kitchen (where mother is cooking dinner) is mere feet (without a wall, of course) from active video gaming, which is across the room from the computer and homework area needed by another child, and all of these stations surround couches and socializing space used by other members of the family to associate with guests, it is not hard to imagine how stress and conflict may develop.

Given the potential for home openness and homogeneity to impact family interactions both positively and negatively, this study seeks to explore the connection between home elements (including the great room floor plan) and family functioning. Specifically, the second purpose of the study is to examine the relations between home openness and family functioning.

Perceptions of Space in the Home

Although actual elements of the home are important elements in the present study, perceptual interpretations of the spatial home environment may similarly influence the family. Indeed, physical attributes of the residential environment are usually objective, yet how one feels

about those attributes may impact his/her attitudes and behavior to a greater extent than the physical feature itself. Specifically, crowding, and distance are two environmental factors that have the capacity for perceptual interpretation.

Crowding. Though density (i.e., ratio of people per square foot) itself may be impactful, researchers have found density-related stress responses to be a function of crowding (i.e., the perception of density) as well as actual density (Bell, Greene, Fisher, & Baum, 2001; Kopec, 2006). Crowding is described as the psychological counterpart to the physical condition of density. Environmental psychologists have given a name to the difference between the actual and the perceived environment; the geographical environment and behavioral environment represent objective and cognitive perceptions (in respective order) of one's surroundings. The geographical environment refers to the actual objects that surround someone, while the behavioral environment refers to the subjective evaluation of the geographical environment, which then forms the basis of behavior (Lang, 1987).

Although it is most certainly the case that the more people in an area, the more likely one is to feel crowded (e.g., Knowles, 1983), the perception of crowding may vary from person to person, and might be more important to individual and family well-being than actual density. Indeed, many hold the view that density and crowding are different variables, though others tend to use density and crowding measures interchangeably (Evans & Cohen, 1987; Maxwell, 2003), and still others argue that “perceived density is not highly related to actual density but is profoundly affected by landscaping, aesthetics, noise, and building type... Design can make an enormous difference to perceived density.” (Forsyth, 2003, p.4).

Illustrating the point that crowding might play more of a role in well-being than actual density, researchers found that prison crowding was related to psychological stress for inmates,

but prison density itself was not related to inmate distress (Baum, & Koman, 1976; Schaeffer, Baum, Paulus, & Gaes, 1988). Other studies have also demonstrated the difference between crowding and density. Womble and Studebaker (1981) found that people who prefer and expect high density situations are less likely to feel crowded. Some researchers have noted that shared environment (such as the home) can produce differing perceptions. In studying the behavioral environment, researchers have found that environmental perception seems to be a function of individual preference (Hanscombe, Haworth, Davis, Jaffee, & Plomin, 2010). In other words, one person could potentially look at a room and consider it crowded but another person might see the same room and not perceive a problem. Thus, considering the difference between the actual environment and perceptions of the environment, it is possible that families may react strongly to the perception of their home environment (too crowded, too roomy, too noisy) as a separate entity than the actual home itself (square footage/person ratio, number of bedrooms).

Given the variance in use of density and crowding measures, it seems important to take both actual density and perceived density (crowding) into consideration when exploring the effects of space on individual or family life (Rapoport, 1984) because it appears that crowding affects people in unique ways (Wachs & Camli, 1991). Crowding affects human functioning in people of all ages, though its effects are especially prominent in children (Baum & Davis, 1976; Evans, Lepore, & Schroeder, 1996; Evans, Maxwell, & Hart, 1999). Maxwell (1996, 2003) determined that children in high density (person to space ratio) homes and child-care centers have increased susceptibility to behavioral issues. Additionally, Maxwell (2003) found that children in situations where there is less space per person in classroom settings demonstrated poorer academic achievement (especially for girls), and classroom behavior (especially for boys). Further, a few studies have found correlations between residential density and school

achievement, potentially due to distraction when studying at home (Maxwell, 1996, 2003; Saegert, 1982).

Environmental effects continue beyond the individual and affect relationships as well. Illustrating this, Wachs and Camli (1991) found that crowding and “dynamic traffic patterns” (i.e., forming complex spatial segmentation and intricate traffic paths) are associated with lowered maternal involvement. In other words, feeling cluttered, or crowded, by furniture layout or crowding density discourages positive interactions between mother and child. This demonstrates the significance of environmental influences, in this case crowding, as a result of either limited space or unwisely organized furniture, on the way humans behave and socially interact.

The environment may be a “necessary but not sufficient” element directly related to family interaction patterns: without a supporting environment, family interactions may be less likely to happen. Further, when an environment works to cause stress and inhibit healthy family bonding, family togetherness may suffer. Therefore, given that the physical home has properties of affordance in size and openness, and that it may potentially facilitate positive family interactions, the third purpose of the current study is to explore the degree to which feelings of crowding influence family interactions and behaviors, and possibly define the relationship between actual elements of home space (e.g., density and openness) and family functioning.

Distance. Another perceived aspect of the spatial home environment is how distant one feels from family members in his or her space. In its extreme, distance (or isolation) has caused death (House, 2001). In medical patients, particularly those who are aged, isolation leads to hindered recovery and predicted mortality (Brummett et al., 2001). In most people’s reality, feeling isolated is related to a perceptual lack of interaction, perhaps due to low density. If

children are lacking familial interaction, socialization issues are expected to emerge (Zigler & Stevenson, 1993). For example, children have a hard time learning to behave in social situations when family interaction is sparse.

Perceived distance from family members within the home is not a well-researched topic. Some researchers mention the likelihood of distance being the antithesis to crowding. For instance, Gabe and Williams (1986) found that in really low density situations (when “density” is described as “crowding” in the study and also possibly a precursor for felt distance) women experienced decreased psychological health. For the present study, separation of the two constructs (e.g., crowding and felt distance) was deemed necessary in order to more fully examine how both aspects of family members’ perceptions may be linked to family interactions. Indeed, it may be that just as perceived crowding is problematic, so too may be space that spreads people out too far. For example, home size has been on the rise by a factor of three since 1950. Researchers have found that bigger may not be better when it comes to homes, especially in terms of energy use and quality (energy consumption increases and quality decreases, according to trends; Wilson & Boehland, 2005). Bigger may not be better for family functioning, either. Miller and Maxwell (2003) noted that larger home size has the potential to impair familial interaction. Although there is some evidence that crowding is definitely not ideal, it may be that a large square footage that spreads family members apart may not necessarily be a better choice for building family relationships. Because of the potential effects of feeling too spread out from family members within the home, the fourth purpose of this study is to examine how perceived distance from family within the home may influence family functioning.

