

Session A-2 Family Care 3

Lone Fathers: The Unconventional

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1. Introduction

The family in India is a near universal social institution. It is considered to be a private domain where the nations' important values are nurtured. As most people live in a family its commonplace presence makes it sensitive to critical inquiry. There is a tendency to think that there will be a threat to society's cherished values if the family is questioned (Uberoi 2005). Family studies in India for a long time focused on a broad categorization of family into elementary and joint. The elementary family is composed of a man, his wife and children. A joint family means two or more elementary families joined together. The debates centered on the impact of modernization on the joint family. The work of Shah (1998) necessitated its distinction with the household to show that the joint family was not really disintegrating. There has however been a conspicuous shift to the interest in the family as an important site for inequalities in contemporary India. This has brought into focus the position of women in conjugal relations, division of labor within the household and the primary socialization of the children. In this paper there is a shift to men in a family form that is prevalent amongst a very small percentage of the population of the capital city of India and is seen as an incomplete elementary family or can be called the lone parent family¹.

In the dynamics of the Indian family, parental roles and responsibilities are culturally defined (Kakar 1981, and Ramu 1987). Most accounts of Indian families point to an incompetence of Indian husbands, towards care which is culturally defined. In the Indian patriarchal family traditions there are role bifurcations such that women are relegated to the domestic sphere and are the primary caregivers and men by and large maintain a distance from care giving and domestic work (Roopnarine, Lu, & Ahmeduzzaman, 1989). Although there is change in the dynamics of the family and other ways of living are visible yet the heterosexual institution predominates and patriarchy continues to be the norm. The institution of marriage continues to be the only legitimate structure of the family. Any attempt at challenging this is seen as threat to the social order (Sen, Biswas, Dhavan 2011).

In this paper an attempt is being made to see how Lone fathers (Lf) are taking care of their children without the mother of the child. Beyond the role of the bread earner, Lf are involved in arenas of nurturing and care. They are taking care of the children in the absence of the child's mother and are doing 'routine' care work for their children. They are not only doing this as a sense of duty but because fatherhood for them is an important extension of the self. Since the role of father as a primary caregiver is unconventional according to the norms of society I want to understand if Lf are facing any

challenges in playing this role. Since Lf are the primary care givers of the children and also bread earners are they able to maintain the work/care balance. Care within a household includes both, care for children and house work. It can have positive consequences for the person who receives it but have costs for those who provide it since it has to be combined with work outside the house. Additionally since patriarchy is played at multiple levels one of the problematic is to understand whether patriarchal structures interpellate the agency of Lf as well. This can be seen in the light of the immense importance attached to the institution of marriage not only for women but also for men such that men who are 'outside' the institution of marriage are sometimes seen to be challenging the norms of society. The focus of the paper however is on how Lf are playing the unconventional role of care giver and the ways in which they are involved in the expressive and instrumental tasks of child rearing. I also seek to understand how this basic father-child unit in which instead of the conventional other, there are many others, both kin and non kin, are creating 'larger families' which are structured differently and what are the implications that this has for gender roles.

2. Research design

Lone father families of an urban (New Delhi), upper middle class/middle class setting in North India where fathers' who were earlier married and now separated/divorced from their spouses, are a part of this study². Widowed fathers are not a part of the study as choice rather than circumstances was to be the basis of their being lone. Most Lf though said that it was not necessarily 'choice' that was the deciding factor in their separation/divorce. Implicit in the use of the term lone rather than single is that lone parents are said to have deviated from the norms of society hence they do not enjoy its support. Educated Lf who had separated for three years or more and whose children are residing with them in separate households were contacted through various methods. They were visited in their homes so that they could be seen interacting with their children. In-depth discussions were also held with the Lf.

The difficulties faced in studying lone father families were many. As a result of the conventional notions there are not many single fathers who remain single over a period of time. Single fathers usually remarry hence are difficult to locate³. Lone father families where the father and the children were residing alone were difficult to locate especially if the child was a girl child⁴.

3. Fathers' transition to the primary care giver

Fathers have been the less common primary caregiver in the past, presumably due to the father working most of the day resulting in less bonding with the children, or possibly a young child still needs to be nursed and the mother seemed to be better suited for childcare while fathers were in economic activity. Some Lf however said that they were already involved with some form of childcare before their divorce which varied from playing with the child mostly in the presence of the women

folk or taking care of the child when the mother was involved in other activities. But their actual physical and emotional involvement with their children started only after their child began to reside with them without the child's mother. The transition from becoming a father to the primary care giver involved various tasks which the fathers were unaware of due to their own socialization hence the process was gradual and not automatic.

Rahul a Lf who is in the teaching profession consciously chose his single status. Sometime after their son was born his wife asked for a divorce⁵. Rahul said that her decision took him by surprise. Though she could not give a reason for her decision to separate, he agreed but on the condition that he would take his son with him. He felt that she was confused and so he did not want to leave the child with her. Initially she resisted but once it became clear to her that he was not going to relent she agreed. Rahul moved out of the house with his six year old son. Hence forth the purpose of his life became the care of their son. He did not want him to be affected by their decision. Apart from the fact that Rahul and his son lived in a different house, Rahul tried to keep everything else in his child's life constant. Despite pressure from family and friends Rahul did not to remarry (even though his wife remarried) as he thought that it might further lead to a change in his child's life. He rented a house close to the house in which they earlier resided even though it was very far from his own work place. He bought a car (even though he was ideologically against it) so that he could ferry his son and his friends to and fro from school. Rahul's relationship with his in-laws remained intact. No event in their house was 'complete' without him. (Contrary to the north Indian culture he performed their last rites which, though were done along with his son). Initially Anita (the help) who had been assisting his mother in laws, was sent with them. Unfortunately Anita hit the bottle so she had to be sent back. 'That was a sad day as she was a part of our family'. After that Rahul did the entire house work and care of his child. Rahul was one of the Lf who used to share childcare with his wife yet it was not easy given the fact that he was the solo care giver and also the bread earner.

