Planned and Emergent Design in USA and India: A Study of the Impact of Cultural Norms on Interior Space

THESIS

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By

Priya Ramnath, B.S., BSBA

Graduate Program in Industrial, Interior and Visual Communication Design

The Ohio State University

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Master's Examination Committee:

Elizabeth B.-N. Sanders, Advisor

Carolina Gill

Jeffrey Haase
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Abstract

As designers we almost always have a methodology in place, when in reality design works in a creative, emergent fashion. Through the creative design process, non-routine ideas evolve and innovative solutions are found.

This thesis is primarily about doing research to understand how non-designers design their space. Is interior space adaptation participatory? Do space constraints in countries like India make for innovative solutions? What role does the individual play in the evolving design of the home? How do non-designers adapt and make changes to their built environment?

A secondary purpose of the research was in exploring patterns in two distinctly different societies, India and the United States, to see if any common patterns would emerge or would they be very different because of a variation in size, population and needs in the communities.

Thirdly, the role of sustainability in creative design and in understanding how this could be of significance for our future was given consideration. With global natural resources shrinking and the population growing, what are the steps the people in India are taking to conserve, rethink and reuse the limited available resources?

Secondary and primary research methods were used for initial exploration, for analysis and to arrive at conclusions.
Dedicated to my husband Rajiv and my son Arman.

You make every day special.
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Vita

1991 .................................................B.S.B.A, The Ohio State University

2004..........................................................B.S.D, The Ohio State University

2004- 2007 .................................................Independent Consultant

2007- 2010 ...........................................Interior Designer, M+A Architects

2011 to present ...........................................Facilities Planner, State of Ohio

Fields of Study

Major Field: Design
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Chapter 1: Introduction

1.1 Introduction

This thesis addresses research that was done on interior spaces and the home environment in the United States and India to understand how interior spaces creatively evolve in two different cultural contexts. Families of Indian origin in the USA were participants along with Indians families in India. The rationale behind selecting Indian families in the USA was that they would serve as an appropriate comparison of study because of being influenced by the United States culture. The Indians in the USA were also a population of convenience for the researcher and removed ethnicity as a variable for the research. Preliminary secondary research on the topic of creative and innovative design on the home environment was done. Factors such as design in the presence of constraints such as lack of space, resources, money, etc. were considered in an attempt to account for differences in interior spaces in the USA and India. See Figure 1 for a visual representation of the initial search.
The domain of interest was the household, focusing on the middle class strata of society. The researcher found that there is literature on topics about evolutionary design, called “emergent design”, in fields such as architecture and computer science. However, not much information about emergent design was available in the field of interior design. This led to the thesis title: “Planned and Emergent design in the USA and India: A study of the impact of cultural norms on interior space”. Emergent design in this application is defined by the researcher as an evolving architecture that occurs as a reaction to situations of living.

During secondary research, two areas of interest came to the forefront. One was regarding living spaces in the context of different cultures. People in different cultures viewed their home environment in different ways. What is the norm in the United States and western countries is different from the norm in India or Eastern countries. The
second insight was that these living spaces, whether in the West or East, were often
designed by non-designers.

Interior space is dependent on the people who use it. Many non-routine, creative ideas
can cause the emergence of an interior space. Cognizance of different viewpoints – one
from the perspective of the American home owner, the second from the perspective of the
Indian home owner – can bring new insights in the research on the evolution of homes.
For example, a home in the United States could be modified to suit the needs of the
expanding nuclear family, children going away to college, etc. A home in India could be
modified to suit needs such as parents moving in, children moving out, etc.

Designers bring technique and ability in the designing of an interior space. A designer
would increase the functionality of a space after understanding the needs of the people
using it. Non-designers, on the other hand, bring context if they are the home owners
utilizing the space. Living in the same home over many years gives such non-designers
an authority over the space that a designer would lack. This thesis is primarily about
doing research to understand how non-designers design their homes. The role of the non-
designer is essential in understanding planned and emergent interior design in the United
States and in India.

In doing research in the area of planned and emergent design, many facets were
considered including the evolution of innovative design, culture and perception, resource
use, emotion and design. Below are questions and aspects of these facets that were
considered.
Design innovation is, by its nature, evolutionary and research is needed to understand how interior space evolves. For example, Nihal Perera (2009), writes “between and besides official plan-making, ordinary people produce more quantity and variety of spaces than the authorities and professionals. They both adapt to and adjust extant spaces for their daily activities and cultural practices, thus producing lived spaces out of abstract space. Yet we know very little about these basic space-making processes. (This article aims) to acknowledge and understand the processes of familiarizing space employed by ordinary people to create milieus that can support their everyday activities and cultural practices.” In understanding the process of innovative design several questions about how space creatively evolves were asked by the researcher. Is interior space adaptation participatory? Do space constraints in countries like India make for innovative solutions? The thesis question asked was “How do non-designers adapt and make changes to their built environment”?

An individual’s culture can affect his or her perception and use of a space. In comparing cultural practices in homes in the United States to those in India what commonalities and differences would emerge? Would any connections and patterns be found? In living in India for twenty-one years and the United States for more than twenty years, the researcher has found, for example, that in the United States emphasis is put on the individual. The mindset is that of a need for one’s own space and a desire for privacy. In India, however, the mindset is more towards the collective. People in India tend to focus on collective spaces and sociability. The Indians in the USA start with the Indian mindset but adapt in the USA.
Resources are used differently in the United State versus in India. In cities like New Delhi and Kolkata, for example, most people tend to live in apartments. This is because of a lack of space for the large population. Many adaptive practices have to be followed to adjust to the smaller footprints of the homes. In cities like Columbus, even though there has been an increase in population in the central city, more people live in suburbs. In 2008, approximately forty percent were in the metro area and approximately fifty-eight percent lived in suburbs (http://greaterohio.org/files/policy-research/population.pdf). The homes have a larger footprint and each person gets a larger square footage of living space.

The researcher wanted to recognize the role of emotion and emotional attachments on design. In the evolution of the home, there could be ties to the past that manifest themselves in the present. Plans for the future growth of the home could also be a continuation of the current situation or reaction against it. Research done for this thesis in the United States was in homes of participants of Indian origin. Attachment to certain norms in India and keeping them after being uprooted to the United States could impact the evolution of the home. Similarly, people in India could stay in the same home for a long period because a parent had owned the home. The emotional ties to a home might play as strong a role to the home as do the physical ties to it. As a personal example, the researcher’s mother has an apartment in New Delhi, India. Though the home is occupied only three weeks of the year (when she returns from the United States to visit) and it is impractical to keep, she is unwilling to sell the home because it belonged to her parents.
1.2 Researcher’s background

The researcher’s background had relevance in influencing the thesis topic. This background also played a part in navigating the dual research required in USA and India. The researcher grew up in India and was witness to changes being made in people’s homes. In India the mindset regarding homes had always been that one lived in the same home unless there was a move made to another city. If moving to another city, people who owned their home would try and keep it as long as possible. This mindset meant that situational adjustments were always being made to the home and adaptations regarding the spaces were done on a regular basis.

As an interior space designer living in the United States, the researcher has created many spaces that have been effective and functional. In working professionally, the researcher was considered the expert in providing solutions to client needs. Often times it was higher level managers who decided it was not relevant to seek input from the end users who actually used the space. This led the researcher to realize that rarely are the users of spaces involved in any participatory type of interaction with the designers such as visualizing and verbalizing what their space would look and feel like. In fact, had they been asked, the non-designers using the space would most likely have added a lot of value to solutions being pursued because of their knowledge and familiarity of their space. The results from the interactions between the designers and the users could have created a space where the users would feel a sense of ownership because they contributed to effective solutions.
1.3 Thesis overview

This thesis documents the research done as part of the Master of Fine Arts Program in the Department of Design at The Ohio State University. The thesis is organized as follows, starting with chapter 2.

Chapter 2 covers a contextual review and understanding of existing research about interior spaces, adaptation to these spaces, mindsets of planners, the role of non-designers, etc. in the field of interior space design. The chapter covers secondary research that sets a background to the primary research that followed.

Chapter 3 concerns the methodology and rationale for using a case study research method, the process used in defining problems to be studied, and development of the case study design.

Chapter 4 discusses the case study research performed. Primary research was conducted in eight homes – three homes of people of Indian origin living in Columbus, Ohio (this includes a pilot study), three homes in New Delhi, India and two homes in Kolkata, India. Primary research activities included setting up a survey, initiating contact with participants via social media (Facebook), sending a journal to the home owners, followed by home visits. This chapter details the steps that were taken from recruitment to the research done in people’s homes.

Chapter 5 analyzes the research and presents findings. Here the perceptions of living in and modifying homes in the United States are compared to those in India. Analysis is also done on the data collected through surveys and home visits.
Chapter 6 concludes with the results from the research, implications of these results and future work planned.
Chapter 2: Background and related work

2.1 Space adaptation

How a building is used changes constantly. Buildings are not designed to adapt but they do so all the time (Brand, 1995). Buildings are changing and being reshaped all the time by cultural events, real estate values and usage. In the commercial front, buildings adapt quickly to turnovers. In domestic spaces, changes are slower and steadier, responding to family ideas, growth and prospects.

How a building is constructed varies in different countries. Most construction in America is built with lighter materials and insulation and geared towards homes that do not age well. Buildings in the United States are not meant to last long in contrast to homes in Europe where homes cost 50% more to build but last longer. Europeans tend to think in terms of generations while Americans think in terms of decades. Similarly, Indians think long term and any changes made to a home last a long time. Homes in India, for people in the same economic start as those of the United States, are built with bricks and mortar. The flip side of using material such as brick and mortar in India is that changes to structures cannot be done easily and cost a lot of money to do so. Sometimes even buildings that seem to have a temporary purpose and are thrown together can last a long time. With such buildings there is the freedom to do as one wishes without a high cost involved in making changes. In contrast, the cost of making changes is also higher in
buildings with high cost and rent. Hence, such buildings tend to be more inalterable, so fewer changes can be made.

Buildings are sometimes overdesigned by architects and allow for limited adaptability. Architects do not design buildings with improvisation in mind. Architects tend to want total control, to make all the decisions and have their design built by contractors. Planning and design is based on theory and a “user centered” participatory approach is not used. Designers are also not given training in schools about the role of the user. For example, a Berkeley study (Silverstein, 1967) about student dorms found that students tended to look for private housing as soon as they were able rather than continue living in the dorms designed for them. This was because the dorms had larger lounge areas that were not used and the rooms themselves were too small and did not give the students enough privacy and quiet. As a result of the publication of this study, the design of dorms improved in the United States.

In terms of architecture, vernacular refers to everything that is not designed by professional architects. Vernacular builders have generational knowledge and apply it to maintain and grow a building over time. In the interior, constant changes in homes and offices are done by its occupants in a vernacular manner – informal and practical and officially invisible (Brand, 1995).

The term “satisficing” was coined in 1956 by Herbert Simon and combines the words “satisfy” and “suffice”. Occupants of a home satisfice their way by fixing problems with solutions that are just good enough to work. A building learns from its occupants and the occupants in turn learn from the building. In reality, change is always occurring. For
example, homes need to adapt to parents moving in, teenagers moving out, rooms being rented out or converted to home offices, etc. Adaptation is, thus, a continuous process in a home. Living in a house for a long time makes the occupants realize what can change and what can be added.

Brand (1995) writes that a building is made up of different layers. See Figure 2. A building is made up of **site**, the geographical setting, location and it lasts forever. It is made up of **structure**, the foundation and it lasts 30+ years. A building is made up of **skin**, this would be the exterior surface that changes every 20 years. **Services**, the working guts of the building, the HVAC, wiring etc. is another layer of the building. A **space** plan, the interior layout of a building can last from 3 to 30 years and **stuff**, furniture etc. can change daily to monthly. The layering of a building defines how it relates to people. Brand (1995) writes that the slower processes of the building gradually integrate trends of rapid change within them. This thesis is written with focus on the **space** and **stuff** and how it relates to people.
Patsy Healey (2012) writes about the consequences of external ideas of planning and development that are used on specific histories and geographies. Some travelling planning concepts may not be effective unless emphasis is also put on the traditions of experience and innovation in the communities where the development is being planned. Healey gives the example of Porto Alegre in Brazil where the neighborhoods mostly developed in an informal manner. In this example, planned government budgets spent on projects only benefitted a small elite and needed to be redistributed to fairly benefit the neighborhood. Leaders allowed citizens’ voices to be heard and priorities were discussed and set up together. This method was labeled as “participatory budgeting” and its success attracted attention among other Brazilian cities. The author presents this example to show that patterns of core governmental activities can be shifted from one method to another with success. However, the author also makes the point that the technique used in Brazil
was specific to the context and could not necessarily be transplanted elsewhere and become successful.