Family Functioning

Family functioning is an umbrella term referring to family processes including parenting, family relation characteristics, emotional warmth, routines, rituals, and family roles (Fiese et al., 2002; Gorman-Smith, Henry, & Tolan, 2004). Healthy family functioning and connectedness is often characterized by a warm, cohesive interaction pattern. Healthy family functioning has been associated with a myriad of positive benefits. For instance, healthy family functioning has been shown to be a protective factor against child violence and problem behaviors in general (Hofferth & Sandberg, 2001; Gorman-Smith, Henry, & Tolan, 2004; LeBlanc, Self-Brown, Shephard, & Kelley, 2011), and a contributor to child exploration and creativity (Miller & Gerard, 1979). Family resiliency is encouraged by cooperation, support, and commitment to family members (Benzies & Mychasiuk, 2009; Place, Reynolds, Cousins, & O'Neill, 2002).

Based on work by Epstein, Baldwin, and Bishop, (1983), four elements of family functioning seem to be particularly relevant in examining family well-being including affective responsiveness, emotional expression, acceptance, and decision making. The first type of family functioning is affective responsiveness. Families that are strong in generating affective responsiveness, being the degree to which family members respond with “appropriate affect over a range of emotions,” tend to experience a heightened degree of family functioning (Epstein, Baldwin, & Bishop, 1983, p. 173). It has been found that as family members are more supportive and encouraging of one another, personal well-being levels and positive attitudes increase. For example, studies show that when parents are able to respond to their adolescent’s sad emotional experiences in a helpful manner, the adolescents frequently demonstrate accepting and grateful responses (Parra, Olsen, Buckholdt, Jobe-Shields, 2010). In another study, parental emotional support and positive affect were found to be protective factors against child substance

abuse in the family (Wills, Vaccaro, & McNamara, 1992). Furthermore, more positive influences on parent-child play opportunities and child behavior and development are found as social support increases (Dunst, Trivette, & Cross, 1986). Taken together, it appears that the way families react to one another when in the midst of varying emotional experiences is an important indicator of family functioning.

Second, emotional expression contributes to the whole of healthy family functioning. Specifically, families that are able to clearly understand and express feelings to one another seem to exhibit more positive functioning. Clear communication facilitates stability and mutuality in family units through the establishment of role reciprocity and clear boundary setting (Lederer & Jackson, 1968). Further, Schrodtt (2009) found family expressiveness to impact family strength and satisfaction significantly.

Third, familial acceptance is integral to family functioning because people have a natural need for positive response from people most important to them (i.e., family members), and this positive encouragement of family interactions cyclically encourages more interaction (Rohner, 1975, 2004). For example, parental acceptance has been found to contribute to adolescent adjustment (Kurdek & Fine, 1994) and prosocial-competent behavior (Chen, 1994). Researchers have explored the important role of acceptance within populations likely to experience rejection such as homosexuality, pregnancy, and transgender instances (Glavak, Kuterovac-Jaqodic, & Sakoman, 2003; Koken, Bimbi, & Parsons, 2009), though family acceptance in a general sense, especially as it relates to the spatial composition of the home, is not widely explored. Thus, it is important to more fully understand the impact of the immediate spatial environment on familial acceptance.

Finally, decision making is another important entity of family functioning. The way in which families approach problems can be a reflection of how families interact and solve issues. As an example, joint decision making among family members, and particularly adolescents, indicates flexibility and openness in the relationship, whereas unilateral decision making patterns generally point to less supportive relationships (Hauser et al., 1984; Lamborn, Dornbusch, & Steinberg, 1996). Family communication and problem-solving have been found to be protective factors for adolescents who are exposed to neighborhood and school violence, reducing psychological distress levels (LeBlanc, Self-Brown, Shepard, & Kelley, 2011). Family communication in general has also been shown to contribute to the development of middle school aged children's positive value acquisition and social competence (Hilaker, Brophy-Herb, Villarruel, & Haas, 2008). Given the positive benefits of healthy family functioning, it seems important to identify the way in which the physical features of the home may facilitate these processes.

Taken together, the extant literature demonstrates that family functioning is an important foundation upon which identity, strength, values, and motivation are built. Since family processes are infused with meaning and are associated with marked outcomes, it is important to consider how the physical elements of the home may be related to family involvement and functioning.

Physical Space and Family Functioning

Although there is an extensive body of work showing the benefits of healthy family functioning, relatively little work has been done to examine how spatial features of the home might facilitate positive family interactions, despite the fact that the home is an ideal place to support social interaction with family members and guests. Research focused on exploring the

associations between the specifics of the physical home and family has often focused on extreme or special familial circumstances such as disorder, disability, or safety. Attention deficit disorder (ADD) and autism are examples in which the environment, specifically over-stimulation in color, texture, exposure, etc., could bring about behavioral and psychological problems (Emerson et al., 2000). The elderly generation often finds themselves struggling to navigate their environments as physical functioning and disability issues become concerns in later life (Lewis & Turner, 2006). Homes also have the potential to be hazardous, especially for young children, (Kopec & LaCapra, 2008) who must be protected from home chemicals and conceivably dangerous home systems (e.g. furnace, plumbing, stove, medicines). Although it is certainly important to understand how physical aspects of the home may influence the safety and quality of life for special populations and specific individuals (e.g., elderly, children with disabilities), there is a need to better understand how the structure of the home might affect normal family routines and processes.

Indeed, it has been established that home-based family routines and habits can positively contribute to family closeness (Bennett, Wolin, & McAvity, 1988; Fiese et al., 2002). For example, family mealtime rituals are among the most beneficial for positive family and child development outcomes (Fiese et al., 2002). Though family routines have been studied quite frequently in the past twenty years, the setting in which they take place have less of a presence in contemporary research. Since these routines, rituals, habits, and teaching moments are so important to fostering family closeness, it may be significant to explore how and where these familial interactions are set in the physical environment. For instance, it makes sense to explore how and where family dinner is taking place (i.e., all together in one room versus spread about the house) rather than merely just that it happens.