...It was like working double shift. Multitasking all the time. Right from getting him ready for school, preparing his breakfast and dropping him to school and then going for work himself. After school I would pick him up, prepare his lunch and supervise his home work. His friends would come over to play and I would complete the household chores. My career took a back seat... I also faced financial difficulties. But... it was my decision.'

Sidhant another Lf who was pursuing a modeling career took a conscious decision to parent alone, so he adopted a child. Describing the adoption process as cumbersome he said that there is still a perception that single parents (especially fathers) cannot do responsible parenting. After becoming a 'dad' his life changed and he became a more disciplined person.

The transition to becoming a caregiver for these fathers was gradual, even though they were already 'fathers'. The experience of Lf reinforces the fact that they are breaking out of the conventional moulds and carrying out tasks which were earlier in the preview of the women like giving every day care to children and bonding with them at an emotional level.

3-1. Doing routine work for the children

In recent decades an increasing amount of theoretical effort has gone into broadening our conceptions of what fathers do for their children beyond the basics of providing for their financial needs. Lamb's (2000) threefold typology of engagement, accessibility, and responsibility has had enormous influence on the literature on father involvement. By engagement he means hands-on activities, such as helping with homework; accessibility refers to fathers' physical availability and monitoring; and responsibility signifies his ownership over tasks and decisions related to childrearing.

Lf were involved in the everyday care of the children especially during infancy. According to Kakar (1981) infancy is a demanding period that requires intense care giving and during which the Indian mother is highly indulgent with the child. Likewise demands on Lf were high when their children were infants. Differences exist within Lf but most are hands-on fathers. Irfan a pilot by profession whose daughter was all of 3 years old, when she started to live with him without the mother. Though challenging he said that bringing up his daughter had been a very amazing experience. His wife and he agreed to get divorced when their daughter was one year old after which his ex wife requested Irfan to take care of the child since she wanted to pursue a career in modeling. He readily agreed but now attributes it to a decision related to his youth. He fondly remembers taking her for work and sometimes even for important meetings. His work though gave him flexi time and he was also able to cook meals for her.

...that was before she reached adolescence. I was anxious about the biological changes and often asked her if she needed colored underpants. Her answer would be 'no not now but I will tell you when I do' even at that age she understood what I was talking about.

The day she got her first period she was waiting me to tell me, I understood even before she told me. 'After sharing the excitement...I cried...my little baby had grown up'. He decided to change his occupation as he felt that taking care of children especially a girl child involved a lot more responsibility. 'It was difficult to explain to her not to talk to strangers while I spoke to women who were strangers to her'. He then mostly worked from home which he admitted created problems and he subsequently lost a lot of money. That he said did not seem to be of much importance compared to the fact that he had succeeded in bringing up his daughter well. He said that from a very young age she

had begun tell him how to run the house more economically. In fact if he got friendly with a woman his daughter would grill him about his divorce and say 'why not my mother'. He fondly remembered the times when she was a young girl and they travelled together. People asked if she was his girlfriend since it was difficult for them to comprehend that a father could be on holiday with his young daughter (without the mother).

Routine care then means emotional involvement, physical presence, time and effort on the part of the parent. Gender of the child also throws up different issues for the care giver and LF devised ways of dealing with such issues. The discussions then turn to how LF are creating meaningful networks of relations with kin and non kin and the ways in which these practices both follow and challenge traditional expectations for family life.

4. The Larger Family

The father-child unit is the basic unit of the lone father family. This larger family is not 'structured' the way two parent families are and instead of the mother there are the many 'others' who form a part of the 'larger family'. Though both kin and non kin are included in the larger family yet it is the non kin who form an important part of this father- child unit.

4-1. Father- Child unit

Lone parent families also have implications for the socialization of the child. Family according to Parsons (1955) is the primary agency for socialization. Although family plays an important role in the early years, the learning process continues throughout life (Beteille 1991). Arun aspiring for a career in politics and whose daughter was 12 and son was 10 years old when he separated from his wife. Both children took on responsibilities around the house. His son would often get on a table to roll the 'rotis' (Indian Bread). His daughter helped Arun take care of her younger sibling. Even as a child she did not do things just because girls were supposed to do them. Marriage did not figure as the primary goal in her future plans and she told her father that she would marry only if she found the right 'boy', someone who would agree to take care of him(father). She wanted to get a degree in management and Arun's son wanted to become a chef. They planned to open a restaurant where all three of them could work together.

Regarding day to day issues maintaining the balance between discipline and friendship for LF and the child is sometimes challenging. There is a loss of the 'echelon structure' which is a feature of two parent families and children become more like peer which might not be psychologically good for either the parent or the child⁶. The experience of fathers with their children shows that the children are being not being socialized in the stereotypical manner. In fact children grow up seeing their fathers in the kitchen and going out for work, playing the role of nurturer and provider. Unlike children in

conventional families the children in lone parent family forms are not socialized into fixed gender roles and have the potential to learn in a different family setting.