Planners consider whatever is planned for their cities as the norm, not realizing that the planning is actually in response to situations that are unique and specific to the cities. It is important for planners to question implicit assumptions and frames of reference. For researchers and planning practitioners working transnationally, assumptions need to be constantly probed. For example, driving is the norm in the United States; therefore grocery stores are located in an area with ample parking. The grocery stores cover a lot of real estate and provide large quantities of items. In India, on the other hand, many people walk to the grocery store, which are small stores located at the corners of every residential neighborhood. The stores carry small sizes of items so that people can hand carry these items back to their home.

Healey (2012) writes that understanding what could be “contingent universals” in a global era, learning from experiences of others, and recognizing when it is more appropriate to have local responses to particular situations, would help planners to have more sensitivity and better expectations. Analytical questions such as “will this idea work here”, “should this idea be “imported” at the “present moment in this situation”, need to be addressed. The idea of planning is not an object or a thing; rather it is an evolving, fluid, mental concept, constructed from the meanings given to it in specific locales and the encounters and the tensions between planners and communities.
2.3 Design and emotion

Toby Israel (2010) writes that the past can play a role in the home that is lived in the present. By doing design exercises such as closing one’s eyes and imagining the past or by doing an environmental time line of places lived in, number of years lived in a particular city, associations can start to be made that connect the past to the present.

Sometimes, people want the opposite of what was in their past – as was found during an informal pilot study design exercise with graduate students conducted in winter 2012 quarter. The premise for the exercise was to recognize and understand the participatory factors involved in how a house evolves. It was a snapshot study of the past and future, through a dialogue and collage created with images and words that evoked emotions of the homes grown up in (past) and envisaging homes in the forthcoming years (future). A couple of students mentioned that the homes they grew up in were very cluttered and had felt very crowded, so now as adults they consciously lived in apartments with very little accumulation.

An individual’s own past has an impact on the history of place. A person’s environmental biography is important in gaining an understanding of a sense of self. These connections are shaped by physical environments but are also based on the psychological, social, cultural and aesthetic meanings a place holds for people. It is important to see home not only in relation to the past and present but also as a part of a life cycle that includes a constantly changing future.

Given the current mobility of society, sometimes emphasis is placed on special objects that move from house to house (Clare Cooper Marcus, 2006). These objects
become a symbol of our identities. These items include furniture, visual art, photographs and are valued for past memories and associations, intrinsic qualities and style and their useful and personal values.

Another concept proposed by Israel (2010) is a pyramid of housing needs similar to the pyramid created by Maslow (1998) that has a hierarchy of needs that are physical, emotional, and social and with self-actualization on top. The pyramid of housing needs includes the levels: a) home as shelter – meeting our basic needs; b) home as psychological satisfaction – meeting our needs for self-expression and belonging; c) home as social satisfaction – meeting our needs for privacy and independence while being a part of society; d) home as aesthetic satisfaction – for expressing the pleasure of beauty and e) home as self-actualization – meeting one’s spatial and existential needs.

People go through different stages of home ownership representing different phases of their lives. This includes a baseline stage that is dependent on economics, contacts and convenience; a stage of incremental change where one moves a number of times to resolve practical problems incrementally. Finally, the best stage would be an approximation of the ideal where the home is almost perfect in the eyes of the family. Even if this stage is not attained, it remains a goal for most home owners. The past is like opening a treasure chest. A house becomes a home once our basic needs for shelter are satisfied. The house becomes a symbol of self. In seeking our home as self-actualization, a need for aesthetic satisfaction also needs to be met after meeting the needs for shelter, security and psychological growth. A home must reflect the best of each of us uniquely,
using memories of our past, to create a home that illuminates our present sense of space (Israel, 2010).

2.4 Cultural practices

Spaces are conditioned by contexts and are negotiated by the stakeholders. The outcome of these spaces cannot be pre-determined but rather is ‘emergent’. In other words, situations and circumstances can affect how a space evolves. But Nihal Perera (2009) explains the processes of familiarizing space that is used by ordinary people to support their daily activities. He writes about ordinary people adapting to and adjusting to existing spaces for their daily activities and cultural practices. He writes that the process of familiarization of space directly affects and is affected by formal planning. Perera writes that ordinary people produce more quantity and variety of spaces than do the authorities and professionals. Ordinary people produce lived spaces out of abstract spaces. The author attempts to understand the process used by citizens to make a space known as accommodating, adapting and redefining a space. The article also acknowledges and highlights the importance and complexities of the processes of space making and the structures that get produced. Emergent spaces arise out of planned spaces. People enjoy their own culture and use their worldview as a lens to relate to their environment. People view spaces from their own backgrounds of community, their history and their memory (Perera, 2009). Extrinsic factors such as colonialism and culture played a role in intrinsic factors such as home and family.

Perera gives the example of Sri Lanka - the local people in a city made a space their own by absorbing extrinsic factors such as external occupation (colonialism), religion
(Buddhism), and creating intrinsic value in their homes with spatial arrangements that were a hybrid of indigenous culture and colonial conditions.

2.5 Space use in India compared to the USA

Secondary research was also done on space use in USA and India. In comparing interior space use in the United States to India several factors need to be considered. Figure 3 shows a framework created by the researcher, comparing USA and India in terms of society, community and household. The content of the framework was created using secondary resources. The content was also created using the researcher’s life experiences of growing up in India and observed behavior after migrating to the United States. Below are brief descriptions of overall differences in the two countries in terms of size, population, resources, mindset etc. The research for this thesis is focused on the household segment of the framework, at the bottom of the triangle.

![Figure 3: Framework comparing USA and India in terms of society, community and household](image-url)
The USA is approximately 3.7 million square miles in size while India is approximately 1.3 million square miles. There are about 312 million inhabitants in the USA while India has a population of about a billion. The population in the United States is older, with 79 million baby boomers entering their elder years in the next two decades (United States Census Bureau, 2008-2010). By contrast, the Indian population is an inverse pyramid with more than 50% of its population below the age of 25 (as cited in http://www.nationmaster.com/country/in/Age_distribution). India therefore has more people using less space with most of them being younger. See Figure 4 for comparison between median ages of people in the USA, India and China.

![Median age across 3 countries](image)

**Figure 4:** Comparison of age between people in India, USA and China since 1960 and projected over the next 70 years

There is an abundance of natural resources in the United States but a scarcity of labor. India, on the other hand has limited natural resources but an abundance of labor.
In terms of mindset, American society tends to be more individualistic with emphasis given to the self. Indian society by contrast tends to be more collective, with emphasis given to the needs of the group.

The researcher has experienced that in the United States, homes were purchased based on life stages that tend to be time based. There was the starter home as an initial purchase. A bigger sized suburban home was purchased once her son was entering school age. The school district determined the choice for this second home. The current plan is to downsize to a smaller home after some years, now that the researcher’s son has entered college.

In India, the tendency is to buy a home based on the life phase – what is done within the life stages. Unmarried children tend to stay in their parent’s home regardless of age. Even when married, usually, young couples cannot afford to buy homes, so they tend to stay with parents to start saving up money for a home. Multi-generational families stay together because of the convenience and because of cultural norms. Once a home is bought, changes are made within it if the needs of the family change, but rarely is it sold and a move made to another home. Acute housing shortages in urban areas may also contribute to a desire to stay in the same home. See Figure 5 for an image comparing the housing shortage in urban India in different income groups. Most people in urban areas in India live in apartments. Making physical changes in India is harder because buildings are constructed out of brick and mortar as compared to the wood drywall homes in the United States. The researcher studied homes of Indian participants in middle income groups in India, living in apartments and Indian participants in middle income groups in
the USA, living in single-family homes. The homes of participants in the USA are typical of most professional Indians living in the United States. Suburban living is also true for most American home owners whereas urban living is true for a majority of Indians in India.

![Urban housing shortage 2012](image)

Figure 5: Breakdown of housing shortage in urban India

In the United States, although homes have been traditionally single-family, because of the financial crisis, a lack of jobs for younger people and aging baby boomers there is a trend towards multi-generational living. See Figure 6 for a graph of a shift towards multi-generational living in the USA.
In India there is a lack of privacy. According to Anita Patil-Deshmukh, the executive director at Pukar - an independent research collective based in Mumbai, “Given that Indian culture is so deeply people-oriented, and family, friends, neighbors and relatives traditionally play such a large part in society, one has to wonder if more and more globalization is making the younger generation more self-centered,” (as cited in http://india.blogs.nytimes.com/2013/01/02/in-mumbai-privacy-is-hard-to-come-by/).

Culturally, an expectation of privacy has not been as strong as it is in the West. Living in close proximity to other people is a reality for most people in India.

The average size of homes in the United States went up 67% from 1970 to 2007. See Figure 7 for average square footage of homes in the United States from 1975 to 2010. In
addition, household sizes have decreased. Thus, given the above increase in average size of new homes, the square footage per resident has grown 250% over twenty-five years.

The percentage of new homes smaller than 1,200 square feet in the USA in 2004 was less than 5% (National Association of Home Builders, 2010 census, Pew Research Center). By comparison, a one bedroom Kolkata apartment has an average area of 350 square feet. The standard two or three bedroom Kolkata apartments have an average area of 750 square feet. (http://www.mapsofindia.com/kolkata/apartments-in-kolkata.html)

Figure 7: Average home square footage in the United States
The average number of people who live in a home in the United States is 2.7 as compared to 4.5 people living in a household in India. See Figure 8 for a graph comparing persons per household in the United States with China, Brazil and India.

![Bar chart showing persons per household in the U.S., China, Brazil, and India](chart.png)

Figure 8: Persons per household in USA compared to India, China and Brazil

At an average 2164 square feet, the home size in the United States is one of the largest in the world. See Figure 9 for a visual comparison of home sizes around the world.
2.6 Summary

The common theme in the secondary research above is that homes/buildings and places do not remain static but change because of the people using the space.

In doing secondary research comparing USA and India, the main differences regarding demographics are the size of the countries, with USA being much larger. There are differences in the number of people in each country, with USA being much smaller and there are differences in the age of the populations, with a higher percentage of younger people in India. In terms of mindset, USA is more of an individualistic mindset with emphasis on privacy. India, on the other hand, is a collective mindset with emphasis on togetherness and lack of a need for privacy. The homes in the USA are built of wood and drywall, while the homes in India are built of bricks and mortar. Zoning in the USA
works differently from India. In the USA there are clear residential and commercial zoning areas particularly in the suburbs. In India the demarcation is not so clear. Private medical clinics and offices can be in the same zone as residential areas.

Primary research opened new areas of avenues of understanding about culture and norms in USA and in India. The next chapter details the primary research and the methodology used.
Chapter 3: Methodology

3.1 Introduction to research methods

A descriptive case study methodology was used in doing research for this thesis. The sections below describe some of the characteristics, components and types of case studies. This chapter also describes the case study approach that was used for this thesis. Much of the material in this chapter has been drawn from Robert K. Yin’s “Case Study Research: Design and Methods”, (2002).

3.2 Characteristics, components and types of case studies

According to Yin, case studies are the preferred method when “how” or “why” questions are being asked, when the investigator has little control over events, and when the focus is on a contemporary phenomenon within some real-life context (as opposed to a historical event). The use of direct observation and systematic interviewing are characteristics of case studies. In doing research for this thesis, the main question asked was “how do non-designers adapt and make changes to their built environment”? Direct observation and interviewing of participants was done in their homes. The enquiry was done within the context of the home environment, with participants being families of Indian origin in Columbus, Ohio in the United States and Indians in New Delhi and Kolkata in India.
For case studies, components of a research design are important. The questions asked in these studies are important. In the research that was done for this thesis, questions asked were, do space constraints in countries like India make for innovative solutions? The proposition examined was “interior space” and the unit of analysis was the “family home”.

The basic types of designs for case studies are the single-case and multiple case designs. The same case study may involve more than one unit of analysis. Single and multiple case studies can be holistic or embedded. A holistic study has a single level or unit of analysis, an embedded study has multiple levels or units of analysis. In this research each home studied was the subject of an individual case study. The study compared homes in the USA with those in India. This makes this study a multiple-case design, holistic case study. See Figure 10 for a visual representation of basic types of designs for case studies.

Figure 10: Basic types of designs for case studies, with the case study type for this research added
3.3 **Conducting a case study**

In doing a case study, problems need to be defined. Furthermore, a case study design needs to be developed. Conducting a case study typically requires a pilot study. In the case of the research done for this thesis, a pilot study was conducted at a home in Columbus Ohio. For the purpose of this research, the problem to be studied was: who are the stakeholders and what role does the individual play in the evolving design of the home? A secondary purpose of the research was to explore patterns in two distinctly different societies; namely, the United States and India. In conducting case studies, convenience, access and geographical proximity are needed, particularly for a pilot study. This structure was kept in mind in conducting the single pilot study by the researcher. The pilot study done for the purposes of this thesis is described in detail in the next chapter.