It seems reasonable to suggest that family processes may be benefited when provided with an affording environment given that children gain so much from affording environments as far as learning and functioning (Dunst et al., 2001). Researchers have suggested that family interaction is facilitated by homes that a) accommodate family activities, b) accommodate multiple activities in the same location, c) facilitate household tasks, and d) maximize aesthetic appeal of family spaces (Miller & Maxwell, 2003). Additionally, researchers have found that parents in crowded homes are less responsive to their children, and thus speak in less complex, sophisticated ways to their children (Evans, Maxwell, & Hart, 1999), suggesting that homes can affect the ways family members interact.

Taken together, these findings suggest that the home can affect individual outcomes (e.g., asthma, injury) and facilitate family processes such as familial routines and rituals. Largely underdeveloped in current research is an emphasis on the spatial affordances (e.g., openness and homogeneity) that a house can provide the family and the resulting interaction patterns that occur within the residential environment. Therefore, the overall purpose of this study is to examine the ways in which actual aspects of the home environment (i.e., density and great room) and perceived aspects of the home environment (i.e., feeling too crowded, too spread out) may be related to family processes (i.e., family affective responsiveness, emotional expressiveness, acceptance, decision making).

The Present Study

The intention of this study is to understand more fully how spatial variables in the home (both actual and perceived) are related to family functioning. The home is an influential microsystematic factor that has the potential to affect family patterns due to its ever-present nature (Bronfenbrenner, 1979). Spatial syntax theory indicates that some spaces are more

appropriate for family interactions than others. The notion of environmental affordances purports that the environment (e.g., the home) provides opportunities for either positive or negative interactions, and these interactions can be a function of the space they occupy as habits form in specific areas of the home, as put forth by place attachment theory. Furthermore, the concept of optimal stimulation explicates the ways in which varying levels of potential stimulation (variable according to homogeneity and openness of space) available in any given environment may influence people and processes. Thus, at the most basic level, it is apparent that families and their residential environments are interconnected. Grounded in the extant research and established theory, it was deemed important to examine the relation of the physical home to family functioning. Therefore, a model was tested (see Figure 1) in which actual home density and openness, and perceived home crowding and distance, predicted family functioning variables (e.g., responsiveness, emotional expression, acceptance, and decision making).

It was hypothesized that actual home density would be linked to decreased family functioning including less affective responsiveness, emotional expression, acceptance, and decision making. Specifically, it was hypothesized that home density and home openness would affect family functioning through perceptions of crowding because perception has been shown to influence behavior above and beyond reality in many instances. It was further hypothesized that feeling distant from family members would also mediate the relationship between actual home variables (e.g., density and openness) and family functioning. It was expected that crowding and distance would be negatively related to affective responsiveness, decision making, acceptance, and emotional expression for the occupants. Figure 1 illustrates the proposed conceptual model.

Methods

Participants

Participants in this study included 126 families whose child was attending a university's preschool/kindergarten facility in the western United States. Gender of children was split to be 54% male (N = 68) and 46% female (N = 58). Surveys were administered to parents to determine home variables and family functioning patterns. Mothers were the primary respondents for the home survey (90.5%, N = 114), though a few fathers completed the survey (9.5%, N = 12). Mothers' average age was 34.03 years (ranging from 24-52), and fathers' mean age was 35.96 years (ranging from 23-60). Average income was \$40,000-\$50,000. Mothers, on average, had completed a Bachelor degree; fathers had completed at least some graduate school, on average. For all questions, respondents were provided with a *Not Applicable* option for when the child has not been seen in the situation described. Table 1 exhibits further demographic information.

Procedure

Surveys were sent to the parents of each child using Qualtrics, an online survey program. Parents were able to consent and fill out answers to survey questions from their home or work computers at their convenience using an individualized link.

Measures

Physical home and perception items. Items regarding the physical home environment fell into two categories: actual and perceived. The actual, or objective, items were based on facts such as home square footage. The perceptual items were centered on how a parent feels about his or her home. As a scale that measures the items of interest does not currently exist, I created

a survey to measure the variables of interest, entitled The Physical Home Environment Inventory (PHEI).

Home density. Home density was measured by calculating the person-per-square-footage ratio via two open-ended questions: “How many people live in your house?” and “How large is your home, in square feet?”

Home openness. A great room is the name of an open area between the kitchen and primary living space in a household. The fluidity between the kitchen and family areas of the home was measured by one Likert-type question (I have a “great room,” where my kitchen and living areas are one big space) ranging from 1 (extremely untrue) to 7 (extremely true).

Crowding. Perceived crowding was a summed variable comprised of two questions using a Likert scale. First, “I feel crowded in my house,” was answered according to options ranging from extremely untrue to extremely true (values of 1-7). The second question, “I wish that the separate rooms in my home were more closed off,” was answered using a 6-point scale ranging from strongly agree to strongly disagree ($\alpha = .66$).

Physical distance. To determine felt distance (i.e., the degree to which family members feel separated unnecessarily from each other) the item “I feel like our family is too spread out within our home” was measured using a Likert-type scales of strongly agree (1) to strongly disagree (6).

Family functioning. Family functioning was measured using 19 items from the McMaster Family Assessment Device (FAD, Epstein, Baldwin, & Bishop, 1983). Items included the entire General Functioning and Affective Responsiveness subscales. Responses ranged from 1 (*strongly disagree*) to 4 (*strongly agree*). *General Family Functioning* was broken up to reflect three distinct subscales: *Emotional Expression* (e.g., “we avoid discussing our fears and

concerns,” 3 items, $\alpha = .72$), *Acceptance* (e.g., “family members feel accepted for what they are,” 4 items, $\alpha = .83$), and *Decision Making* (e.g., “making decisions is a problem for our family,” 3 items, $\alpha = .78$). *Family Affective Responsiveness* (e.g., “we express tenderness,” 5 items, $\alpha = .72$) reflects the degree and prevalence of expressed affection and emotion in the family.

Participants answered how much they agree or disagree with statements about their family with response options ranging from 1 (strongly disagree) to 4 (strongly agree). Items were coded so that higher scores indicate better family functioning. A measurement model illustrating composition of family variables is shown in Figure 2.

Control. Because of the potential for socioeconomic status to impact home size and preferences, income was included as a control in the current analysis.

Independent and dependent variables, including the item breakdown of proposed scales, are displayed in Table 2.