4-2. Parent's of Lone fathers: responsibility and resentment

The parents of Lf extend support after the break in their son's marriage, especially their mothers⁷. Despite the love for their grandchild they are not very happy with the added responsibility of bringing up a child just when they are otherwise ready to retire in their old age. Instead they would have expected their son and his wife to take care of them. Hence they put pressure on their son to remarry so that they can pass on the responsibility of the childcare to his wife. Irfan said that his parents had got a lot of marriage proposals for him which he had declined. Infact his father has recently offered to start a business and get a 'lovely' house for him if he agreed to marry. They were also upset about the fact that Irfan did not have a son who could carry their family name forward. Though they had two daughters and grandsons but in patriarchal societies of North India it is the son who carries the name of the lineage. This created a lot of tension between Irfan and his parents such that when he spoke to his father he referred to himself as their nalayak (good for nothing) son.

There is a socio-cultural expectation that sons will take care of parents in their old age even though daughters also extended support to their natal families after marriage. It is this stereotypical expectation that causes resentment in the minds of the parents' even though there may not be any direct conflict with their sons⁸. The other relationship that continued to be problematic is with the ex spouse, but for the sake of the children some Lf work on it.

4-3. Ex- Spouse: A workable relationship

The ex spouse/ the mother of the child did not play a very active role in the lives of the Lf families. Lf like lone mothers shared a bitter relationship with their spouses after the separation. This relationship continued to be problematic though for the sake of the child they tried to work on it. Amit a Lf who was in a business enterprise with his friend and whose younger child was with his ex wife and the older one with him, tried to maintain a cordial relationship with her. He said that he paid a monthly allowance to her and also for the education of the child. He said that he had to sell the house he was living in so that he could take care of the expenditure of three households⁹. His wife whom he had helped set up a business was now doing better than him but she still expected him to pay for all the expenses. He had just bought a car for them as when he bought a car for himself his car his younger son too asked for a car. He said that his ex wife had tried to reconcile with him five years after their separation as she did not want a divorce. For the sake of the children he agreed. Yet he made it clear to her they would be living in separate bedrooms. But it did not work as she would pick up a fight not only with Amit but also their older son who had refused to stay with her.

Lf made a distinction in the relationship between their ex wife with whom their relationship could never be the same and the mother of their child with whom they were in a sense forced to keep a relationship for the sake of the children. For Lf it was the support of non kin that was valuable and whom they considered to be family.

4-4. Friends: The lifeline

'Life is hell without friends' was the status of a lone father on a networking site. Lf said that they liked to spend time with friends. Friends for lone mothers were someone they could depend on for day to day affairs; for Lf friends' were to 'hang out' with. Ajay father of a 15 year old and an engineer by profession but who operated a property firm because of the flexibility in work hours it gave him said that the only way to relax was to be with friends. Narrating an incidence he said once a friend and his wife came to stay with him and the man hit his wife in the bedroom. Ajay intervened and asked his friend to either behave or leave his house. He counseled the wife and asked her not to live with a man who did not know how to respect women. His was an 'open house' for his friends but he wanted some decorum to be maintained in the house lest they become a nuisance for the neighbors.

Friends for most Lf's were the ones with whom they were sharing an emotionally reciprocative bond. This more than the relationship with the kin as is the norm in most conventional families is what constitutes family for them.

4-5. The help: The outsider-inside

Lone parents referred to 'the help' by their name or as a relationship and connected with them like family. The help then, though neither kin nor friends of lone fathers, were described as a part of their larger family¹⁰. Rana who was working with a multinational firm at the time of his separation and whose stayed son and daughter stayed with him even though his wife had legal custody of the children, introduced the help as jivini (the one who helps sustain life). He said three generations of her family had lived with his patrilineal family and even though she was unwell he did not want to send her back to the village as she would not be taken care of over there. It was reassuring to have her around he said just like it was to have a parent. The other members of his family were the watchman, plumber, electrician who even if he called in the middle of the night they would leave everything and be by his side. Not for the money but because of the relationship he shared with them.

Lf seemed to have an orientation that was 'outward' as they were not just restricted to members within the family. The meaning of the family for them has transcended to relationships beyond the kin¹¹.

5. Consequences for the lone fathers

Lf are said to be promoting norms of an individualistic ethos. Despite trying to create larger families, which because they are differently structured than the conventional two parent family, they are often considered to be going against the norms of society. The emotional and financial cost at which they are taking care of their children is seldom considered.

5-1. Home and work

Finances are often a source of anxiety for lone parent families. Lf like lone mothers are involved in the routine care of the children and find it difficult to be involved in a demanding career. Furthermore since childcare activities are more of a barrier to workforce participation it is also difficult for lone fathers to be the primary care giver and bread earner. Hence Lf found it difficult to be in jobs which were demanding as they required flexible work hours. Ambition and careers took a back seat and routine work took precedence. Vijay who was working as a manager in an export house and whose wife left the house, on the pretext of going out of the country for some work, to never return, became a passive acceptor¹². He took care of their 8 year old daughter but it was difficult as he did not have flexible work hours. His boss though sympathetic to his situation could not offer much help. The child's security was a major concern and Vijay had to move close his parent's house. Vijay's mother took on the responsibility of the child in his absence. He even handed over most of his earnings to his parents. The grand parents took care of the child's security concerns but could not fulfill her emotional needs. Vijay was busy taking care of the financial needs of the family and his own needs of companionship. Despite trying his best he could not take care of his daughter the way he would have wanted to.

The problems faced by Vijay reflect the problems of most lone parents. There are no concessions at the work place for lone parents' particularly lone fathers. People at the workplace even if sympathetic cannot do much as they are no laws separate protecting the rights of lone parents. Since there is a stereotype regarding the roles of parents the law does not take into consideration the needs of Lf. Thus it becomes difficult for a lone parent to bring up a child without support even if he wishes to do so.