According to Yin, when in training for a particular study, it is important to ask good questions, be a good listener, be adaptive and flexible, and be unbiased by preconceived notions. Thus, in doing research in the USA and India, this researcher kept the interview questions open ended, asked the participants their opinions and had them propose insights as part of the study.

Two other characteristics of case studies are direct observations and participant observations. Direct observation is useful in providing additional information on the topic being studied. For example, a home’s location or furnishings may indicate status. This was particularly true in the homes that were studied in India. Though the square footage of the homes was not large, the furniture, drapery, pillows etc. indicated the status of the
home owner. Participant observation – where the investigator participates in the events being studied - occurred only in the homes in India since it was instigated by the participants. This helped participants relax and contribute to the activity that was occurring.

Maintaining a chain of evidence where an external observer can trace the steps in either direction – from conclusion to initial questions or initial question to conclusion - is also a characteristic of a case study. In the research that was done for this thesis, it is possible for an external observer to trace the steps in either direction. This could be done by following the steps of the primary research detailed in the next chapter.

3.4 Analyzing a case study

In analyzing case study evidence, the priorities for analysis need to be set. Priorities on why something needs to be analyzed should also be determined. There are two strategies that are used in the analysis. The first strategy is to rely on theoretical propositions. The original proposition, in the case of research done for this thesis, the role of non-designer in the evolving home, helped to focus attention on analyzing certain data. Answers to “how” and “why” and a set of research questions (how does interior space creatively evolve in places with resource constraints? What needs to occur for changes to be made? Is the adaption by non-designers participatory by nature, and do constraints make for more original solutions? Who are the stakeholders of the outcome of the design? What role does the individual play in the evolving design of the home?) were asked in guiding analysis. A detailed description of analysis done for this thesis is in chapter 5. The second strategy is to develop a case study description. For the research
that was done for this thesis, a framework was created for organizing the case study.

Figure 3 in the previous chapter shows the framework.

A case study can have different varieties of written reports. A single narrative can be used to describe and analyze the case. The case study can also be augmented with tabular, graphic and pictorial displays. For the purpose of this thesis, a single narrative was used, added to with images and spreadsheets with data.

### 3.5 Summary

A case study research method was used for this thesis. Characteristics of this case study included a pilot study, open ended interviews and direct and participant observation. The next chapter is the actual case study.
Chapter 4: Case study research

4.1 Scope

The case study was done with three families of Indian origin in the United States and with five families in India. The research was done to gain an understanding of the evolution of the homes from what they were in the past, to observe the present conditions of the homes and to explore the plans their owners had for the future. The purpose of the research was also in understanding emotions about family life at home that came into play. These emotions were in reference to the past, the present, and the future.

A breakdown and description of the process and methodology used in doing the case study research follows. This includes the research plan, types of research materials used, the participant recruitment process, the participants who were selected, details of toolkits that were used, and the research documentation. It includes a sample of a study done in Columbus, Ohio and one done in Kolkata, India. The research process included an initial survey that was sent to participants, a journal sent to consenting participants and a home visit. There is a narrative section at the end with anecdotes that compares the participants’ behavioral dynamics and cultural attitudes in the United States and in India.

4.2 Participant recruitment

Social media, specifically Facebook were used to initially recruit participants. These were a network of friends in USA and India known to the researcher. On Facebook, two
closed groups were formed. The first group was entitled “Research USA” and comprised fourteen members. A second closed group was formed entitled “Research India” and comprised twenty members. A script was used to recruit participants. See Figure 11 for the Facebook script for recruiting participants. Follow-up emails were also used in setting up home visits.

Figure 11: Facebook script for recruiting participants
4.3 Participants

The first sets of participants were families of Indian origin in the United States, specifically Columbus, Ohio that were known to the researcher. Three families in Columbus were chosen for home visits. The second set of participants selected were families in India also known to the researcher. Five families in India, specifically New Delhi and Kolkata, were chosen for home visits.

The criteria used to select participants in the United States included the size of the participants’ homes (a home between 2000 – 3000 square feet was desired), the number of years that they had spent in the home (a minimum of five years was preferred), and a willingness to participate and to allow the researcher into their homes. This was because living in a smaller home and spending some years in the home would have allowed participants to have adapted and made changes to their home environment. The criteria used for selecting participants in India was similar but most important was their willingness to allow the researcher into their homes. The size of their homes and number of years they had lived in them was also important but became secondary. This was because the online (remote) response by participants in India was not as high as the researcher had expected and there was not room to be very selective on a tight time schedule.

4.4 Research materials

The research materials used included a survey, journal, floor plan sheets and emotional plan sheets. All of the material was prepared ahead and the same material was used in both USA and in India for consistency. Documentation of the research included
notes taken by the researcher, audio recordings, video recordings and photographs. Prepared verbal scripts were used for various stages of the research including: for participant recruitment, for setting up meetings; for initializing conversations at participants’ homes; for consent forms, etc. See Appendix A for verbal scripts used.

A survey went to a select group of homeowners in the USA and in India. The survey was first set up on surveymonkey.com with a set of questions aided at understanding changes that had been made to people’s homes and to help in participant recruitment. Some of the questions asked for the size of participants’ homes, the number of years spent in the same home, etc. Recruited participants were those who demonstrated a willingness to participate beyond answering the questions in the survey. Allowing their homes to be used for the research was needed in recruiting participants. A summary of survey response can be found in Appendix B.

Prior to visiting the recruited participants in their homes, a journal was sent to them. The purpose of the journal was to have home owners think about their homes in terms of their move into the home in the past, changes they had made over the years and to write down changes they planned for the future. The journal was also an attempt to delve into the emotional pasts of the home owners, such as the feelings that came to their mind when they thought of their home. The journal was, in essence, a probe to engage the participants in the process of thinking of their homes in terms that would later help in the at home interviews. The script that was sent for the journals remained the same for all participants, whether they were in the United States or in India. The journal contained scripted questions that were asked weekly for a total of four weeks after which point the
home visit would occur. The plan was for the completed journals to be returned to the researcher at the time of the home visit. See Figure 12 for questions that were asked in the journal.

Hello,
Thank you for participating in the study. This family journal is an important part of preparing for the home visit. The journal can be completed by the family as a whole, or members may contribute individually.

In the following pages are weekly tasks (2 per week), please read and complete as best as possible.

It is important that you do this every week to prepare for the study. I would be happy to send you a weekly email reminder!

I will collect the journal during our home visit.

Thanks!

WEEK 1 Close your eyes and think back to (11-15) years ago when you moved into your home. With your eyes remaining closed, walk through your home. After a few minutes, write down everything that comes to mind.

WEEK 1 Find photographs of your home when you moved in and put them in this page. If you can’t find any, describe or draw the condition it was in when you moved in.

WEEK 2 Think about the changes you have made in the last 5 years and describe them. Draw a floor plan if it helps you explain these changes. Add photos if you can.

WEEK 2 close your eyes and make a list of words that come to mind when you think of your home today. Write it down.

WEEK 3 What do you value most in your home? For example: privacy, space, any special objects or places etc.

WEEK 3 Add 3-4 photographs of your home as it is now. Include your favorite room. Describe each photo briefly.

WEEK 4 How would you describe your home to someone who has never visited? Use words, images, sketches etc.

WEEK 4 How do you see your home 5 years from now? What would be added/removed? If you could make any changes to your home, what would it be?

Figure 12: Questions asked in the journal

The floor plan toolkit and exercise utilized floor plan sheets and colored cut-outs.

Several 11x17 sheets were used for participants to put together a physical floor plan on paper. Cut-outs of square and rectangular shapes were provided for participants to create a floor plan that was an approximation of their home. The cut-outs were in gray, blue and yellow. Gray represented the home as it had been in the past, blue indicated the changes
that had been made in the home and indicated the home as it was in the present and yellow represented changes participants hoped to make to their home in the future. Colored markers were also provided in case the participants preferred sketching the layout of their homes. See Appendix C for physical floor plans constructed.

The emotional plan toolkit and exercise utilized a background sheet, images and words. For the emotional plans, blank 8.5x11 sheets that were tagged with gray (for the past), blue (for the present) and yellow (for the future) were provided to participants to make collages on. A set of images and words was provided to the participants who were told that they could interpret the images and words as representing their past, their present and their future. For example, an image of food being cooked could be interpreted as cooking done in the past, being done in the present or a desire to cook more in the future. See Appendix D for a complete set of images and words provided.

Documentation of the research done in the homes included audio recordings, video recordings and photographs. Along with written notes, at every home audio recording were made of questions asked and answered. The purpose of audio recordings was to help in recollecting conversations that occurred in the homes of participants and to act as an aid to the written notes.

Video recordings were taken as family members walked through their homes showing and talking about their homes, including changes that had occurred.

As part of the research materials used, photographs of rooms (as permitted) were taken. The purpose of photographs was to have a visual record of the homes. See Appendix E for photographs of homes.
4.5 **Floor plan and emotional plan toolkits**

The toolkit that was used in participants’ homes comprised of firstly, an 11x17 sheet of paper with accompanying cut-outs in gray, blue and yellow representing the past, present and future respectively. Families were given a choice of individually putting together floor plans or jointly putting together one floor plan. All eight families (three in the United States and five in India) chose to jointly assemble a floor plan rather than do it individually. For the second toolkit, participants were provided with 8.5x11 sheets of paper that were tagged with gray (representing the past), blue (representing the present) and yellow (representing the future) tags, six sheets of images and one of words. Participants were asked to individually or jointly put together an “emotional” plan. All families chose to put together these plans individually. The emotional plan was a means to connect the physical space the participants lived in with emotional associations to their home environment. It was also a method to engage the participants in thinking of their home environment holistically. Images of the finished floor plans and emotional plans are shown later in this chapter.

4.6 **Process**

Below is a sampling of the research process conducted with participants. The first is a pilot study that was conducted in Columbus, Ohio, USA. The second is a home study conducted in Kolkata, India. A color coding system was established to identify each family. In the USA, Columbus, Ohio, the pilot study family was designated “home blue”. The other two families in Columbus were designated “home green” and “home red”. In India, in New Delhi, the three families were designated “home yellow”, “home orange”
and” home purple”. In Kolkata, the two families were designated “home pink” and “home white”.

4.6.1 Pilot study

A pilot study was initially conducted with one family, “home blue” in the United States. A family representative (the main contact person) first filled out the survey. See Figure 13 for the survey response. A journal was also sent to the family to be filled out by one or all family members before the home visit. See Figure 14 for excerpts from the journal. Subsequently, the main contact person was asked about a suitable day for a home visit. The family was told that the research during the home visit would take approximately an hour. During the home visit the researcher sat down with consenting family members and read out a prepared script (see Appendix A), indicating that there would be a couple of participatory activities followed by a tour of their home. The researcher then explained what the first activity would involve.
Figure 13: Responses to survey questions made by “home blue” participant (the pilot study)
The family members read and completed consent forms and then participated in the session. Figure 15 shows the activity description and timing.
The first participatory activity was putting together the physical floor plan. The family, consisting of the husband, wife and adult son were given verbal instructions on how to proceed. They jointly assembled a floor plan on an 11x17 sheet using paper cut-outs that were provided. They used three different colors for their home to indicate how it had been in the past - using gray cut-outs, as it appeared in the present - with blue cut-outs and the changes they hoped to make in the future – using yellow cut-outs. The participants were asked to make additions or remove any space that they thought would
make the home work better. The participants were told that the floor plan did not have to be to scale and that there was no “correct” way to construct the plan. Markers were also made available for them to label the spaces that had been created such as “living room”, “kitchen”, etc. A time limit of approximately twenty minutes was given for this activity. While the family worked on putting together the floor plan, the researcher observed the activity, took notes and answered pertinent questions. Following the creation of the floor plan, the family was asked to describe and explain what they had assembled. The three family members jointly explained what had been created. See Figure 16 for an image and a rendering of the floor plan by “home blue”.

Figure 16: Image and rendering of floor plan by “home blue” participants (the pilot study)
The second participatory activity was putting together the emotional plan. Consent ing members were each provided with three 8.5x11 sheets of paper that had tags representing the past (gray), present (blue) and future (yellow). The participants were each provided with forty-eight images printed on six, 8.5x11 pages. The participants were also provided with thirty words printed on a 8.5x11 sticky back paper. The participants were told “use the word list and images provided to help convey the feel of your home and the emotions that go with it through your life stages of past, present and future in your home”. Participants were told that not all images or words needed to be used, rather, only images and words that meant something to them and best fit their evoked feelings of their past, present and future needed to be utilized. The participants put together collages using the images and words. A time limit of approximately twenty minutes was given for this activity. Subsequently, each of the family members was asked to individually talk about the collage he or she had assembled. Audio recordings were made to assist with notes taken during this process. See Figure 17 for the emotional plan assembled by the main contact person.
The third activity was a walkthrough of the home. The researcher walked through the home with the family and had them talk about the changes that had taken place in their home. The wife (the researcher’s main contact person) participated in this activity. This was an opportunity for the home owner to show changes that had been made over the years that they may not have thought of mentioning as part of the floor plan activity. This was also an opportunity for the researcher to observe the home. The researcher visually and with field notes documented the floor plan, the open public spaces versus private spaces, and other prominent elements within the environment, using notes, sketches, photo and video.