Analysis

Preliminary analyses were conducted using the software program SPSS 18.0 (Statistical Package for the Social Sciences) to determine the correlational strength of the variables included in the study (see Table 3). Two variables refer to the actual home environment, being density and openness; and two variables refer to the perceived home environment: crowding and distance. The four endogenous variables for family functioning include: affective responsiveness, emotional expressiveness, acceptance, and decision making. Descriptive statistics for all variables are found in Table 4). After initial analysis, a structural equation model was created in AMOS 19.0 (Analysis of Moment Structures). The model was structured so that actual home elements predicted all family outcome variables, and perceived home elements were included as mediating variables between actual home elements and family functioning variables.

This structure supports the theory that the actual home will affect how people perceive it, and will lead to analysis of actual versus perceptual home environmental impact on family functioning. Structural equation modeling allows assessment of the combined effects of home environmental factors. Though all paths were tested (i.e., trimming methods were not employed), only significant pathways are shown in Figure 3 for the sake of increased clarity. Perceptual items, crowding and distance, were separately analyzed for their meditational potential using Sobel's tests (MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002).

Results

Model Fit

Fit indices were used to assess the overall model fit of the structural equation model. Based on examination of three fit indices together, I concluded that the model had acceptable fit. Model fit was assessed using three fit indicators, explained by Hooper, Coughlan, and Mullen (2008) as follows: (1) The Comparative Fit Index (CFI) compares how much better a model fits the data compared with a null model. (2) The Tucker-Lewis Index (TLI), which contains a penalty for lack of parsimony. The CFI and TLI should be equal to or greater than 0.9 (Hu and Bentler (1999) have suggested $TLI \geq 0.95$), indicating that 90% of the co-variation in the data can be reproduced by the given model. (3) The Root Mean Square Error of Approximation (RMSEA) adjusts for both sample size and number of degrees of freedom. Good model fit is obtained if RMSEA is less than or equal to 0.05 and adequate fit if RMSEA is less than or equal to 0.08.

Model fit indices generated by the current model were supportive of this conclusion ($\chi^2 = 164.09$, $df = 134$, $p = .04$; $TLI = .94$; $CFI = .96$; $RMSEA = .04$, 90% Confidence Interval [.01 to .06]). Figure 3 illustrates the regression pathways and variable relationships within this analysis.

Model Analysis

Home density. Home density was not significantly related to the actual openness within the homes of our sample. Home density was related to crowding (wishing for more physical separation; $\beta = .56, p < .001$) and distance from family members within the home ($\beta = -.26, p < .05$). Actual home crowding was related to two familial outcome variables via direct regression paths of trending significance: affective responsiveness ($\beta = .30, p = .076$) and familial acceptance ($\beta = .29, p = .053$).

Home openness. Results revealed a link approaching significance between actual home openness (having space organized in the “great room” fashion) and family emotional expression ($\beta = .20, p = .055$).

Home crowding. Crowding was negatively and significantly related to all family-outcome variables assessed, including family affective responsiveness ($\beta = -.35, p < .05$), family emotional expression ($\beta = -.44, p < .001$), family acceptance ($\beta = -.38, p < .05$), and family decision making ($\beta = -.41, p < .05$).

Perceived physical distance. Perceived distance (feeling too spread out within the home) was significantly and negatively associated with family acceptance ($\beta = -.24, p < .05$).

Mediation. Sobel’s tests were used to assess the mediational potential of crowding and distance within the model. Crowding was found to significantly mediate the relationships between density and affective responsiveness (Sobel’s test $z = -2.5$, two-tailed $p = .013$); density and emotional expression (Sobel’s test $z = -3.4$, two-tailed $p < .001$); density and familial acceptance (Sobel’s test $z = -2.5$, two-tailed $p = .013$); and density and decision making (Sobel’s test $z = -2.5$, two-tailed $p = .012$). The effects from actual home spatial variables (density and openness) presented in Figure 2 represent relationships above and beyond the effects of these

mediational variables. Distance was not found to be a significant mediator for any exogenous-endogenous relationship. A decomposition table showing direct (from exogenous variable to endogenous variable), indirect (exogenous variable through mediational variable to endogenous variable), and total effects within the model is shown in Table 5.

Discussion

The overall goal of this study was to investigate the ways in which actual spatial elements of the home (specifically density and openness) contributed to the perceived spatial home environment (feeling crowded and too distant from people within the home), and subsequently how all aspects of the spatial home (actual and perceived) were related to family processes (e.g., family affective responsiveness, emotional expression, acceptance, and decision making). Existing design and behavioral-environmental research has demonstrated the effects of space on the individual (Bell, Greene, Fisher, & Baum, 2001; Kopec, 2006), yet researchers had not yet explored familial consequences in such depth (Brummett et al., 2001; Maxwell, 2003). Findings of the present study reveal that home density makes an important contribution to how parents feel about their space (whether it be too much or too little) and how they relate to their families. The discussion and implications of these connections are discussed hereafter. It should be noted from the outset that although I will speak in terms of certain variables predicting others, all of the relations in the present study are correlational due to the cross sectional nature of the data. Therefore posited directions of effects are purely speculative.

Home Density

Results revealed that home density was related to perceived crowding and felt physical distance. As density increased, felt crowding increased. Yet, as density decreased, residents' perceptions of family being too distant within their home increased. Both perceived crowding

and perceived distance impacted family functioning negatively. Although not necessarily surprising or novel, these findings are nevertheless interesting as they underscore the notion that perceptions of both too little and too much space within the home environment may perpetuate negative consequences in family life. As optimal stimulation theory would support, too much stimulation (crowding) and too little stimulation (distance) could be detrimental to healthy family interaction.

Specifically, home density was found to affect family interactions above and beyond the variance accounted for by perceived crowding and felt distance. Trends suggest that as home density increases within the home, family members may be less likely to interact in positive ways (specifically in responsiveness and acceptance). It may be that these effects could be attributed partly to stress responses. Family members may feel guarded toward one another because they feel like their personal spatial needs are being violated. Thus, density may encourage individuals to turn inward (not responding to others, not accepting each other, etc.) in an attempt to ignore excessive stimulation.