To deal with such issues some lone parents have formed self help groups. They felt that being part of a group with similar concerns helped them cope with issues related to child care. Sanjay who had a professional degree worked in his father's firm as it gave him flexible time. He is the father of a 12 year old boy. He said that he was a part of an informal single fathers' support group in which they address issues common to their situation. They meet once in a while and even organize joint outings. Rana another Lf said that his son's friends' and their parents always went out together. A lone mother and her daughter was also a part of the group. This helped his son realize that there were others who had similar family forms.

5-2. Marriage and Masculinity

The association of marriage with masculinity creates a stereotype painting all non married men with a similar brush¹³. If even though married, on separation, get 'branded,' as is the case with single unmarried men. The unmarried status of men casts a shadow on their masculinity and there is pressure on their 'sexuality'. In a society where there is a high value placed on marriage and fertility not only for women but also for men, unmarried men, as well as women are seen as a threat to society.

The divorced men considered in the study, though married and had children living with them, were still considered a threat to society. Irfan said that 'married men considered him to be a threat around their wives'. He married his girlfriend when he was only 21 years old after she told him that she had become pregnant. He had the marriage registered in a back date. The marriage lasted for two years and they separated by mutual consent. Even as a child his daughter hated seeing him with other woman so he decided that he would not get married. He got into innumerable relationships that would eventually break and people especially married men became uncomfortable around him. Society considers such men to be a threat to the social order since there is no check on their behavior as marriage and family are considered to be institutions within which men's sexuality is (supposedly) contained.

Chowdhry (2011) in her study in rural Haryana found that unmarried young men and men past their youth if still unmarried, are slotted and accorded an inferior status¹⁴. This was also found to be true of the Lf in the urban areas. Vijay whose wife left at the pretext of going abroad for a job, said that his status in his house was that of an 'irresponsible' person. His father thought that he was incapable of taking important decisions because his 'love marriage' had failed. Men who are unable to control their women are considered to be weak as the exercise of power is considered to be a sign of manhood. So men who could not 'keep' their wives were considered to be less masculine as it is assumed that their wives did not submit to their power. Masculinity then has multiple indicators the most important of which is marriage.

5-3. Loneliness and sexuality

According to Uberoi (2004) there is avoidance on discussions related to sexuality in India. Contemporary work on sexuality problematises the notion that sexuality is a world unto itself. A consequence of this thinking is that sexuality is treated like a private 'thing' that is disconnected from the public domain (Srivastava 2013).

If discussed their relationships with their women friends in a more casual manner and the secrecy that surrounded such discussions with lone mothers was absent. They readily discussed their need for a sexual relationship. 'I have a girlfriend in every city. I think being single is better than being in one relationship for life', said Rohit. Rohit a businessman whose son and daughter stayed with him said that men had sexual needs and for him too that was important. His ex wife though he was sure

was not seeing anyone and he wondered how women are able to manage without something so vital to the existence. He said that he got into a relationship twice after his separation and had just got out of the second relationship. As a result of his 'activities' his daughter was sent to her mother. The Lf's attempt at discussing multiple relationships seemed a subtle way of dealing with issues of masculinity.

Lf's said that they understood the 'syndrome of the empty nest' and could empathize with mothers' who spent their entire lives around children. Lf primary reason for not remarrying was their children as the child was their primary responsibility. Once the children grow up there is a certain emptiness but that does not necessarily mean being lonely said Rana. Another Lf was saddened by the fact that his daughter has gone for a higher education to the country where her mother now lives. 'Not to be with the mother but for a better education. My dogs are now my family. I travel a lot and but whatever part of the country I am in I Skype and connect with my babies. I live to come home to my babies... you need not have a human to communicate with'. I am the the envy of my friends as I am 'free' and don't have any commitments'. Though with a far away look in his eyes he did say that his life would have been very different if it had not been for his daughter. Yet there was no resentment that his daughter was enjoying her life without him. He looked forward to her being with him soon.

Loneliness and issues of sexuality of Lf are not really a point of discussion as they are considered to be the private concerns of a group of individuals who are considered to be an anomaly of society.

6. Conclusion

Challenging conventional notions, Lf are playing the role of bread earners and care givers. Though they were already fathers before their separation/divorce yet their transition to becoming the solo caregiver is a process that requires them to be engaged with their children, much more than is expected of men in the Indian context. Giving them physical and emotional care they involve themselves with the children at various levels. The experience of lone fathers shows that they share circumstances similar to mothers' in bringing up children as compared to fathers' in two parent families. In trying to creating a balance between care and work lone parents are unwittingly reinvention gender roles and this can have wider implications for gender relations.

The larger families that they have succeeded in creating are 'outward' in orientation. The basis unit of these families is the father-child unit and instead of the conventional other there are the many others not necessarily the kin. This then is a witness to the fact that Lf are not promoting an individualistic ethos. These families with their diffuse authority structures and flexible gender roles are not structured like the patriarchal family. Though not large in number, lone father families could be prompting us to rethink the family.

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Notes

¹ According to data, widowed /separated /divorced men are clubbed together and constitutes 1.7 % of the total male population of Delhi No data however was found for single father families.

² The thrust of my thesis is urban upper middle/middle class Lone parent (father /mother) families. However since lone fathers are difficult to find hence 11 lone fathers are a part of the study.

³ Jalan (2010), a comparison can be drawn with the study of single parents in Germany which showed that single fathers usually remarry.

⁴ Since care is still in the purview of the (joint) family in India and the norm is for sons to continue to stay with the parents after their marriage, it is the responsibility of the grandparents to take care of their grandchild and more so if the marriage of their son breaks.

⁵ All names are pseudonyms

⁶ Goffman (1966) An echelon structure consists of a hierarchy in which one individual has authority over another.

⁷ Kakar (1981) argues that in the Indian system mother son bond is emphasized over the husband wife relationship.