The feedback that was received from the family in the pilot study on the effectiveness of the interviewing process and the survey was used to make changes in methodology before interviewing the other families. Changes made for the home visits included giving
families a clear time limit at the start of each participant activity. A sheet with large “past”, “present” and “future” words written down with gray, blue and yellow cutouts for the participants to look at while assembling the floor plan was also added. This was a “key” to the color coding and a reminder to participants as they worked.

4.6.2 Home study

The home study done in Kolkata, with “home white”, was one of five conducted in India. A date and time was set up for the activity prior to leaving the United States. A journal was also sent to the family. See chapter 5 Figure 22 for excerpts from the journal. Adjustments were made to the participant activities conducted in India because participants requested more help from the researcher with constructing the floor plan and the emotional plan. This additional interaction allowed participants to be more comfortable with the activities. The participants in India also seemed more comfortable with talking about the process of constructing the plans as it was happening rather than at the end of the activity as had been planned originally and as had been conducted in the United States.

The first participatory activity was putting together the physical floor plan. The wife (the researcher’s main contact person) consented to participate in this activity. The researcher read the verbal script to the participant and worked with her in putting together a floor plan on a 11x17 sheet using paper cut-outs that were provided, to indicate how it had been in the past (gray), as it appeared in the present (blue) and any changes they hoped to make in the future (yellow). A time limit of approximately twenty minutes was given for this activity; the actual activity took longer as there were constant interruptions
by other family members and phone calls. See Figure 18 for an image of the floor plan and a rendering of the plan. Explanations of the floor plan took place as the floor plan was being assembled with the husband also contributing towards the explanation of it.

Figure 18: Image and rendering of floor plan by participant in “home white”

The second participatory activity was putting together the emotional plan. The wife (the researcher’s main contact person) participated in this activity. She was provided with three 8.5x11 sheets of paper that had tags representing the past (gray), present (blue) and future (yellow). She was provided with forty-eight images printed on six, 8.5x11 pages as well as thirty words printed on a 8.5x11 sticky back paper. The participant was told that not all images or words needed to be used; only images and words that meant something to her and would best fit needed to be utilized. The researcher helped her to put together collages using the images and words. A time limit of approximately twenty minutes was given for this activity. This activity also took a little longer than the assigned 20 minutes.
because of interruptions. The participant talked about the activity as she assembled the collage. Audio recordings were made to assist with notes taken during this process. See Figure 19 for the emotional plan assembled by the main contact person.

The third participatory activity was the home walkthrough: The investigator walked through the house with the husband and wife as they talked about the changes that had taken place in their home. The husband and wife showed changes that had been made and talked about their plans for the future. Their commentary provided more information than the floor plan. For example, they showed a shoe cabinet they had constructed to save space and a cabinet that, when opened, became a fully functional bar.

Figure 19: Emotional plan assembled by participant in in “home white”
4.7 Behavioral dynamics and cultural attitudes

A significant yet unexpected part of the research was in understanding and adjusting to behavioral dynamics and cultural attitudes in doing research in India as compared to the USA. In this section, the differences between doing the research with families of Indian origin in the USA and with Indian families in India are discussed. Figure 20 shows a comparison of some of the research activities that were conducted in USA and India.

<table>
<thead>
<tr>
<th>RESEARCH</th>
<th>USA</th>
<th>COMMON</th>
<th>INDIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Survey</td>
<td>Quick response - 11 out of 14</td>
<td></td>
<td>Slow response - 6 out of 20</td>
</tr>
<tr>
<td>Journal</td>
<td>2 out of 3 were returned</td>
<td></td>
<td>1 out of 5 was returned</td>
</tr>
<tr>
<td>Meeting set-up</td>
<td>Email set-up, formal approach, weekend preferred</td>
<td></td>
<td>Any day of the week fine, no preference for weekend</td>
</tr>
<tr>
<td>Home visit participation</td>
<td>Everyone participated</td>
<td>Socialize - meal, family invited</td>
<td>Women participated</td>
</tr>
<tr>
<td>Toolkit activities</td>
<td>Work first, then socialize</td>
<td></td>
<td>Socialize, then work then socialize</td>
</tr>
<tr>
<td>Timing</td>
<td>Stuck to time limit</td>
<td></td>
<td>Extended time</td>
</tr>
</tbody>
</table>

Figure 20: Comparison of responses to research activities in USA and India

The response to the survey was much better in the USA than in India. Eleven out of fourteen members responded to the survey in the United States. Six out of twenty members responded to the survey in India. The responses in India came only after writing reminders in Facebook for participation and after messaging many individual members. Immediate responses to messaging were received with members writing that they would
respond to the survey very soon, but they would typically not fill it out (even after the response).

Initially, when an email was sent to the main participants regarding the journal, all said that they would fill it out. But, two out of three participants wrote in the journal in the United States. One out of five participants returned the completed journal in India. When in India, participants were asked to complete the journal and return it to the researcher. They would say that they would, but it would not then happen. One of the participants said, “Why don’t we sit down together, I will talk about it and you can fill it out”. A meeting was set up to try this but the researcher was not successful in having the participant complete the journal.

When setting up the meetings, the researcher was asked to visit with her family and come for a meal in the USA and in India. In the United States, meetings were set up via email. Two of the participants preferred a weekend night, one preferred a weekend afternoon. For the research in India, since it was taking place in limited time, the researcher set up the meeting from the USA via emails, Facebook messaging and phone calls. Participants were open to the researcher’s visiting any weekday evening or any time over a weekend. In India too, the researcher was invited for a meal and for four out of five homes, her husband and son visited with her. The men would socialize while the women participated in the activities. The researcher’s eighteen year old son helped in taking the video in the homes.

Participation in the home visits in the United States involved the whole family, with family members sitting together and actively listening to the researcher for instructions
and then taking part. Participation in India, however, was mostly done by the main contact person. In some of the homes there was involvement by the children and sometimes the men participated, but it was not as methodical or shared as in the USA. In all three home visits in the USA, the husband, wife and children over eighteen participated. In India, in four out of five homes only the women actively participated. The husbands did not want to take part. The researcher tried asking them a few times, but then left it alone. In one home the spouse sat down for a minute then got up saying “this feels like homework, they know everything (referring to wife and daughter), I am just the driver”. But almost always, they would interject when the wife would describe the home or talk about changes that had been made. They would either add to what the wife had said or mention that it had been their idea to make a certain change. So, typically the men listened and then interrupted.

In doing the toolkit activities, in the homes in the USA, people would complete the activities first and then socialization would occur. In India, the researcher would first socialize for a while and then start the first participatory activity. The researcher would have to wait for the host to indicate that they were ready to get started, whereas in the USA the researcher could be the driver on the procedure. In India, toolkit methods needed to be changed and adapted based on the people involved. This seemed to be the nature of how things were done there. This could have been partly because there was a slight reluctance on the part of the home owners to get started on something they were not sure about. But whether in the USA or India, once started in the activities all participants were very engaged in the process. In the USA, the researcher did not help at
all with the putting together of the floor plan or emotional plan. In India, with all the participants, the researcher would also participate, helping with the cutting of images, gluing it on paper; this helped make the participants more comfortable and helped the flow of conversation. If specific questions were asked (in India), and the audio recorder turned on, the participants would not have much to say. But they would talk while assembling the toolkit, so the researcher would start discreetly recording. Some of the comments made in the USA included “we never thought of our home in this way” (reflecting on the past, present and future), “this is so interesting”. In India, the comments included “this is so much fun”, “how did you pick these images, they are perfect”, “this is the most interesting thing for me, I really want to talk about my house”. The home owners in India had great pride in their home and wanted to show the researcher all aspects of it. In one of the homes in India, after signing the consent form, the lady (“house purple”) said that her husband would not want me to go to the bedrooms and take photographs of those rooms. The researcher told her that only rooms she was comfortable with showing would be photographed and the researcher would stay in the public areas (living room, kitchen). But, once she started talking about her home, she took the researcher through every room, opened closets and drawers in the bedroom and encouraged photographs to be taken and later said, “I also had fun talking about all this with you”.

Timing in the USA was as planned originally by the researcher, about one hour for the research. In India, however no family stuck to the allotted time. In the USA, with all three homes the participatory activities took about an hour as had been anticipated. In
India, the time was extended because the participatory activities would constantly be interrupted with conversations, phone calls and attempts to make the researcher and her family feel comfortable with offers of food or drink. So, the sessions in India would last an hour and a half to two hours.

4.8 Summary

In total, the researcher visited three homes in the United States and five in India. Case study research was done in three homes in Columbus, Ohio and in three homes in New Delhi, India and two homes in Kolkata, India. Research materials included surveys, journals and tool kits for physical and emotional plans. Participants took part in three activities, putting together a physical floor plan of their home that showed how it had been in the past, the changes they had made since moving in and any changes they hoped to make in the future. Participants also put together an emotional plan using images and words that evoked in them a sense of their past, their present and their future. Participants then walked the researcher through their home and allowed photographs and video to be taken while they talked about their home and the changes they had made.

The next chapter describes the analysis that was done of the primary research and the findings from the analysis.
Chapter 5: Results

The previous chapter discussed the case study research that was done. This chapter discusses the types of qualitative data collected as part of the case study. It compares data collected in the USA with that of India, and concludes with a narrative on observed behavioral dynamics and cultural attitudes as well as a summary. As mentioned in the previous chapter, participants in the USA were of Indian origin.

5.1 Analysis of the case study research

Spreadsheets and process diagrams were created for analyzing the data collected. Data collected includes that from surveys, journals, physical floor plans, emotional floor plans, conversations with participants, photographs and direct observations. The varied data collected from different types of homes in two separate countries added to the challenge of analyzing it. This section begins with data collected from one family, “home white”. This is followed by a comparison of homes in the USA and India with a chart showing data of the homes. Data from the physical floor plan is shown followed by data from the emotional plan.

5.1.1 Research in India with “home white”

This section has an overview of the research process, including all the data collected from one family. The previous chapter contained a description of the research conducted in “home white” (Section 4.6.2). Family “white” consisted of four members, the husband,
wife, son and daughter. The son was away at college in a different city, whereas the
daughter was working in Kolkata and living at home with the parents. The wife’s parents
and brother lived in an adjacent apartment and there was a connecting door between the
two apartments. As mentioned in the previous chapter, the criteria for selecting
participants included the number of years they had lived in the same home (a minimum
of five years was desired so that they would have had time to make any changes). A
home with no more than 2500 square feet was also considered to be a constraint. A
willingness to participate and allow the researcher into the home was also needed. Data
collected from family home “white” - a home in Kolkata, India included the following
steps. A survey was initially completed. Figure 21 shows the survey that was filled out by
the wife of this family. The most relevant responses (to the criteria) are enclosed in red.
The location of “home white” was India. The participant family had lived in the same
home for more than 20 years. The square footage of the home was between 1000-2000
square feet. Changes made to the home included enclosing an open veranda. The purpose
of enclosing the veranda was to enlarge the bedroom.
Figure 21: “Home white” survey with most relevant responses enclosed in red boxes

A journal was completed by the wife and returned to the researcher during the home visit. See Figure 22 for portions of the home journal for this family. Black lettering indicates questions asked and the red lettering indicates responses. Two out of three journals were returned in the USA and only one out of five journals, this one, was returned in India. As a result of this, further analysis was not done on the journals.
A physical floor plan using the toolkit was created by the wife of the family with help from the researcher. The wife would talk about the home as she was creating the floor plan and the researcher would help in assembling it by cutting and gluing pieces to the 11x17 sheet. See Figure 23 for the floor plan created by the participant. Some of the narrative during the creation of the floor plan included commenting on the state of the home when the family moved in. At the time of moving in, the home was not very friendly to guests and not good for hosting parties. Now it was well-organized, with lot of
sun. Bump-outs in the living and dining rooms were created for a feeling of space, for guests to sit and for storing plates during parties in the dining area. Window grills were added for safety, but care was taken that the view was not disrupted. A door connected the dining room of this apartment to the living room in the parents’ apartment. For large parties, the parents’ living room in the adjacent apartment was used. A balcony was enclosed and made part of the master bedroom for more space, and a wall was bumped out to create a closet. The plan was to add more bump-outs for the future. The participant mentioned that she did not need privacy or private space ever, she loved being with the family all the time. Figure 24 shows the line drawing version of “home white” floor plan with photos of the home. Lines connect the photos to the rooms they describe.