Selective attention (intensely focusing to the exclusion of other competing stimuli) is another effect of environmental stress that can be brought about by density which might help account for the findings of the present study. For instance, as Evans and Maxwell (1997) indicated, increased environmental stress (a common effect of density and crowding) can encourage residents, especially children, to tune out distractions. This is a great survival skill in that focusing on the task at hand, even in environmentally stressful conditions, may be the only way to ensure task completion. However, Evans and Maxwell found the selectively attentive residents in their study to have a hard time tuning in and attending to important instructions and conversations (i.e., social interactions). This may apply to the present findings in that as density

and the ensuing stresses increase, family members may be more likely to tune each other out or respond to one another in other unhealthy ways (i.e., less accepting, less responsive).

Home Openness

The findings related to home openness were surprisingly sparse. Results revealed no relations between home openness and felt crowding and perceived physical distance. It was hypothesized that home openness would discourage crowding and potentially encourage felt distance due to the lack of physical constraints (such as walls). In other words, hypothetically it would seem that walls encourage feelings of crowding and closeness, and the lack of walls (openness) would encourage distance. Results were surprisingly not congruent with these suppositions.

In another initially surprising finding, home openness (i.e., the existence of a great room) was not influenced by home density. Perhaps this is because great rooms typically exist in homes of all sizes and densities. For instance, in very small living spaces, all of the living area may be comprised of one great room (i.e., studio apartment). Moderate to large sized homes employ great rooms as an intentional addition to other private bedrooms, bathrooms, and living areas. Therefore, the lack of relations between home openness and felt crowding/distance may be due to the fact that people have open floor plans in both very small and very large apartments/houses.

Findings of the present analysis suggest home openness is related to family emotional expression in that as openness increases, family functioning trends toward more healthy emotional expression. This relationship may exist because when family members share space (whether it be because they have no other option, such as is the case with studio apartment living, or because they have designed their homes to promote such interaction), they may reap

the benefits of shared conversations promoted by space and affording chances to express themselves.

The notion that home openness may affect certain elements of family functioning is supported by space syntax theory in that open, easily accessible spaces (such as a great room) become popular gathering places that afford family interaction. A great room is generally a focal point of the home where guests are invited (public exposure) and family members execute daily-living tasks (private realm). Thus, the great room may naturally be set up to be the place where family and guests congregate. Since the openness and homogeneity of the great room invite many to mingle in the same area, whether or not they are engaged in the same activity, family members may find themselves interacting with one another more frequently than if separate rooms were employed for each of the tasks that the great room area supports. Families also may have to work through the emotional frustrations and stresses that sometimes accompany mutual living areas via conversations and expressed feelings. Either way, having open space to share seems to encourage expression. Additionally, these families may be more able to discern individual moods and emotional variances in family members because of their shared environment. Somehow being together (even if possibly doing different things) in the same room may afford families the opportunity become more comfortable and interactive with each other.

It should be noted though that even though openness seems to encourage family processes (albeit this finding only approached significance), the present study addressed neither the nature of the emotional expressiveness (e.g., positive and encouraging, or negative and biting) nor the quality of the family relationship. It would be interesting for future research to

attempt to further understand the role that great rooms may play in evoking either positive or negative emotions and in potentially facilitating stronger family relationships.

Home Crowding

Perceived crowding was negatively related to all of the family interaction outcomes measured in the present study. Specifically, crowding was found to decrease familial affective responsiveness, emotional expression, acceptance, and decision making. Perceived crowding also accounted for much of the variance in the impact of density on all family interaction variables, as expected. In other words, the more crowded individuals feel in their home the more negative they feel about their family interactions. These findings add to a growing body of work suggesting that perceptions of one's space tend to have more of an impact on individuals and groups, including families, than does the actual space (Baum, & Koman, 1976; Hanscombe et al., 2010).

It may be that as perceived crowding increases and stimulation levels are high (beyond optimal), responding to family members (i.e., accepting them, expressing emotion with them, or making decisions together) in calm, kind, patient ways seems to become more difficult. Simply, crowding seems to embody an innate amount of stress (Evans & Cohen, 1987). Thus, when family members feel that there is less-than-adequate space their feelings of frustration (and stress) may raise. It may be that when feeling crowded, family members view each other not as mutually contributing members belonging to a unit (acceptance) but as a cause of stress and frustration. It is important to point out that the present study did not specifically measure stress as a component of perceived crowding, though other researchers have found stress to be linked to crowding and the ill effects that often follow (Evans & Cohen, 1987). Future work should examine whether stress, or other possible factors, leads to the specific family functioning

outcomes examined in the present study (e.g. responsiveness, emotional expression, acceptance, decision making).

An interesting nuance regarding crowding as it was measured in the present study is that when parents reported feeling crowded in their home, they also reported wishing for more separation of space. Seeking for more separation of space, or architectural depth (summarized as wanting private nooks and rooms), has been related to crowding in other literature as well (Evans, Lepore, & Schroeder, 1996). Evans et al. (1996) discovered that greater depth in crowded homes (more architectural spaces, or closeness, versus openness) acts as a buffer to the negative effects of crowding (i.e., increased psychological distress and heightened stress levels in general). These researchers reasoned, and the present study supports, that people feel crowded when privacy is not readily available (through physical barriers and alcoves) in dense spaces. Optimal stimulation theory purports that open spaces, such as the great room, may foster too much stimuli for some. Indeed, perceived crowding as a potential source of uncomfortable stimulation reinforces the need for retreat areas where solitude can be found when privacy is needed. Thus, the quest for privacy and protection may be a driving factor for many of the negative family outcomes found in the present analysis. Future work should examine whether or not there are unique individual factors (personality, temperament, etc.) that might characterize those individuals who may feel crowded and exposed (whether physically or emotionally) in certain types of space. Further, future research should assess how homes provide privacy and protection for their residents, and how crowding may affect these perceptions.

Perceived Distance

In addition to the adverse effects of perceived crowding, the findings of the present study suggest that feeling too spread out from family members within the home adversely affects

family functioning, particularly family acceptance. A possible explanation for this association may simply be that healthy interaction is less likely to happen when family members do not interact at all due to spatial separation. Indeed, it takes interaction to build relationships. Miller and Maxwell (2003) expressed the idea that when considering the residential environment, bigger is definitely not necessarily better. The present study supports this idea and specifically reinforces the notion that excessive home space (exceeding the needs of occupant load) seems to discourage healthy familial interaction. Perhaps family members feel disconnected from each other due to an overabundance of space or physical barriers, such as walls and doors. Similarly, family members may not feel the need to accept one another if everyone has his/her own wing of the home, negating the need to “rub shoulders” or interact with family members in healthy ways. Further, family members may not learn important social rules, etiquette, or conduct (both within the family and with others) if they do not interact with one another on a regular basis in an affording environment. Future research should explore the extent to which the development of socially competent skills and abilities is influenced by feeling too spread out, and actually being spread out, from family members within the home.