⁸ Das (1995) the duality of the family is expressed on the one hand as a site of oppression and on the other hand as a 'haven in a heartless world'.

⁹ Amit's elder son lived with him. But when his son went to do engineering in another city he fell ill so Amit rented a house for his son and his widowed mother in the city in which his son was studying. His wife and younger son lived in another house bought by Amit.

¹⁰ Uberoi, (2005) researchers may sometimes not include non-kin like servants in enumeration of household, who contribute critically to household maintenance.

¹¹ Palriwala (2011) Love in which there is expectation of return is considered to be corrupt love.

¹² See O'Brien (1982)

¹³ A single status though is equated to being unmarried but data shows that was also the case for divorced men.

¹⁴ Chowdhry, (2011). It is not only the women but also the men who may find it difficult to live up to the stereotype of a patriarchal structure. The unmarried youth are considered of an inferior status and are sometimes slotted as problem creators.

Changes in the Direction of Intergenerational Support Flows in Turkey, A Country at the Onset of Aging: Evidence from Turkey Family Structure Survey, 2006 And 2011

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1. Introduction

In Turkey, the results of the demographic research carried out in last 40 years have shown that family structure is on the way of transformation from extended to nuclear families. Although family roles are changing and families are losing the feature of being a buffer institution in elderly care and protection in Turkey, both parents and children still prefer to live in the same neighbourhood with their families to provide support to each other.

Based on the changes in family roles in Turkey, parent-child and child-parent relations are complicated as both parents and children need intergenerational support. However, the question of who is supporting whom remains an unanswered question. This paper investigates the direction of intergenerational support flows in Turkey that defined as a country at the onset of aging.

This study analyses the direction of intergenerational support flows on the basis of two concepts; 'functional solidarity' and 'associational solidarity' borrowed from Bengston and Roberts based on their study published in 1991.

In the first part of the paper, demographic changes in Turkey will be covered in order to shed light upon how the dynamics of intergenerational support may change in a country at the onset of aging based on the changes in demographic and familial structure. In the second part of the paper, data and methods used for this paper will be analysed and in the last part of the paper, the results will be discussed in the light of the demographic changes in Turkey and how the direction of intergenerational support changed in five years period will be understood based on the data comes from two different Turkey Family Structure Surveys conducted in 2006 and in 2011.

2. Changes in Demographic and Family Structure in Turkey

Demographic researches carried out last 40 years in Turkey indicate that since 1970s total fertility rate in Turkey has been declining continuously. While total fertility rate was 5 births per woman in 1970, it declined to 2.2 births in 2003, and stabilised at this level in 2008 and 2013. As a result of decline in fertility, young population consisting of people below 15, is decreasing. While this group was consisting of the 41% of whole population in 1935, it declined to 25% in 2013. In parallel to fertility decline in Turkey, the elderly population has a tendency to increase. While the proportion of elderly population (65+) was only 3-4% in 1975, currently,

population aged 65 and over constitutes 8 in Turkey (approximately 6 millions) and it is expected to rise to 9% in 2023, 21% in 2050 and 28% in 2075 according to the population projections conducted by Turkish Statistical Institute (TURKSTAT, 2013).

When the proportion of elderly population was compared to other age groups, it was seen that elderly population had higher growth rate. In 2013, while the growth rate of total population in Turkey was 13.7%, growth rate of elderly population was almost triple with 36.2%. Any other indicator, old age dependency ratio is number of elderly persons per 100 people at working age groups. While the number of elderly persons that were needed to be taken care of per 100 working people was 11 in 2013, this number is expected to be 19 in 2030. Both demographic data and elderly indicators show that Turkey is losing its young population structure and is turning to an old population structure.

Demographic researches carried out in Turkey also indicate that average household size has declined from 7 to 4 people in last 40 years. Decline in household size as a consequence of both fertility decline and change in the family structure in Turkey show that family structure in Turkey has been changing from extended families to nuclear families. According to results of Turkey Demographic and Health Survey 2008 (TDHS 2008) the rate of nuclear families in Turkey has reached to 70 percent (Koç et.al 2010). Among these families, classical nuclear family consisted of spouses and children has the highest proportion (56%) while the proportion of nuclear families consisted of spouses is %14 and the proportion of extended families is %16 (Koç et. al 2010).

Families have been changing since several decades due to several reasons in Turkey. Structural changes such as urbanization, changing mix of agricultural and industrial employment and changes in individual characteristics such as increased levels of education particularly for women underlie the modernization process while economic development accompanies this process and these are accepted as affective in changing value systems in Turkey (Aykan and Woolf, 2000). Thornton and Kavas (2013) consider ideology of developmental idealism in the scope of family change. They added modernization programs of Turkey and their adoption to value and belief systems of developmental idealism as other causal factors on family change in Turkey.

Family has been a central element of modernization projects in Turkey since the late Ottoman Period. Legal family norms were also implemented during the early Republican period such as Civil Code which banned polygyny, increased the minimum age for marriage, enacted gender equality in inheritance and granted equal child custody rights for both parents (Thornton and Kavas 2013). Increase in women's autonomy was also one of the main concerns of the Republic of Turkey. Based on the increase in women's autonomy since early Republican period, it can be assumed that when the women's position increases in the society, it affects their relations with their elderly parents. With the increase in women's visibility in public domain, elderly care may lose its primary role even if traditional familial roles enforce caring for the elderly. It is of importance that

policy changes prepare the background for macro family changes but changes in the norms regarding the women's roles as a primary care giver also affect the parent- adult child relations.