Figure 23: “Home white” floor plan that was created by participant in Kolkata, India
The participant in this home was very cognizant of limited space and did not want anything extra. Her plan was to stay in the same home in the future. An emotional plan with images and words was also created during the home visit. See Figure 25 for the emotional plan with images and words created by the wife of the family.

Audio recordings were done during the assembling of the physical and emotional plans. This was followed by a video recording done with the husband and wife walking the researcher through the rooms in the home. Photographs of the rooms were also taken after the video recording.

This family had made many changes to their home by bumping out as many windows as possible, by repurposing the balcony, by added a soffit with lighting etc. Many creative solutions had been found in maximizing the space that they had. The wife was very practical and she thought of the home as a space for her family and friends. They cooked and entertained a lot. There were not many emotional connections to the past. There was more an observation that in the past the home had been very basic but that they had done it up over the years. The home had a very clean, neat layout with few knick-knacks and a place for everything. As they walked the researcher through the home, the couple mentioned that they had no excess stuff except for too many shoes in the children’s room. The wife mentioned that in this home they had only two bed covers that they interchanged in the master bedroom. (This was in contrast to “home pink” where the wife kept seven to eight bedcovers handy and would change them often).
Figure 24: Line drawing version of “home white” floor plan with photographs of the house.

Figure 25: “Home white” emotional plan with images, words and comments by participant.
5.1.2 A comparison of homes in the USA and India

Figure 26 shows a chart with summary statistics and descriptions of the homes in the USA and India. The homes were named blue, green and red in the United States and yellow, orange, purple, pink and white in India as a way to tag them and to protect the privacy of the home owner.

<table>
<thead>
<tr>
<th>DATA/HOMES</th>
<th>USA</th>
<th>Average</th>
<th>USA</th>
<th>Average</th>
<th>India</th>
<th>Average</th>
<th>India</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of home</td>
<td>Single family</td>
<td>Single family</td>
<td>Single family</td>
<td>Apartment</td>
<td>Apartment</td>
<td>Apartment</td>
<td>Apartment</td>
<td>Apartment</td>
</tr>
<tr>
<td>Number of people in home</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Age of home</td>
<td>&gt;20</td>
<td>&gt;20</td>
<td>16 to 20</td>
<td>16 to 20</td>
<td>16 to 20</td>
<td>20</td>
<td>&gt;20</td>
<td>&gt;20</td>
</tr>
<tr>
<td>Years lived in home</td>
<td>16 to 20</td>
<td>16 to 20</td>
<td>11 to 15</td>
<td>16</td>
<td>16 to 20</td>
<td>20</td>
<td>&gt;20</td>
<td>&gt;20</td>
</tr>
<tr>
<td>Square footage of home</td>
<td>2000 to 3000</td>
<td>2000 to 3000</td>
<td>2000 to 3000</td>
<td>2000 to 3000</td>
<td>2000 to 3000</td>
<td>2000 to 3000</td>
<td>2000 to 3000</td>
<td>2000 to 3000</td>
</tr>
<tr>
<td>Number of rooms (not including basement)</td>
<td>5 to 6</td>
<td>7 to 8</td>
<td>9 to 10</td>
<td>8</td>
<td>3 to 4</td>
<td>7 to 8</td>
<td>3 to 4</td>
<td>3 to 4</td>
</tr>
<tr>
<td>Room where most time is spent</td>
<td>Living room</td>
<td>Family room</td>
<td>Family room</td>
<td>Living room</td>
<td>TV room</td>
<td>Living room</td>
<td>Bedroom</td>
<td>Bedroom</td>
</tr>
<tr>
<td>Public space*</td>
<td>Living, dining, kitchen</td>
<td>Living, dining, kitchen, sunroom</td>
<td>Living, dining, kitchen</td>
<td>Living, dining, bedroom***</td>
<td>TV room, living, dining</td>
<td>Living, dining, bedroom***</td>
<td>Living, dining, bedroom***</td>
<td>Living, dining, bedroom***</td>
</tr>
<tr>
<td>Private space**</td>
<td>Bedrooms</td>
<td>Bedrooms</td>
<td>Bedrooms</td>
<td>Kitchen, Bedrooms</td>
<td>Bedrooms</td>
<td>Bedrooms</td>
<td>Bedrooms</td>
<td>Bedrooms</td>
</tr>
<tr>
<td>Approximate square footage per person</td>
<td>333 to 666</td>
<td>500 to 75</td>
<td>400 to 600</td>
<td>541</td>
<td>333 to 666</td>
<td>1000 to 1500</td>
<td>250 to 500</td>
<td>250 to 500</td>
</tr>
<tr>
<td>Number of rooms used on a daily basis/percentage</td>
<td>3/6</td>
<td>4/12</td>
<td>5/10</td>
<td>5/14</td>
<td>4/14</td>
<td>4/100</td>
<td>4/100</td>
<td>4/100</td>
</tr>
</tbody>
</table>

*Public space is defined as rooms open to visitors
**Private space is defined as rooms open to family
***Bedrooms become public when guests visit

Figure 26: Summary statistics and descriptions of the homes in USA and India

The type of home in USA was single family homes. The average number of occupants per home was three. The homes in India were apartments. The average number of occupants per home was also three. The average age of the homes in both the United States and in India was twenty. The average number of years the occupants had lived in the home in USA was sixteen. The average number of years the occupants had lived in
India was eighteen. The average square footage of the homes in USA was 2166. The average square footage of the homes in India was 1700. The number of rooms (not including a basement) on average in the USA was eight whereas the number of rooms in India on average was five.

Most time was spent in the family room in homes in the USA while most time was spent in the living room and bedrooms in India. The living room, dining room and kitchen was considered public space in homes in the USA. Most homes in India have the kitchen as a separated area with a door and it is not part of the public space.

Public space is defined by the researcher as rooms open to visitors. The living and dining room was considered public space in India. In three of the five homes in India this was one room. The bedrooms were considered private space in the USA and in India.

Private space is defined by the researcher as rooms open only to family. During parties, however, in India the whole home became public space including the bedrooms.

The approximate square footage used per person in a home in USA was 541. For the homes in India, the approximate square footage used per person was 406. The number of rooms used on a daily basis as a percentage was 53 in the USA, whereas in India was 88%.

5.1.3 Physical plan data

Line diagrams were created for all the homes based on the physical floor plans put together by the participants. Using line diagrams helped in making all the plans have a consistent format to help in analysis. Figure 27 through Figure 34 show the physical floor plans of the homes with descriptions following each of the figures.
"Home blue" participants live in Columbus, Ohio and were mentioned in the previous chapter as the pilot study participants. The home is a split level house with a square footage between 1000-2000 square feet. There is a living room and a kitchen with an open dining area. There are three bedrooms and two bathrooms on the upper level and there is a bedroom and bathroom in the basement level. There are currently three members living in the home. All three of them participated in the research. Over the years the family had increased natural light in the home with the addition of a skylight in the foyer and solar tubes in the master bedroom. A solar tube was also added in the passageway leading up to the bedrooms for sunlight to come in. The children’s bedrooms were converted to a study and guest room after the children had grown up and moved away. Currently, one of the adult children has moved back home and has his own
area in the basement. Energy efficient windows were added to the home. A new combined kitchen and dining room was created. The family mentioned that originally the kitchen was dark with pine cabinets, now it had changed to cream color cabinets. The family opened up the kitchen by removing walls. New hardwood floors were added, and an indoor grill was removed. For the future, the family would like to add an enclosed porch off the dining room and extend the master bedroom and add a deck.

Figure 28: “Home Green”, Columbus, Ohio

“Home green” participants live in Columbus, Ohio. The home is a two story house between 2000-3000 square feet. The home has a formal living and dining room, a kitchen, family room, breakfast area, sun room and half bath on the main level. The second floor has four bedrooms and two bathrooms. There is a finished room in the
basement. The family consists of four members. Three of the family members participated in the research. One son is in college and his sister is in high school. The son participated. Many changes had been made to the home. There was a change in flooring to hardwood. The family added a four season room, replacing a deck that had been outside the eating area. The basement was finished. The kitchen was renovated with new cabinets and a counter top. A new water heater, air conditioner and laundry appliances were added. New roof shingles were added. No changes were made to the top floor. For the future, the family would like to add a bonus room off the master bedroom.

“Home red” participants live in Columbus, Ohio. The home is a two story house and between 2000-3000 square feet. The home has a formal living and dining room, a
kitchen, family room, breakfast area and half bath on the main level. The second floor has four bedrooms and two bathrooms. There are two finished rooms and a bathroom in the basement. The family consists of five members. One son is in college and two other siblings are younger. Three of the family members – the husband, wife and one son - participated in the research. The homeowners had added new kitchen cabinets, counter, flooring and appliances. They added new hardwood floors in the formal living and dining room. A bathroom in the upper level was renovated. They mentioned that there were seven people in the house at a time. They considered adding a room for parents but the cost was too high. For the future, they would like to add an all season room. This family also wants to expand the master bedroom in the future.

Figure 30: “Home Yellow”, New Delhi, India
“Home yellow” participants live in New Delhi, India. The home is a one floor apartment between 1000-2000 square feet. The home has a living and dining room, a kitchen, two bedrooms and two bathrooms. Two of the family members participated in the research – the wife and the daughter. The changes that were made to the home included changed flooring, new windows and grill work. A door opening into a balcony was moved in the master bedroom. A store room had been made bigger when the daughter was young and used as her bedroom. Once she was older she had a separate bedroom and the store room was made smaller. The main participant did not feel as if the home was her own (i.e., her mother-in-law lives on the floor below) and they go to Goa (the husband has work there) often for privacy and to have their own space. Dinner is eaten at the dining table; all other meals are eaten in the living room with a tray.

Figure 31: “Home Orange”, New Delhi, India
“Home orange” participants live in New Delhi, India. The home is a two story apartment between 2000-3000 square feet. The home has three bedrooms, three bathrooms and a small sitting area in the main level. On the lower level is a physical therapy clinic with a separate entrance, a combined living and dining room, a kitchen, and a half bath. The family consists of two members, the husband and wife. The husband participated in the research. Their son and family used to live with them until they moved to another city. The daughter of the house works with her mother in her clinic on the ground floor. The daughter lives in a separate home but the grandchildren come to the home every week day after school. No structural changes have been made to the home. Furniture upholstery was changed. The whole home was painted and new furniture added to the home. They mentioned that it was not easy to make alterations to the home because of the materials of brick and mortar but the space they had was more than adequate. Grandkids had a designated room. No changes were planned. The participant stated that “we are in the mature stage of our lives and don’t worry about the future”.
“Home purple” participants live in New Delhi, India. The home is a one floor apartment between 1000-2000 square feet. The home has a living and dining room, a kitchen, two bedrooms and two bathrooms. The family consists of four members with one daughter in college and one son working. One of the family members, the wife participated in the research. Over time the family had enclosed two balconies, one to add more space to the living room and another to use as an extra bedroom. A sliding door with wood paneling was added to contain the air conditioning in the living/dining room (Indian homes have room air conditioners). The kitchen had shelving put in and rewired for appliances. This was a very food centric home; the focus was on the kitchen, dining table, and adding a hot plate for hot food for children. The mother was a very busy
accountant and she wanted to make sure the children were taken care of. Emotion was translated into food. (South Indians are not used to dealing with emotions, so food may be a way to show emotion). For the future, the home owner wanted a modern fitted kitchen and a remodeled bathroom.

Figure 33: “Home Pink”, Kolkata, India

“Home pink” participants live in Kolkata, India. The home is a one floor apartment between 1000-2000 square feet. The home has a living and dining room, a kitchen, two bedrooms and two bathrooms. The family consists of four members with one daughter working and one teenage son. One of the family members – the wife, participated in the research. Two bathrooms were renovated with a change in the flooring, toilet and sink. No structural changes were made to the home, although furniture, curtains and upholstery
were changing all the time. The home is painted every two years. For the future the home owner wants a modern kitchen and new flooring and windows.

Figure 34: “Home White”, Kolkata, India

“Home white” participants live in Kolkata, India. The home is a one floor apartment between 1000-2000 square feet. The home has a living and dining room, a kitchen, two bedrooms and two bathrooms. The family consists of four members with one daughter working and one son in college. One of the family members – the wife, participated in the research. The parents of the homeowner live in an adjacent apartment that has an interconnected door. Two windows in the living and dining area were bumped-out to gain square footage. A balcony in the master bedroom was enclosed to increase the size of the
A window in the master bedroom was converted to a closet. Section 5.1.1 discusses the data collected from this participant family in further detail.