Taken as a whole, the findings of the present study suggest that *actual* home density and openness, as well as *feeling* too crowded or too distant within the residential environment, impact the ways families interact. Density was related to felt crowding (positively) and distance (negatively), and both crowding and distance impacted family functioning negatively. Although home openness does trend toward positively affecting families, surprisingly, openness was not found to influence perceptual items in the current analysis. Ultimately, the actual home environment appears to have the potential to afford certain perceptions, and these perceptions

impact family interactions, so it is important for those who study, design, and live in residential settings to consider the familial implications of both actual and perceptual elements of space.

Implications

Findings of the present study might be useful for families, designers/architects, and researchers as they attempt to create an environment that afford successful family interactions. As home factors, both actual and perceived, were found to influence family functioning, it may be beneficial for those who work with the actual space of a house to seek to mitigate the negative effects of perceived spatial imbalance. Though actual structural constraints of the home and spatial dimensions may be hard and expensive to change, designers and homeowners may seek to alter the perception of the existing home environment. Some researchers have suggested that feelings of perceived crowding can be eliminated by intentional arrangement of furniture and organization (Evans & McCoy, 1998; Kopec, 2006; Shield & Dockrell, 2003; Wilson & Boehland, 2005). Others have suggested that spatial organization, such as architectural depth, may be a buffer to crowding effects (Evans, Lepore, & Schroeder, 1996). Families may find that they can alter the perception of density by using décor and accessories, such as mirrors, light paint, and visually light weighted furniture, to mitigate detrimental effects of perceived crowding. These suggestions may assist families and those who design their home environments to make the home a more affording space without having to redistribute structural constraints (e.g., walls).

Additionally, it may benefit families and designers to encourage incorporating areas of personal identity within a home, such as bedrooms, desk space, offices, relaxing nooks, creative centers, and so forth, to help residents feel that they have a place of retreat in attempt to battle the effects of perceived crowding. Perhaps the open floor plan, when executed properly and

including retreat potential, can alter the perception of feeling trapped, crowded, or even too far apart from other people.

The findings of the present study may also be of use to therapists and researchers. As perception, according to my findings, seems to be the key factor in the impact of space on family interactions, therapists may assist families to deliberately weigh what makes them feel less crowded and distant and take measures to remedy the situation. Finally, researchers may benefit from the findings of this study as they strive to more fully explain family functioning and its influences. It will be important to replicate and build upon these findings to more thoroughly expand the existing knowledge-base of human-environment interactions.

Limitations and Future Directions for Research

This study extends previous research by providing insight into how actual elements of the home environment contribute to perceived environmental elements, and thus how family interactions are influenced. Despite the contributions it makes, the study is not without its limitations. First, as noted previously, causality cannot be determined due to the cross-sectional and correlational nature of the data. Longitudinal and experimental work is needed to better understand directionality in the relations found between variables in this study. Second, the current sample represents a small portion of the worlds' cultural and socioeconomic environmental experiences; people have widely varying housing, density, crowding, and distance realities and expectations. In this way, this study is not widely generalizable across various cultures. It would be interesting to see how the effects of crowding (in actuality and perceptually) translate and vary across the life course and between cultures. Hence, future work should explore samples with greater ethnic diversity within the United States, and be conducted in a variety of other countries, as Anderson (1972) has likewise suggested.

Next, in the future it may be interesting to consider that perceived spatial preferences may not be the same across gender (Aiello, Epstein, & Karlin, 1975; Freedman, Levy, Buchanan, & Price, 1972; Hasell, Peatross, & Bono, 1993; Kopec, 2006; Savinar, 1975). Work in the future should examine the effects of spatial features combined with the gender composition of a family as a whole, and not just individual gender preferences (e.g., families comprised of father, mother, four daughters, may react to space differently than a family composed of a father, mother, and two sons). It would also be beneficial to repeat the present analysis with an even number of mother and father participants to see if the findings hold true for men as well.

Finally, the relationship between family interaction and home spaces is still an area needing much additional research. Maxwell (2003) stated that “family togetherness is more a function of what’s going on in a room than the room itself” (p. 1); thus, it will be important to determine the extent to which additional physical and perceptual elements of residential spaces (perhaps including stair abundance, shared private space such as bedrooms, ceiling height, or available outside space) afford the preferable kinds of familial interactions.

Conclusion

The nature of human interaction with the residential environment seems to be a bi-directional process. This study aimed to increase understanding of the ways in which the environment shapes family relationships. Home environments affect the ways many feel about their personal space, and thus the home has the potential to influence relationships with family members. With an eye toward the future, shaping a home that helps residents feel secure, with respected privacy and adequate social stimulation, can eliminate potentially harmful consequences for the family. Families, designers, and researchers can benefit from being aware

of the relational consequences that come with home elements of density, openness, crowding, and distance, and make efforts to create environments that support their goals.

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Table 1

Demographic Information for Current Sample

	N	Mean	SD	Range	Minimum	Maximum
Mother Age	125	34.03	5.002	28	24	52
Father Age	121	35.96	5.800	37	23	60
Children in Household	124	3.23	1.268	7	1	8
Mother Education	126	5.17	1.418	6	2	8
1= Less than high school 2= High school diploma 3= Some college 4= Associate degree 5= Bachelor degree 6= Some graduate school 7= Master's degree 8= Ph.D, J.D., M.D. or similar						
Father Education	126	6.06	1.636	6	2	8
Home Size (square footage)	109	7100.00	1439.456	7100	500	7600
Yearly Gross Income	126	7.95	2.179	10	1	11
1= None 2= Under \$5,000 3= \$5,000-14,999 4= \$15,000-24,999 5= \$25,000-29,999 6= \$30,000-39,999 7= \$40,000-49,999 8= \$50,000-74,999 9= \$75,000-100,000 10= Over \$100,000 11= N/A						