Aytaç (1995) questioned whether modernization process of Turkey also changed the familial relations. He claims that modernization has a different face in Turkey and even if nuclear families are increasing, strong familial relations still continues in Turkey. To what extent co-residence patterns are influenced from the modernization process is controversial. Intergenerational co-residence is a vehicle for the exchange of social, emotional, practical and financial support (de Yong Gierveld et.al, 2012) and there are studies pointing out the co-residence patterns in Turkey.

The common point of these studies is that they claim that not only elderlies but also adult children prefer intergenerational co-residence or at least they prefer to live in the same neighbourhood which shows that traditional ties with children and families still continues in Turkey (Aytaç, 1995; Aykan and Wolf, 2000). TDHS 1998-2008 also shows that children living in the same neighbourhood have increased from 34 to 37 percent in 10 years time. Aykan and Wolf (2000) in their study, indicate that different factors affect the co-residence patterns of elderlies and children. They claim that when adult children have children and constitute their own nuclear family, it affects their coresidence possibility with their parents in a negative way. They also indicate that when education level of adult children increases, coresidence possibility of adult children and families also decreases. They also found that geographical residence – whether living in an urban setting or a rural setting – also has an impact on co-residence patterns as living in rural areas increases co-residence with elderly parents.

3. Types of Intergenerational Solidarity and Intergenerational Relations in Turkey

This study uses the concepts developed by Bergston and Roberts (1991). They explain six elements of intergenerational solidarity with nominal definitions and examples of empirical indicators. These are associational solidarity, effectual solidarity, consensual solidarity, functional solidarity, normative solidarity and structural solidarity. As this paper uses the two concepts among six which are consistent with the target of the paper and the available data, they will be explained here. The first concept that the paper utilizes from is the associational solidarity. According to Bergston and Roberts (1991), it is defined as “frequency and patterns of interaction in various types of activities in which family members engage” and empirical indicators of associational solidarity are listed as “frequency of intergenerational interaction” such as face-to-face, telephone or mail interaction. Types of common activities shared such as recreation and special occasions are also among empirical indicators of associational solidarity.

The second concept that this paper utilizes is the functional solidarity; which is defined as “degree of helping and exchanging of resources.” Empirical indicators of the concept mentioned by Bergston and Roberts (1991) again are “frequency of intergenerational exchanges of financial, emotional, physical or other kinds of assistance” and “ratings of reciprocity in the intergenerational exchange of resources.”

These concepts do not point out to the direction of intergenerational solidarity, but shed light upon the discussions related to direction of intergenerational solidarity. The concept of intergenerational support flow is based on the Caldwell's (1976) wealth flow concept which mainly points out that intergenerational relation determine the way of resources. In this concept, wealth is used to refer income, money, goods, service and assurance. Even if familial relations can also be conceptualized under wealth flow theory, as Kalaycıoğlu and Tılıç (2000) use, I prefer to use "support flow" while pointing out the intergenerational support between families and children. The work of Kalaycıoğlu and Tılıç (2000) shows that the expectation for support is not only related with the expectations of elderlies but also necessities of children. They claim that there are support flows both from children to parents and from parents to children of which have some similarities. Kalaycıoğlu and Tılıç (2000) have explained the intergenerational support between children and parents as "the model of collecting resources in a common pool". It indicates that each person within the family either a child or an elderly and a parent is putting her/his resource to the common pool and the resource is being used within the family which may sometimes turns a three-generation support mechanism (elderly- adult children and grandchildren) in Turkey.

Even if most of the studies in the literature in Turkey point out the preference for intergenerational support especially from the young generation's point of view, some other studies claim that it is getting more difficult to provide upward support, in other words, support for elderlies. For instance, while Tufan (2007) claims that elderly care creates a "burden" on the neck of all family members, Kalınkara (2005) also claimed that elderly care creates "emotional burden" especially for the married children and lead them not to spend time with their nuclear family. In order to come to a conclusion for elderly and adult children's preferences, there is a need to examine the related data on their preferences.

4. Data and Methods

In order to reach the main objective of the study, this paper uses the data from "Turkey Family Structure Survey" conducted in 2006 and 2011 (TAYA- 2006 and TAYA-2011) by Ministry of Family and Social Policies in Turkey. In the selection of TAYA-2006 and TAYA 2011 sample, a weighted, multi-stage, stratified cluster approach was used.

In the interviewed 12,056 households, 23,379 individuals over age 17 were identified and interviewed individually with the Individual Questionnaire. Some of the questions were directed to elderlies above 60 with the individual questionnaire. Both of the data sets include detailed information on upward support type (young to old) and downward support type (old to young). This paper is based on these data sets derived from the questions focusing on intergenerational relations.

The direction of intergenerational support was obtained from several questions. "Who is responsible for the care of children within the household" and "who is responsible for elderly care within the household" were selected to analyse the direction of intergenerational support flows as the answers of these questions can be

categorized under the functional solidarity concept that is used for this study. Among Bengtson and Robert's conceptualizations, it should be said that the analysis on "functional solidarity" is limited with the "help across generations." "Exchanging resources" was not involved to the analysis due to the limitations of the data.

In order to analyse the level of associational solidarity between generations, coresidence pattern and the question of "how often do your children visit you?" is also analysed. "Frequency of intergenerational interaction" as a definition of associational solidarity is measured through face-to-face visits in non-resident families. Under the light of these questions, intergenerational support flows are determined and changes between 2006 and 2011 are analysed both observing coresident and non-resident family patterns. While the first two questions give insights on type of intergenerational support among especially coresident families; the analysis on coresidence pattern of the elderly provides valuable information on the type of intergenerational support for elderly living with resident and non-resident family. Also, third question focus on only elderly living without family members. Following section will provide the findings of this paper.