5.1.4 Emotional plan data

Figure 35 shows a summary of the images that were selected and put together by the main participant in each home as part of the emotional plan. A spreadsheet with the images and words can be seen in entirety in Appendix F. The “home blue” (USA) participant, for example, selected an image of a young family with a baby as representing the past, images of food and clean interior space as representing the present and outdoor space as representing the future. “Home green” (USA) also selected the image of a young family as representing the past, outdoor space as representing the present and an image of a couple drinking tea as representing the future. The participant in “home red” (USA) selected an image of Ganesh (a Hindu God), outdoor space and cooking as representing the present, he selected a study space as representing the future. It is interesting to note that “home yellow”, “home purple” “home orange” and “home pink” participants in India all selected an image of Ganesh to represent the past, present and future.
Figure 35: Summary chart showing how emotional plan images were analyzed

Figure 36 shows a summary chart of comments made by participants regarding the images in the emotional plan exercise. For example, a comment made on an image depicting a young couple with a baby was “children’s growing years, no time to spend on the house. Children took up time”. A comment made on seeing an image of a couple drinking tea was “husband and I have tea and discuss the plans for the day every day, daughter joins on holidays”.

<table>
<thead>
<tr>
<th>Images/Person</th>
<th>USA</th>
<th>India</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blue</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Green</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Red</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yellow</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Orange</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Purple</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pink</td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td></td>
<td></td>
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<tr>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

| etc           |     |       |

72
Figure 36: Summary chart of comments made on images used in the emotional plan

Figure 37 shows a summary of the words that were used to express ideas in the emotional plan exercise by the main participants. The highlighted numbers show most frequently used words. The words “reading and ‘sunny” were selected eight times by seven participants. The word “cooking” was selected seven times. The words “open”, “warmth”, “guests” and “safe” were selected six times by the main participants.
Figure 37: Summary chart showing how emotional plan words were analyzed, with highlighted numbers showing most frequently used words.

<table>
<thead>
<tr>
<th>WORDS / PERSON</th>
<th>USA</th>
<th>INDIA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>P</td>
<td>P</td>
</tr>
<tr>
<td>Children growing</td>
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<td></td>
</tr>
<tr>
<td>Stroller</td>
<td></td>
<td>1</td>
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<tr>
<td>Backyard games</td>
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<td></td>
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<tr>
<td><strong>Family</strong></td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Storytelling</td>
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<tr>
<td>Games</td>
<td>1</td>
<td></td>
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<tr>
<td>Gardening</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Hobbies</td>
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<td>1</td>
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<tr>
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<td>1</td>
</tr>
<tr>
<td>Reading</td>
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<td>1</td>
</tr>
<tr>
<td>Sunny*</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Open****</td>
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<td>1</td>
</tr>
<tr>
<td>Books</td>
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<td></td>
</tr>
<tr>
<td>Music</td>
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<td>1</td>
</tr>
<tr>
<td>Smell of coffee</td>
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<tr>
<td>Clean</td>
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<tr>
<td>Warmth</td>
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<td>Calm</td>
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<td>Guests****</td>
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<td>Sharing</td>
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<td>Safe***</td>
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<td>Parties</td>
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<td>Fun</td>
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<td>Welcoming</td>
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<td>Comfort</td>
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</tr>
<tr>
<td>Quiet</td>
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<td>Individual space</td>
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<td>Privacy</td>
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<td>Cozy</td>
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<tr>
<td>Happiness</td>
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<tr>
<td>Own</td>
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</tr>
<tr>
<td>Small</td>
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</tr>
<tr>
<td>Big</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**NOTES:**
- Grayed words denote own words used, not words from provided list.
- **Family** includes more than just family.
- **Safety** includes safety
- **Open** includes open spaces.

8 6 4 2 2 5 5 3 2 12 14 11 3 6 1 2 4 0 4 8 5 4 10 2 125
5.2 Comparing USA and India

This section contains charts on home changes and a summary and graph of these changes. This section also contains an overview of the eight physical floor plan diagrams created comparing the USA with India followed by an emotional plan summary.

5.2.1 Home changes

Figure 38 contains a chart of all the changes that were made to all the homes. The content of the chart is based on a compilation of data sources: responses to the survey, conversations with the participants and through observation of the participants’ homes.

![Figure 38: Chart of all the changes made in all the homes](chart.jpg)

Figure 39 shows a summary chart of home changes showing differences between USA and India, broken up into past, present and future and Figure 40 provide a summary of the changes that were made to the homes, showing the differences between USA and India.
Figure 39: Summary chart of home changes showing differences between USA and India, broken up into past, present and future

<table>
<thead>
<tr>
<th>HOME CHANGES/COUNTRY</th>
<th>USA</th>
<th>INDIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remodel</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>New room</td>
<td>X</td>
<td></td>
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<tr>
<td>New Paint</td>
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<td>X</td>
</tr>
<tr>
<td>Flooring</td>
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<td>Windows</td>
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<td>X</td>
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<tr>
<td>Air conditioning</td>
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<tr>
<td>Adding porch/deck</td>
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</tr>
<tr>
<td>New bathroom</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>New kitchen</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Increased square footage</td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

NOTES:
USA: The home changes shown represent 2 out of 3 families that selected them
INDIA: The home changes shown represent 3 out of 5 families that selected them

Figure 40: Summary chart of home changes showing differences between USA and India
As shown in Figure 39 and Figure 40, the home owners in USA tended to make changes in terms of adding a new kitchen, new bathroom, painting and remodeling with a need for increased square footage in the future. Most of the home owners in the USA who wanted the increased square footage wanted to add to their bedroom, add a den or bonus room as a study. Their reasons for increasing the space were to accommodate guests, increase privacy, be more open, add natural light, etc. This was also indicated when they completed the emotional plan and used images to make statements such as “but I want a work area for myself, now it is shared” on including an image of a study, by home owner in “home red” and “focusing more on self” on including an image of a backyard by home owner in “home green”.

As shown in Figure 39 and Figure 40, the home owners in India made changes such as adding air conditioning - most homes have room air conditioners. In three out of five homes there had been remodeling done to increase the usable space or by repurposing existing space, for example, by enclosing balconies to increase the area of a bedroom (“house white”) or converting a veranda to a study/bedroom (“house purple”). The owners wanted to add new paint, change upholstery for sofas, add new pillows and change flooring for the future. This was to increase the comfort of the existing space. One home owner (“home pink”) wanted a large single home in the future in a town by the sea (in Gopalpur).

5.2.2 Physical plan changes

Figure 41 shows an overview of all the home line diagrams created for USA and India that were based on the physical plans created by participants, conversations with
participants and observations by the researcher. The scale of all the diagrams is proportional. As can be seen at a first glance, the relative sizes of the homes in India are much smaller than the ones in the USA. In comparing USA with India diagrams, people in USA homes want increased space in the future, participants in India want changes but not much increased space. Most changes in India pertained to new windows and flooring.

Figure 41: Overview of home line diagrams created for USA and India
5.2.3 Emotional Plan

Figure 42, Figure 43 and Figure 44 contain summaries of the emotional plans with a comparison between India and the USA. The images and words of two out of three families were selected to make a summary statement for USA and three out of five families were selected to make a summary statement for India. In Figure 42, a chart of the emotional plan showing differences between USA and India in terms of past, present and future is shown. In the USA, the image of a young couple with a baby was selected as representing the past. Outdoor space is important in the present for USA home participants. “Family” and “warmth” were words selected in the past in the USA and “cooking” an important part of the present. “Warmth” was selected for the future. In India, the same image of a young couple was selected as representing the past. “Reading” was selected as representing the past. Cooking is also an important activity for Indians (in India) in the present. An image of “Ganesh” (a Hindu God) was selected by at least three out of five home owners in India.

In Figure 43, if one looks at the USA and India without the past/present/future designations, USA images are more about the outdoors and India images depict indoors. Cooking is a big part for both Indians in the USA and in India and guests are important to both. Warmth and sunshine also seem important to both Indians in USA and India.
Figure 42: Summary chart of emotional plan showing differences between USA and India in terms of past, present and future

<table>
<thead>
<tr>
<th>EMOTION</th>
<th>PAST</th>
<th>PRESENT</th>
<th>FUTURE</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td><img src="image_url" alt="Image" /></td>
<td><img src="image_url" alt="Image" /></td>
<td><img src="image_url" alt="Image" /></td>
</tr>
<tr>
<td>Family</td>
<td>Cooking</td>
<td>Warmth</td>
<td></td>
</tr>
<tr>
<td>INDIA</td>
<td><img src="image_url" alt="Image" /></td>
<td><img src="image_url" alt="Image" /></td>
<td><img src="image_url" alt="Image" /></td>
</tr>
<tr>
<td>Reading</td>
<td>Cooking</td>
<td>Warmth</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Guests</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Welcoming</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Comfort</td>
<td></td>
</tr>
</tbody>
</table>

NOTES:
USA: The images and words shown represent 2 out of 3 families that selected them
INDIA: The images and words shown represent 3 out of 5 families that selected them

In Figure 44, the diagram shows the USA and India with the common images and attributes in the center and unique images and attributes filling out the rest of the circles. These images and words are all the ones selected (without the designation of past, present and future) by two out of three families in the USA and three out of five families in India. The image of a young family with a child and the words cooking, warmth, guests and sunny were common to participants in both USA and India.
Figure 43: Summary chart of emotional plan showing differences between USA and India

<table>
<thead>
<tr>
<th>IMAGES/WORDS</th>
<th>USA</th>
<th>INDIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Cooking</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Warmth</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Reading</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Guests</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Welcoming</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Comfort</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Sunny</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Open</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Music</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Clean</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Safe</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Quiet</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Individual space</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Separate</td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

NOTES: USA: The images and words shown represent 2 out of 3 families that selected them
INDIA: The images and words shown represent 3 out of 5 families that selected them

Figure 44: Visual chart of emotional plan showing differences between USA and India
5.3 Behavioral dynamics and cultural attitudes

The researcher found several commonalities and differences in the behavior and attitudes in doing research in the USA and India. Figure 45 compares the homes between USA and India in terms of the physical and emotional attributes.

<table>
<thead>
<tr>
<th>Attributes</th>
<th>USA</th>
<th>COMMON</th>
<th>INDIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical Home</td>
<td>Private space - bedrooms</td>
<td>Puja (prayer) room or area</td>
<td>Private space - bedrooms (becomes public during social events)</td>
</tr>
<tr>
<td></td>
<td>Public space - living, dining, kitchen</td>
<td>Natural light</td>
<td>Public space - living, dining</td>
</tr>
<tr>
<td></td>
<td>Kitchen - in middle of home</td>
<td>Cooking for family</td>
<td>Kitchen - separate from dining</td>
</tr>
<tr>
<td></td>
<td>Future plans - extra bonus room for privacy, guests</td>
<td>Socializing with family and friends (friends become family in USA)</td>
<td>Future plans - fix up existing rooms</td>
</tr>
<tr>
<td>Emotional Home</td>
<td>Socializing occurs on weekends</td>
<td></td>
<td>Socializing occurs on any day of the week</td>
</tr>
<tr>
<td></td>
<td>Family members visiting stay average 4-6 months</td>
<td></td>
<td>Family members live adjacent or in apartment below, not in same home</td>
</tr>
<tr>
<td></td>
<td>Need for privacy and space part of decision making</td>
<td></td>
<td>Need for closeness, never a need for privacy part of decision making</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Safety/security very important</td>
</tr>
</tbody>
</table>

Figure 45: Comparison of the physical and emotional attributes of the home between USA and India

There are a number of characteristics in common between the USA and Indian homes. All homes visited, in the USA and in India, had prayer (puja) areas or rooms. In all homes visited, participants indicated a desire for natural light. “Having a room full of natural light is appealing” was a comment heard from a member of “home red”, in Columbus, Ohio, with other family members agreeing with him.
Home and cooking were synonymous in most homes visited, in India and in the USA. As mentioned in the previous chapter, the researcher and her family were invited for a meal when initially setting up the home visits in both countries. Most of the home changes in “home purple”, in New Delhi, India were planned around cooking and food. The first changes made to “home purple” were the adding of shelves to the kitchen, adding extra outlets for appliances and creating an area in the dining room for food to be easily accessible by the children. As the home owner mentioned, “I look forward every day even now (to returning home) like a bird returning to the nest and start planning about dinner when driving back”.

In the homes observed in the USA, bedrooms were considered private space. This was true for homes in India also. However, in all the homes visited in India, during parties, the whole home (except the kitchen) becomes public space and is open to all. Typically, the master bedroom was where the children gathered to watch TV or to play video games. When visiting the homes in India, initial reluctance gave way to pride in showing the home. For example, in “home purple”, the participant was initially hesitant to show the entire home. She said that her husband would not like pictures to be taken of the bedrooms. The researcher consented to take pictures of the public space (living and dining area) but in the process of talking about her home, the participant took the researcher to all rooms and encouraged her to take photographs. Public space in the USA was the family room, living room, dining room and kitchen.