Table 2

Variables and Item Breakdown of Latent Scales

Actual Home Environment Variables	Measurement Items
Density	1. <i>How many people live in your house? / How large is your home, in square feet?</i>
Openness	1. <i>I have a "great room," where my kitchen and living areas are one big space.</i>
Perceptual Home Environment Variables	
Crowding	1. <i>I feel crowded in my house.</i> 2. <i>I wish that the separate rooms in my home were more closed off.</i>
Perceived Physical Distance	1. <i>I feel like our family is too spread out within our home.</i>
Dependent Variables	
Affective Responsiveness	1. <i>We are reluctant to show our affection for each other. (reverse coded)</i> 2. <i>Some of us just don't respond emotionally. (reverse coded)</i> 3. <i>We don't show our love for each other. (reverse coded)</i> 4. <i>Tenderness takes second place to other things in our family. (reverse coded)</i> 5. <i>We express tenderness.</i> 6. <i>We cry openly.</i>

Dependent cont'd

Emotional Expressiveness

1. *In times of crisis we can turn to each other for support.*
2. *We cannot talk to each other about sadness we feel.* (reverse coded)
3. *We avoid discussing our fears and concerns.* (reverse coded)
4. *We can express feelings to each other.*

Acceptance

1. *Individuals are accepted for what they are.*
2. *There are lots of bad feelings in the family.* (reverse coded)
3. *We feel accepted for what we are.*
4. *We don't get along well together.* (reverse coded)

Decision Making

1. *Planning family activities is difficult because we misunderstand each other.* (reverse coded)
 2. *Making decisions is a problem for our family.* (reverse coded)
 3. *We are able to make decisions about how to solve problems.*
-

Table 3

Correlational Table for all Variables

	Income	Density	Openness	Crowding	Distance	Responsiveness	Acceptance	Emotional Expressiveness	Decision Making
Income	--								
Density	-.619**	--							
Openness	.104	-.131	--						
Crowding	-.392**	.592**	-.107	--					
Distance	.150	-.250*	.051	-.247**	--				
Responsiveness	.127	-.049	.127	-.237**	.015	--			
Acceptance	.002	.039	.065	-.160	-.172	.453**	--		
Emotional Expressiveness	.066	-.129	.173	-.318**	.020	.534**	.492**	--	
Decision Making	.149	-.179	.118	-.324**	-.044	.406**	.518**	.475**	--

** p < .01

* p < .05

Table 4

Descriptives Table for All Variables

	<i>N</i>	Mean	SD	Minimum	Maximum
Density	104	0	0	0	0
Openness	118	4.57	2.42	1.00	7.00
Crowding	120	3.04	1.67	1.00	8.00
Distance	120	2.18	1.20	1.00	7.00
Responsiveness	124	4.51	.51	2.40	5.00
Emotional Expression	124	4.37	.59	2.33	5.00
Acceptance	124	4.32	.62	2.00	5.00
Decision Making	124	4.10	.71	1.33	5.00

Table 5

Decomposition Table of Standardized Direct, Indirect, and Total Effects on Family Functioning

		Direct Effects	Combined Indirect Effects	Total Effects
Affective Responsiveness	Density	.30	-.20	.11
	Openness	.14	.01	.15
	Crowding	-.35	--	-.35
	Distance	-.07	--	-.07
Emotional Expression	Density	.18	-.25	-.07
	Openness	.20	.01	.21
	Crowding	-.44	--	-.44
	Distance	-.08	--	-.08
Acceptance	Density	.29	-.17	.12
	Openness	.08	.01	.08
	Crowding	-.38	--	-.38
	Distance	-.24	--	-.24
Decision Making	Density	.01	-.20	-.19
	Openness	.10	.01	.11
	Crowding	-.41	--	-.41
	Distance	-.17	--	-.17