5. Findings

Table 1 and Table 2 presents the results regarding with the analysis of "functional solidarity" in Turkish households. Table 1 provides the percentage distribution of persons who responsible for the care of children within the household as one of the indicators of downward support. We see that while about 4 percent of care of children within the household is done by elderlies in the family in 2006, it increased to about 8.5 percent in 2011. The major change between 2006 and 2011 is the contribution of grandmothers in the care of children. While the percentage of care of children done by grandfathers remains the same in 2011 with only 0.1, the percentage of care of children done by grandmothers increased from 3.7 to 8.2 in five years time which also provides an explanation how gender is one of the determinant factors in care of children.

Table 1: Percentage distribution of persons who responsible for the care of children within the household, 2006 and 2011

Responsible person	TAYA-2006	TAYA-2011
Mother	91.8	86.6
Father	0.5	0.6
Sister/Brother	0.2	0.8
<i>Grandfather</i>	<i>0.1</i>	<i>0.1</i>
<i>Grandmother</i>	<i>3.7</i>	<i>8.2</i>
Caretaker/Day-care centre	2.1	3.1
Other	1.7	0.6
Total	100.0	100.0

Table 2 provides the percentage distribution of persons who responsible for the care of elderly within the household and provides clues on the other direction of functional solidarity (upward support). We see that even if daughter’s responsibility for the elderly care within the household has increased from 12.2 to 15.0 percent in five years time and son’s responsibility has a tendency to decline, sons still have more responsibility for elderly care within the household in comparison to daughters. However, the percentage of daughter-in laws in elderly care within the household is the highest among the others, with 36.0 percent in 2006 and 33.5 percent in 2011.

The fact that higher percentage of daughter-in laws in elderly care compared with the percentage of sons in both 2006 and 2011 reveals how gender roles are determinant in elderly care within the household as the daughter-in laws have the responsibility of parents-in laws on behalf of their husbands. The share of grandchildren, other women relatives and caretakers in elderly care has an increasing tendency during 2006 and 2011.

Table 2: Percentage distribution of persons who responsible for the care of elderly within the household, 2006 and 2011

Responsible person	TAYA-2006	TAYA-2011
Spouse	25.1	20.8
<i>Daughter</i>	<i>12.2</i>	<i>15.0</i>
<i>Son</i>	<i>22.5</i>	<i>20.1</i>
Brother/Sister	1.2	1.0
<i>Daughter-in-law</i>	<i>36.0</i>	<i>33.5</i>
Son-in-Law	0.4	0.5
Grandchildren	0.7	2.5
Other women relatives	1.2	3.3
Other men relatives	0.2	1.2
Care-taker	0.3	1.1
Neighbour	0.2	0.8
Total	100.0	100.0

Table 2A and 2B show percentage distribution of persons who responsible for the care of elderly within the household by type of settlements in 2006 and 2011. Both tables indicate that daughter’s roles in rural areas have increased in five years time in contrast to son’s and daughter’s in law’s roles. Even if roles of daughters also have increased in urban areas, there is still huge difference between urban and rural in terms of responsibility of care of elderly by daughters. Besides, responsibility of sons and daughter-in-laws has decreased in both rural and urban areas in five years time. The decreasing tendency appears to be related with the substantial increase (3-fold increase) in the share of the “other” persons such as grandchildren, other women relatives and caretakers in the care of the elderly in Turkey.

Table 2A: Percentage distribution of persons who responsible for the care of elderly within the household by type of settlements, 2006

Responsible person	Urban	Rural
Spouse	25.0	25.2
<i>Daughter</i>	5.5	17.5
<i>Son</i>	23.4	21.7
Brother/Sister	1.8	0.7
<i>Daughter-in-law</i>	41.9	31.4
Son-in-Law	0.6	0.3
Grandchild	0.5	0.9
Other women relatives	0.9	1.4
Other men relatives	0.2	0.2
Care-taker	0.1	0.4
Neighbour	0.1	0.2
Total	100.0	100.0

Table 2B: Percentage distribution of persons who responsible for the care of elderly within the household by type of settlements, 2011

Responsible person	Urban	Rural
Spouse	21.6	20.2
<i>Daughter</i>	7.1	20.8
<i>Son</i>	21.8	18.8
Brother/Sister	1.6	0.6
<i>Daughter-in-law</i>	40.7	28.3
Son-in-Law	0.8	0.4
Grandchild	1.9	3.0
Other women relatives	2.7	3.8
Other men relatives	1.0	1.4
Care-taker	0.2	1.8
Neighbour	0.5	0.9
Total	100.0	100.0

Table 3 shows the percentage distribution of elderly by family type. It shows that elderlies still live in nuclear families especially consisted of only wives and husbands. However, we see that while the percentage distribution of elderlies living in nuclear families has a declining trend, the percentage distribution of elderlies in extended, especially in the patriarchal families, and dissolved families has an increasing trend in five years period.

Table 3: Percentage distribution of elderly by family type, 2006 and 2011

Family types	TAYA-2006	TAYA-2011
Nuclear	54.7	52.1
<i>Wife+Husband</i>	<i>39.4</i>	<i>43.5</i>
<i>Wife+Husband+Unmarried Children</i>	<i>15.3</i>	<i>8.6</i>
Extended	19.3	19.6
<i>Transient</i>	<i>17.2</i>	<i>12.1</i>
<i>Patriarchal</i>	<i>2.1</i>	<i>7.5</i>
Dissolved	26.0	28.4
<i>One Person</i>	<i>20.8</i>	<i>20.0</i>
<i>One Parent</i>	<i>4.0</i>	<i>3.0</i>
<i>Other</i>	<i>1.2</i>	<i>5.4</i>
Total	100.0	100.0

Percentage distribution of elderly by co-residence patterns indicates that percentage distribution of elderlies (both women and men) living with their children has decreased between the years 2006 and 2011. In parallel to this finding, elderlies living without children have increased between the same periods. It indicates that female elderlies have a higher tendency to live with their children as opposed to male elderlies.