The kitchens in all homes visited in the USA were in the middle of the home, adjacent to family rooms. In homes in India, the kitchens were located off the dining
room but were separated by a door that was usually shut. In the homes visited in India cooking was an everyday occurrence, and often times, meals were cooked several times a day. It is possible that the kitchen is separate because of the many meals being cooked on a daily basis. Usually maids were also in the kitchen assisting with the cooking (and not interacting with visitors). This could also be a reason for keeping the kitchen separate in India. When visiting “home white”, in India (a home with four family members), the researcher was shown a separate cupboard in the kitchen that had sauces, spices, etc. that were used by the husband of the home for when he wanted to cook. The wife commented, “this is his rack – full of masalas and sauces. He cooks a lot and everything is in his arm’s length”.

In all the homes visited in the USA, the plans for the future included additional space and increased privacy. In “Home Red” - a home with five family members and in-laws who visited for several months in a year- the participant commented regarding finishing a basement that “the expanded basement was for guests. The children were growing up and needed their own rooms”. His comment regarding wanting a Florida room for the future was, “I want an expanded social space, this is not in the plans for the future, but I want a work area for myself”. In the homes in India, all the available space was used, with washing machines being placed in bathrooms, with storage under beds, etc. But most of the families were not looking to add more physical space; they were planning changes in terms of changing windows, re-painting the home or purchasing better sofas. In two of the homes visited in India, “home orange” and “home purple”, there was mention of having purchased recliners and the increase in comfort because of this.
In homes visited in the USA, all socializing was planned for weekends. In the USA, Indian friends become extended family and friends meet often. The frequency increases if there are any festivals (such as Diwali, a Hindu festival of lights or Navaratri, a nine day Indian festival), and families meet Friday through Sunday. Typically, the Indian families in USA only meet on weekends or holidays. In India, people meet any day of the week and there is no preference for weekends. For example, the researcher was invited to visit “home pink” on a Thursday evening. The plan was to reach the home at 7 PM, allow one hour for research and then have dinner. Two other families (known to the researcher) were invited to come at 8 pm for dinner. The research started late because the participant had another guest visiting and also wanted to make the researcher’s family comfortable with offers of food, etc. The research was completed at around 9 PM, at around which time the other guests arrived. Appetizers and drinks were then served and dinner was completed after 11:30 pm. The next day was a working day for everyone, but no one was in a hurry. One of the guests offered to drive the researcher and family back to the hotel (and the researcher took them up on the offer).

Safety and security was a major concern for people whose homes were visited in India. The participant in “home purple” said “safety is a very important aspect of this home. I had the comfort level because I used to leave the children home with the maid”. Window grills and the placing of them becomes an important physical feature of the homes. In “home yellow” the grills had originally been painted white, later repainted to black and then polished. In “home white”, the grills had been placed on the outside of the window, to give the home more space and to have a better view of the outside. See Figure
46 for images of window grills in “home yellow”, “home pink” and “home white” in India.

Figure 46: Images of window grills in “home yellow”, “home pink” and “home white”

5.4 **Summary**

This chapter covered the analysis that was done of the case study research. A comparison of data in USA and India was done with the help of spread sheets and diagrams. The next chapter discusses the main conclusions from the analysis of the research, the implications of the research for design and future steps.
Chapter 6: Conclusion

Interior space in homes is impacted by many elements and circumstances. Factors influencing creative and innovative design in homes include physical space, emotional factors, culture, and sustainability. Non-designers also play a vital role in interior space design. This chapter highlights key findings from the case study research of the domestic home environment. Key findings, implications of the research for designers and a discussion of future work to be done by the researcher and a summary are discussed below.

6.1 Key findings

In chapter 1, the introduction showed a visual figure representing the initial search (Figure 1). What the researcher wanted to discover, understand and explore were the processes of innovative design in the home environment. Factors influencing innovative design were considered to be culture and perception, emotional factors and sustainability.

In chapter 2, mention was made of a model by Toby Israel of a pyramid of housing needs (Israel 2010). Figure 47 shows a diagram that reveals how the researcher’s findings relate to this model. The changes made to homes in the USA were more a result of wants (planned) whereas the homes in India made changes as a result of needs (emergent design). On the lowest level, “home as shelter” meets the needs for both homeowners in
USA and in India. In the homes in the USA, safety and security was assumed and did not drive design decisions by the homeowners. But, safety was a very important concern for home owners in India and drove design decisions. An example of this was given in the previous chapter with regard to window grills (Figure 46). At the level of “home as psychological satisfaction”, the homes in the USA met the needs of self-expression. For example, in “home Green”, the sun room that was built increased visibility to the outdoors that the home owners wanted. The homes in India on the other hand, gave the home owners a sense of belonging. For example, the home owner in “home orange”, in New Delhi, felt that their home was “comfortable, functional for clinic, more scenic, nice to sit out, lots of birds”. At the next level up, “home as social satisfaction”, privacy and independence needs were met for USA homeowners. For example, in “home red”, the basement was finished and a bathroom added so that visiting guests could have their own area. For the homeowners in India, socialization and the need for togetherness drove some design decisions, for example, in “home white”, two of the bump-outs made were to accommodate the seating of guests and for storage of plates, etc. during parties. On the next level up, “home as aesthetic satisfaction”, the home owners in USA expressed satisfaction in their homes but thought changes would make the home better. The home owners in India mostly thought that their homes met all their needs and did not plan to make major changes. At the top most level, “home as self-actualization”, the home owners in USA felt that their homes met all their spatial needs but there was room for change. The home owners in India thought their homes were almost perfect and met all their needs.
The case study conducted resulted in additional factors that affected the home environment. Physical space acted as an influence in the design of home environments. What made the design emergent in addition to being just creative and innovative were the constraints imposed by physical space, particularly in India. For example, in “home purple” in New Delhi, India, two siblings were sharing a bedroom and there was never enough space for both of them to study in the same room. A veranda that was off the bedroom was converted to a bedroom/study for the daughter to use as a reaction to this situation of living. See Figure 48 for an image of the converted veranda.
The main findings from the case study research are summed up in Figure 49.

Physical space changes in the USA were done within the existing space and extensions were added to homes because of wants. For example, the kitchen in “home blue” in Columbus Ohio had changed cabinets from dark wood to cream colored because the
owners thought the room felt dark and closed in. The change was made because of a want for change and to open up the area. Changes in India are made more as a result of needs. For example, the kitchen in “home purple” in New Delhi, India was rewired with additional outlets so that appliances such as the microwave and toaster were plugged in and within easy reach of the children, without their having to constantly unplug and plug the devices. The change was made because of a need for safety and so that the children could be independent, while the mother was away at work. See Figure 50 for images of the kitchens in “home blue” and “home purple”.

Figure 50: Want for change in “home blue” versus a need for change in “home purple”

When looking to the future, research participants in the USA indicated a desire to increase the square footage of their homes in order to enlarge their space. Physical space
changes in India were done mostly within the constraints of the existing space of the home, that is, modifications of the existing space rather than extensions were done.

Emotional connections to homes in both USA and India were similar when participants thought of the past, in that it was remembered as a time with a young family, and not much time was given to making changes in the home. For the present, for both USA and India families, cooking and guests were important considerations. Tradition and religion played an important part in homes in India and was more overt than in homes in the USA. For example, in “home orange” and “home purple” in India, there were references made to Diwali (a Hindu festival) as being an important time to decorate and paint their home. In “home pink” there were many different areas in the living room that had idols of Ganesh (a Hindu God). For the future, participants in the USA were looking forward to privacy and to outdoor spaces. Participants in India, on the other hand, looked to safety and warmth for the future. In the emotional plans that were completed, participants in India gave more emphasis in recalling the past and considering the present and gave less thought to the future. Participants in the USA however gave as much emphasis to the future as they do to the present (see Figure 37 and Figure 43 in chapter 5). Figure 51 shows a wordle using all the words that were selected by participants (in USA and India) as part of the emotional plan. The words that were most often used by participants in USA and India to indicate thoughts on their past, present and future in relation to their home environment were “reading” and “sunny”, followed by “cooking” and “clean” followed by “family”, “open”, “warmth” and “safe”. 
Cultural norms were different in doing research in the USA versus India. In the USA, the whole family participated in the research and it was conducted as soon as the researcher visited the participants’ homes. In India, only the women actively participated (with one exception). But the men indirectly participated by listening in on what the women were saying and either correcting or adding to the information. Research in India was also approached after some socializing. Cultural norms in the USA seemed almost the opposite with everyone being very business-like right away and socializing later.

In terms of sustainability, people in the homes in USA had added Energy Star appliances after remodeling their kitchens. Solar tubes had been added to increase natural light (see “home blue”). Participants had been staying in the same home and enlarging it rather than moving to bigger homes. People in India did not make a conscious effort at sustainability, but by reusing and adapting to the same space over many years, they were being sustainable. For example, balconies were enclosed to provide a study/bedroom (see “home purple”), a store room was converted to a child’s rooms when the child was young.
and reconverted once the child was older (“home yellow”). All homes had washers (located in the bathroom) and not dryers because of a lack of space for extra appliances and because it was easy to air dry clothes. This resulted in less electricity wasted, as well.

6.2 Implications for designers

Changes made in people’s homes were done mostly by non-designers and done as a result of living in the spaces, experiencing them, adapting to them and coming up with solutions. For example, in “home white”, a lack of closet space was addressed by demolishing a window and enclosing it to make it a closet. Design becomes emergent because of external needs that make change occur. Planned design occurs because of wants, with internal desires to make a change. For example, adding a solar panel because of wanting more natural light (“home blue”, USA) or wanting to add a sun room because of wanting expanded social space (“home red”, USA). Emergent design on the other hand is a result of less design and planning and is more externally driven, with external needs causing the change. For example, a lack of space because of children sharing a room results in converting a veranda to a study/bedroom (“home purple”, India). In other words, the reason for action is a want (in planned design) versus a need (in emergent design).

The implication for designers is that general ideas constructed by designers about space planning need to be continually rethought. For example, designers typically gather information from clients regarding their needs and use the information to come up with an architectural program (to define the required functions of the project) in the schematic phase of the design service. This is then followed by the design development phase where
proposals are generated. However there should be continual interaction between the practical experiences of non-designers and the theoretical ideas of the designers. User experiences should contribute to the design of the interior space. The designers should brainstorm with clients and make the interaction participatory by hearing clients’ ideas rather than presenting themselves as the only experts with all the solutions. Some of this is occurring through design charrettes (with professionals and clients working together on design scenarios), but typically this does not happen and it does not address changes that need to happen over time as circumstances change.

Design training for designers has provided inadequate tools to understand and address the psychological aspect of design (Israel, 2010). Research done with participants in their home environments revealed that emotional factors related to their past, present and future affected the design choices in their homes. For example, in “home white”, the participants perceived their home in the past as not being friendly to guests and for parties. They made changes and felt that the home in the present had a lot of warmth, was fun and was perfect.

6.3 Future work

A concept map showing the progress from initial exploration to research to future plans is shown in Figure 52. The case study research started with certain assumptions. The initial exploration showed additional directions of study such as the impact of cultural norms, which were unexpected, especially since all the families that participated had grown up in India. Further research into the impact of cultural norms in interior space in different cultures is an area the researcher would want to pursue in the future. In doing
research in the USA, the population of convenience was families where the couples were professionals. Almost 40% of all Indians in the United States have a master’s, doctorate or other professional degree (wiki.com). One can probably expect similar results if a larger group of Indian families in the USA were selected. In comparing the homes with those of India, three of the couples in India were professionals and two running their own businesses. This would probably be typical of a certain class of people in India and the research done could be generalized to this population. Thus, the research can only be generalized to families such as Indian families settled in the USA, professional, middle-class, in this country for more than five to ten years. To be able to generalize more broadly, families would have to be drawn from a broader (wider) more diverse pool. If the study were to be expanded to other types of families, for example, immigrants from other countries, the results could be different based on their socio-economic status, education, social integration, etc.

The methodology followed for the research was a case study method. This allowed exploratory but in depth insight into a few homes using a population of convenience (that is, all participants were known to the researcher). The researcher would be interested in broadening the population using a different methodology such as a survey based research, potentially combined with the use of social networking media. The researcher would also want to go in depth into specific aspects such as culture or emotion. This would be done by doing a detailed case study but drawing on people from different cultural backgrounds, going in-depth into their ties to their homes that they grew up in and comparing it to their ties to their current homes in the United States.
6.4 Summary

This thesis was done in an attempt to understand interior space design between emerging and developed economies. Research was done in homes of people of Indian origin now living in the USA and others living in India. The key findings show that the many similarities between people of Indian descent living in the USA and India lie in cooking meals, in opening up their homes to family and friends, in making changes to homes and being proud to show what the homes have become. A large part of the differences lie in cultural norms and behavior. For example, the Indians living in the USA had been influenced by living here for many years. There is a need for privacy, of socializing only on weekends, of wanting to take advantage of outdoor spaces by building sun rooms. The homes in the USA were much larger than the homes in India.