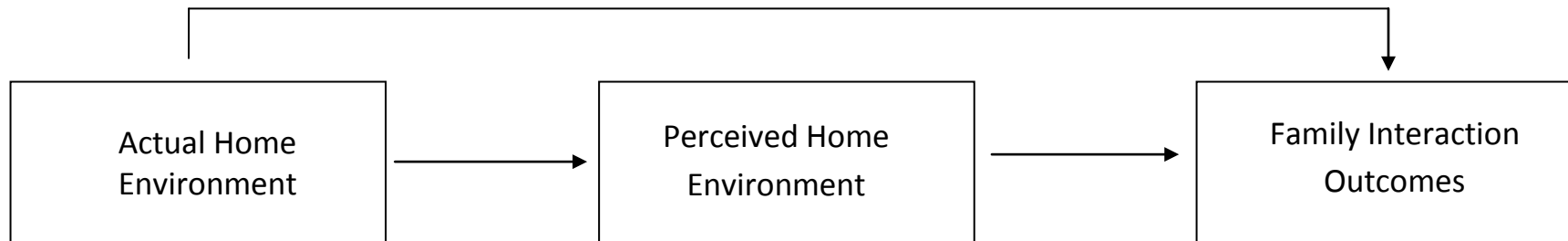


Figure 1. Conceptual Model

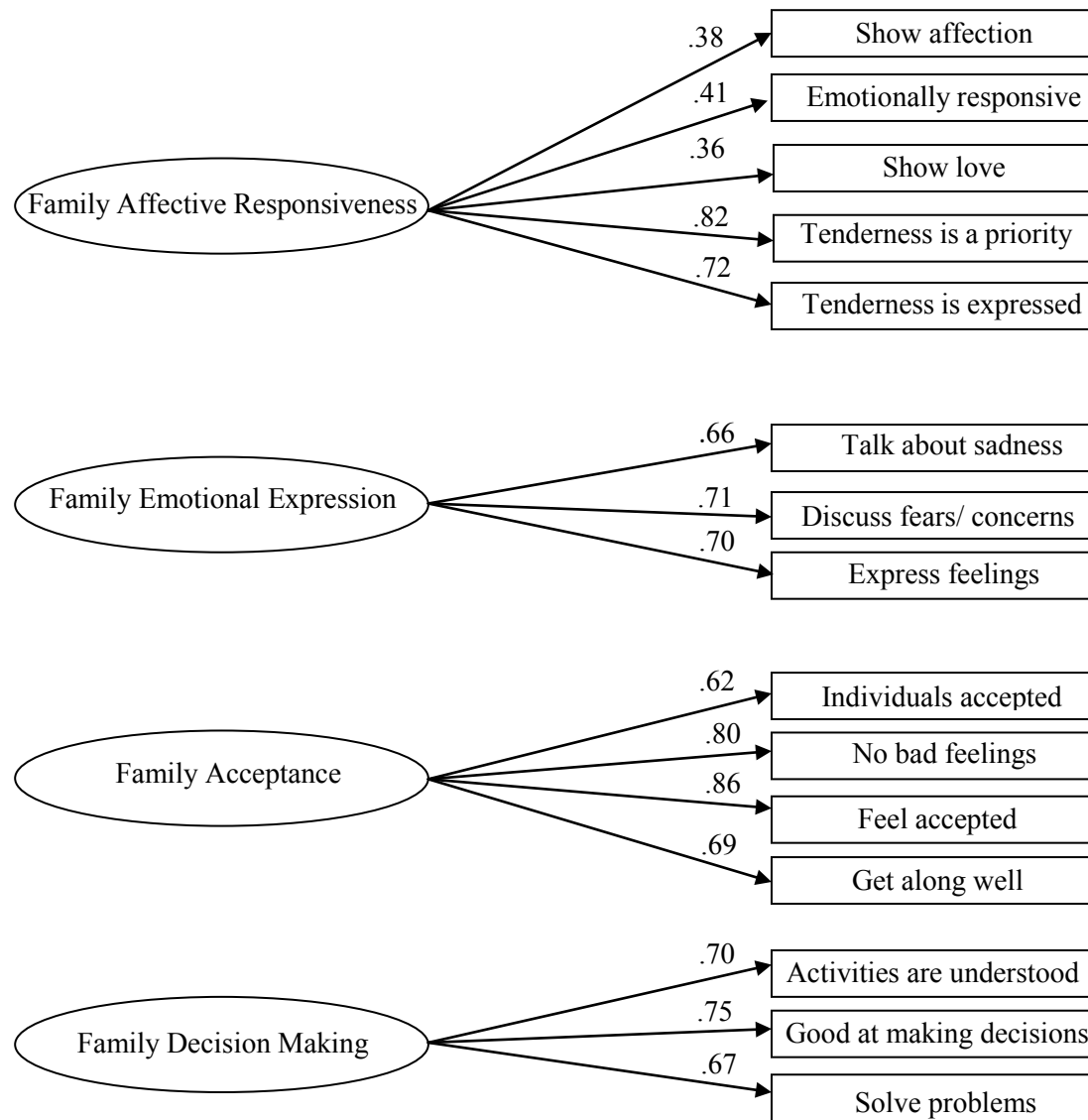


Figure 2. Measurement Model for Family Functioning Variables

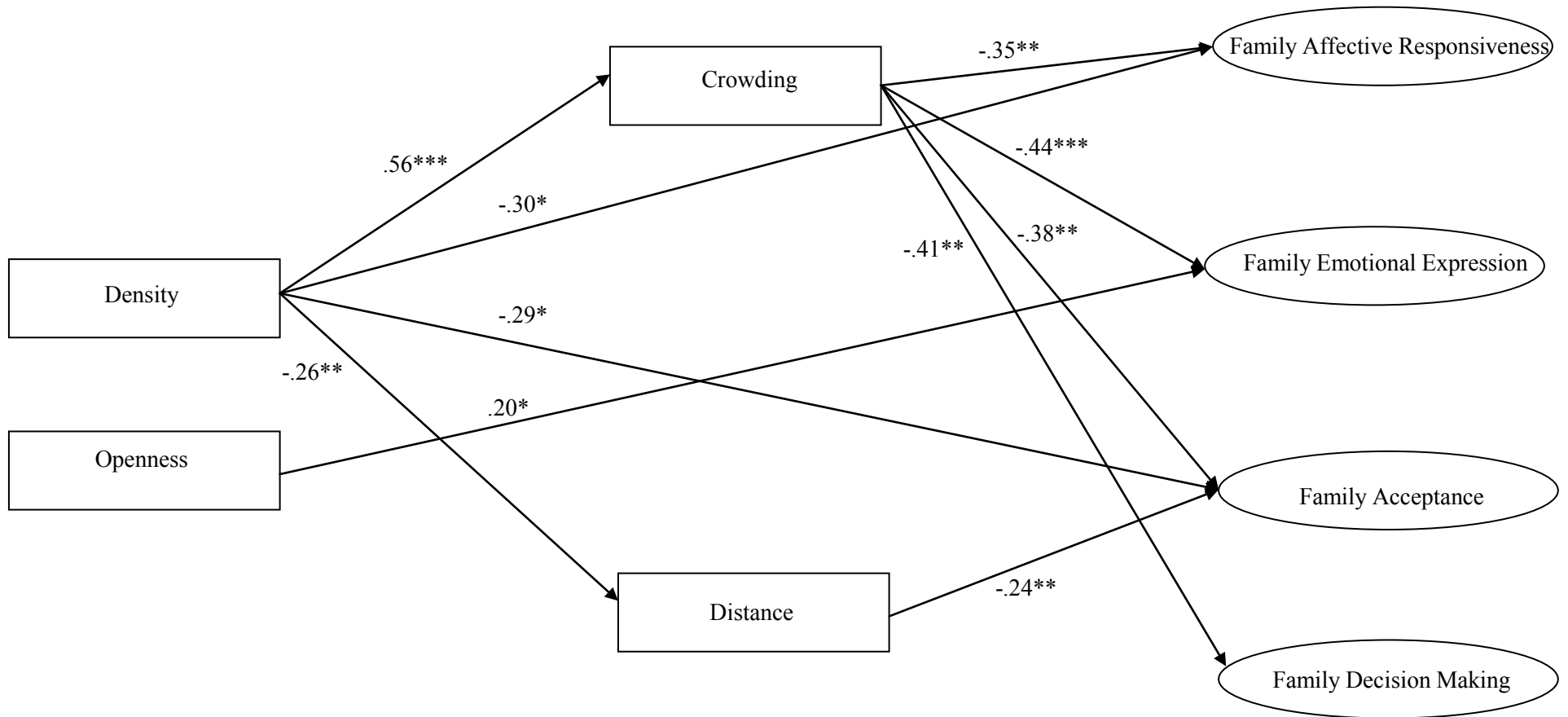


Figure 3. Structural Equation Model

*** $p < .001$, ** $p < .05$, * $p < .10$ level

Note: only significant paths are shown for clarity, though all paths were tested.