The researcher wants to acknowledge that there were limitations in the study. As mentioned in Chapter 1, research in the USA was done in suburban homes whereas the
research in India was done in apartments in urban cities, in order to compare similar populations of professionals. Many attitudes towards the space and reasons for differences found could have been a result of inherent limitations in space and resources in the Indian settings. If, for example, a study had been done in urban apartments in major cities in the USA and been compared with the study done in India the results may have been different. Having said that, the cultural differences the researcher found between USA and India did not appear to be because of space constraints; rather there was a shift in mindset. For example, in “home orange”, in India, a two story home with a living and dining room on the ground floor and a small sitting area and three bedrooms on the first floor, the family always gathered in the small sitting area near the bedroom. More chairs were brought in as more people visited. Only for main meals did people go downstairs. Similarly, in “home white”, an adjacent apartment where the home owner’s parents currently lived in had been lying vacant for many years. But, the home owner had only used the extra space when giving parties, preferring to use her small apartment for daily living.

Much insight was gained in understanding the role of non-designers in transforming their spaces. For example, in “home blue”, solar tubes had been added in the bedroom and passage to increase natural light. In “home yellow”, in New Delhi, India, a store room had been extended from the bedroom to the dining room and converted to a child’s room. Once the child grew up, it was reconverted back to a store room.

The research helped in understanding how constraints allowed creativity to act as a catalyst in interior space design. In homes visited in the USA, the home owners had been
living in the same home for many years and were not planning to move to another home in the near future. They were content in the neighborhood, school district and community. These constraints meant that they had made changes over the years and adapted to the space rather than move. In homes visited in India, the constraints came from a lack of space and a difficulty in making changes to brick and mortar homes. As a result, these constraints allowed for innovative changes to be made.

New areas of research methodology evolved, for example, participation at a distance followed by face-to-face interaction with participants in the USA and in India. The researcher set up all the initial interaction remotely with participants and then followed it up with face-to-face visits. Social media was used to a large extent in interactions. This made for a more efficient and lower cost study. But, the people in India were more responsive at face to face participation, so the limitations of social media also became apparent.
Bibliography


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Appendix A: Scripts and forms
Facebook script for participant recruitment

1. Dear friends and family,

I am working on "design innovation in India and how space evolves with resource constraints" for my graduate thesis. As part of the study I am conducting a survey. Your input and participation in this study would be an invaluable resource for me. The survey should take no longer than 10-15 minutes. Although every effort to protect confidentiality will be made, no guarantee of internet survey/email security can be given as, although unlikely, transmissions can be intercepted and IP addresses can be identified. You will not be identified by name in any thesis, report or publication resulting from this study.

For questions about your rights as a participant in this study or to discuss other study-related concerns or complaints with someone who is not part of the research team, you may contact Ms. Sandra Meadows in the Office of Responsible Research Practices at 1-800-678-6251 or 614-688-4792.

For questions, concerns, complaints, or if you feel you have been harmed as a result of study participation please feel free to contact Priya Ramnath at ramnath.2@osu.edu

Participation is voluntary, and you may stop at any time, refusal to participate will involve no penalty or loss of benefits to which you are otherwise entitled. No risks are anticipated for the participants for the research. No direct benefit to individual participants is anticipated.

Thanks in advance for your help!

Priya

Please click on the link

https://www.surveymonkey.com/s/86JMXF7
Online script for participant recruitment

2. Dear XX,

Since you indicated in the survey that you would be willing to participate further in the study, I wanted to get in touch with you. Your input and participation in this study would be an invaluable resource for me and I really appreciate the opportunity to talk to you further about this topic.

The research would be a design activity followed by a walkthrough of your home with you and your family members (older than 18). The at home research should take no longer than 45 minutes to 1 hour. Prior to the home visit, I will send you a journal to complete. This will take about 30 minutes to do so. I wanted to check your availability for an in-home visit over the next 2 weeks [for India, December 17th through 27th].

Although every effort to protect confidentiality will be made, no guarantee of internet survey/email security can be given as, although unlikely, transmissions can be intercepted and IP addresses can be identified.

For questions about your rights as a participant in this study or to discuss other study-related concerns or complaints with someone who is not part of the research team, you may contact Ms. Sandra Meadows in the Office of Responsible Research Practices at 1-800-678-6251 or 614-688-4792.

For questions, concerns, complaints, or if you feel you have been harmed as a result of study participation please feel free to contact Priya Ramnath at ramnath.2@osu.edu

Participation is voluntary, and you may stop at any time, refusal to participate will involve no penalty or loss of benefits to which you are otherwise entitled.

No risks are anticipated for the participants for the research. No direct benefit to individual participants is anticipated.

Thank you in advance for your time and your interest in this project.

Regards,

Priya

Consent form attached for you to read. I will bring copies to our in home meeting for you to sign.
Consent form

Before participating in any research activities, please read the following information:

The purpose of this study is to explore how Interior space evolves under resource constraints. No risks are anticipated for the participants for the research. No direct benefit to individual participants is anticipated.

The research activities will take approximately 1 hour 15 minutes to 1 and 1/2 hour.

I will perform the following activities:

- Contribute to a journal that will have prompts for me to write about.
- Put together a floor plan on 11x17 sheets with the shapes, words and images provided. This portion will be audio recorded and photographs will be taken.
- Walk through my home and talk about and show changes that have been made over the past 5 – 10 years. This portion will be video-taped and photographs will be taken.

While I am participating in the above activities, my opinions, comments, photographs, audio recording and video footage will be used only in a summary of the final results that will be provided to a representative of the OSU Design Research team. My name or identity will not be published or presented.

Compensation

I will not be compensated for my participation.

Freedom to withdraw

I realize that research participation is completely voluntary. I am free to refuse to participate in this study or withdraw at any time. There is no penalty for either non-participation or withdrawal.

Availability of researchers

If I have questions or concerns about the research, or if I feel I have been harmed as a result of study participation I may contact Priya Ramnath at: ramnath.2@osu

For questions about your rights as a participant in this study or to discuss other study-related concerns or complaints with someone who is not part of the research team, you may contact Ms. Sandra Meadows in the Office of Responsible Research Practices at 800-678-6251.

Consent

My signature below indicates that I consent to participate in this research

______________________________________________________________
participant name (print)        participant signature        date
______________________________________________________________
researcher name (print)        researcher signature        date

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Verbal script for the in-home session

Thank you so much for allowing me into your home and participating in this research study. Your participation is helpful to me as this study is for my graduate thesis in understanding how a space evolves creatively with resource constraints. For this first part, in front of you are 11x17 sheets that each of you can complete jointly. This would be the physical floor plan:

- The paper cut-outs I show resemble your room shapes approximately. Use them to put together a floor plan of the home. Use the gray to represent the past, blue to represent any changes you have made and yellow to represent changes you hope to make in the future.

- Use the markers provided to write the type of room being represented

- Add anything you feel would complete the home, any additions or removal of space that you think would make the home work better.

Are there any questions before we begin? You will be given the opportunity to explain your choices verbally at the end of the task. For this second part, in front of you are sheets that each of you can complete individually or jointly. This would be the emotional floor plan:

- Use the word list and images provided to help convey the feel of your home and the emotions that go with it through your life stages of past, present and future in your home.

Now that you have completed the task, could you each talk about your choices and selection for your sheet. I am going to record this as you speak. For this third part, I would like you to walk me through your home and point out the changes that have been made over time to adapt to your needs. I will take some notes, photographs and video as you talk about your home. Could you provide me with any feedback on the whole process? Thank you so much for participating!
Appendix B: Survey summary
13. Do you have a favorite room?

<table>
<thead>
<tr>
<th>Room</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Living</td>
<td>26.6%</td>
<td>4</td>
</tr>
<tr>
<td>Dining</td>
<td>11.3%</td>
<td>1</td>
</tr>
<tr>
<td>Kitchen</td>
<td>37.4%</td>
<td>6</td>
</tr>
<tr>
<td>Bedroom</td>
<td>12.5%</td>
<td>2</td>
</tr>
<tr>
<td>Office</td>
<td>1.1%</td>
<td>1</td>
</tr>
<tr>
<td>Garage</td>
<td>1.1%</td>
<td>1</td>
</tr>
<tr>
<td>Other (please specify)</td>
<td></td>
<td>5</td>
</tr>
</tbody>
</table>

14. Please explain why it is your favorite.

<table>
<thead>
<tr>
<th>Response</th>
<th>Count</th>
</tr>
</thead>
</table>

15. Were any of the changes or additions below made to your home?

<table>
<thead>
<tr>
<th>Change</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remodeling</td>
<td>44.2%</td>
<td>9</td>
</tr>
<tr>
<td>Repainting</td>
<td>17.7%</td>
<td>2</td>
</tr>
<tr>
<td>New Fencing</td>
<td>33.3%</td>
<td>9</td>
</tr>
<tr>
<td>Flooring</td>
<td>15.5%</td>
<td>4</td>
</tr>
<tr>
<td>Stairs</td>
<td>17.7%</td>
<td>1</td>
</tr>
<tr>
<td>Window</td>
<td>17.7%</td>
<td>1</td>
</tr>
<tr>
<td>Air conditioning</td>
<td>30.8%</td>
<td>6</td>
</tr>
<tr>
<td>Larger floor</td>
<td>17.7%</td>
<td>2</td>
</tr>
<tr>
<td>Adding bedrooms</td>
<td>17.7%</td>
<td>1</td>
</tr>
<tr>
<td>Adding windows</td>
<td>6.9%</td>
<td>9</td>
</tr>
<tr>
<td>Enclosing spaces</td>
<td>14.3%</td>
<td>2</td>
</tr>
<tr>
<td>New bathroom</td>
<td>6.9%</td>
<td>9</td>
</tr>
<tr>
<td>New office</td>
<td>31.5%</td>
<td>6</td>
</tr>
<tr>
<td>Other</td>
<td>1.1%</td>
<td>1</td>
</tr>
<tr>
<td>Other (please specify)</td>
<td></td>
<td>5</td>
</tr>
</tbody>
</table>

16. If changes were made, was there an increase in livable space?

<table>
<thead>
<tr>
<th>Response</th>
<th>Count</th>
</tr>
</thead>
</table>

17. If yes, what was the reason behind it and the approximate increase in square footage?

| Response | Count |

18. If no to increased square footage, please explain what changed and reason behind it.

| Response | Count |

19. Is there anything else you would like to add about the evolution of your home?

| Response | Count |

20. May I contact you to discuss your participation in the next step of this research regarding how the interior space in your home has adapted and evolved over the years? This would include a sit down interview at your home with you and your family members (only those above the age of 18) followed by a walk through of the home. It will take about 45 minutes to an hour.

| Response | Count |

21. If yes, please provide contact information to get in touch with you - email or phone number.

| Response | Count |

22. If no, what are your thoughts on the changes and their impact on your home?
Appendix C: Physical floor plans and emotional plans
USA - HOME GREEN

USA - HOME RED

INDIA - HOME YELLOW

INDIA - HOME ORANGE

INDIA - HOME PURPLE

INDIA - HOME PINK
Appendix D: Images and words in the emotional plan toolkit
<table>
<thead>
<tr>
<th>WARMTH</th>
<th>SAFETY</th>
<th>CLEAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>GUESTS</td>
<td>SHARING</td>
<td>CALM</td>
</tr>
<tr>
<td>SMELL OF COFFEE</td>
<td>COOKING</td>
<td>BIG</td>
</tr>
<tr>
<td>PRIVACY</td>
<td>HIDING</td>
<td>QUIET</td>
</tr>
<tr>
<td>HOLIDAYS</td>
<td>WELCOMING</td>
<td>COMFORT</td>
</tr>
<tr>
<td>SOCIAL</td>
<td>INDIVIDUAL SPACE</td>
<td>FUN</td>
</tr>
<tr>
<td>SAFE</td>
<td>REFLECTION</td>
<td>READING</td>
</tr>
<tr>
<td>OPEN</td>
<td>SELF</td>
<td>OWN</td>
</tr>
<tr>
<td>MUSIC</td>
<td>SUNNY</td>
<td>SEPARATE</td>
</tr>
<tr>
<td>TRUE</td>
<td>FAMILY</td>
<td>PROTECT</td>
</tr>
</tbody>
</table>
Appendix E: Photos of homes
USA – HOME GREEN
INDIA – HOME PINK
Appendix F: Spreadsheet of emotional plan
<table>
<thead>
<tr>
<th>USA</th>
<th>INDIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blue</td>
<td></td>
</tr>
<tr>
<td>Green</td>
<td></td>
</tr>
<tr>
<td>Red</td>
<td></td>
</tr>
<tr>
<td>Yellow</td>
<td>1</td>
</tr>
<tr>
<td>Orange</td>
<td></td>
</tr>
<tr>
<td>Purple</td>
<td></td>
</tr>
<tr>
<td>Pink</td>
<td></td>
</tr>
<tr>
<td>White</td>
<td></td>
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</table>

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