Table 3A: Percentage distribution of elderly by co-residence pattern, 2006 and 2011

Sex of the elderly	Living with	Living without	Total
	children	children	
TAYA-2006			
Male	32.9	67.1	100.0
Female	40.3	59.7	100.0
Total	36.9	63.1	100.0
TAYA-2011			
Male	30.5	69.5	100.0
Female	35.6	64.4	100.0
Total	33.3	66.7	100.0

Table 3B and Table 3C provide information on percentage distribution of reasons for living and not living with children. Table 3B shows that the percentage of the reason “we want to support each other” has increased from 17.2 to 19.9 in five years time which is somehow a proof for willingness to involve into the

intergenerational support process. While it was the third important reason in 2006, it became a second important reason in 2011, and this again shows that importance given to the intergenerational support has increased over time in Turkey.

Among reasons for not living with children being self-sufficient enough in nuclear families without children seems as being most important reason, the percentage of which also increased from 24 to 37 in five years time. Besides, even if the proportion of elderlies who do not want to live with their children has decreased between 2006 and 2011, they constitute the second largest group in 2011.

Table 3B: Percentage distribution of reasons for living with children, 2006 and 2011

Reason	TAYA-2006			TAYA-2011		
	Male	Female	Total	Male	Female	Total
My children do not want me to be alone	11.7	23.7	18.7	5.5	9.0	7.6
Due to our traditions	19.6	12.2	15.3	13.1	10.7	11.7
I am happy to live with my children	19.2	21.1	20.3	27.7	28.1	27.9
I need their care	9.2	15.1	12.7	10.0	14.6	12.8
I have no other possibilities	10.8	8.6	9.5	9.0	7.0	7.8
I do not want to stay in the nursing home	0.8	0.0	0.3	0.3	0.2	0.3
We want to support each other	21.3	14.2	17.2	20.1	19.7	19.9
Other	7.5	5.0	6.1	14.2	10.7	12.1
Total	100.0	100.0	100.0	100.0	100.0	100.0

Table 3C: Percentage distribution of reasons for not living with children, 2006 and 2011

Reason	TAYA-2006			TAYA-2011		
	Male	Female	Total	Male	Female	Total
My children do not want to live with me	3.7	2.6	3.1	3.8	4.1	4.0
Their house is small and no place for me in their house	9.2	11.4	10.3	5.1	6.0	5.6
No one for my care in their household	2.7	2.2	2.4	0.8	2.2	1.5
Their financial possibility is not enough to take of me	7.8	7.2	7.5	3.5	3.9	3.7
I do not want to change my social environment	29.5	30.5	30.0	16.1	17.5	16.9
My daughter in low and grandsons/granddaughter do not want me	2.3	3.6	2.9	2.1	3.6	2.9
I do not want to live with them	14.1	20.8	17.5	13.6	19.8	16.9
We are self-sufficient with my wife/husband	29.3	18.8	24.0	43.0	32.0	37.1

Other	1.4	3.0	2.2	12.1	10.9	11.5
Total	100.0	100.0	100.0	100.0	100.0	100.0

In order to analyse the associational solidarity between generations, Table 4A and 4B shows percentage of distribution of visits done by children of the elderly in non-resident families¹. We see that the frequency of visits done by sons and daughters have increased in five years time. However, frequency of visits done by sons have increased more than visits of daughters in five years time. While monthly based visits have decreased, frequency of visits in a year have increased both for daughters and sons in five years time. Increase in face-to face visits especially done in once a week or more frequent confirms that associational solidarity between children and parents as a type of intergenerational support also has an increasing trend in Turkey.

Table 4A: Percentage of distribution of visits done by children of the elderly, 2006

Frequency	Daughter	Son
Once a week or more frequent	46.9	43.8
Once a month	14.7	16.3
Several times in a year	17.9	18.9
If needed	0.7	0.3
No visit more than a year	2.5	2.7
Never	1.1	1.0
Only in the weekend	10.6	11.0
Only in holidays	5.6	6.2
Total	100	100

Table 4B: Percentage of distribution of visits done by children of the elderly, 2011

Frequency	Daughter	Son
Once a week or more frequent	49.8	51.2
Once a month	5.9	6.1
Several times in a year	22.0	24.1
If needed	1.2	1.8
No visit more than a year	1.2	1.6
Never	1.5	1.4
Several times in a month	18.5	13.8

¹ Table 4A and Table 4B can not be totally comparable as the categories provided for the question “how frequent your children (daughter and son) visit you?” have some differences as shown above.

6. Discussion and Conclusion

This paper targets to find an answer to the question of “how do the direction of intergenerational support flows have changed in Turkey” as well as “across generations who is supporting whom?” The reason why the answers of these questions is important based on the fact that population is getting older and older in Turkey and even if the elderly population have been increasing since years, families’ role are also changing. Therefore, “to what extent do the change in the families affect the direction of intergenerational support” is a question that should be answered in order to understand the effect of aging and family change in Turkey.

The analyses in the paper were based on the concepts of Bengston and Roberts (1991) namely, *functional solidarity* and *associational solidarity*. While the concept of functional solidarity is used to understand the “help across generations” living together (in co-resident families), the concept of associational solidarity is used to understand the “frequency of intergenerational interaction.”

The data from TAYA (Turkey Family and Structure Survey) 2006 and 2011 provides information on functional and associational solidarity, therefore questions regarding the elderly and child care in co-resident households, co-residence patterns, and visits in non coresident families were analyzed.

The results of the study reveal that in terms of type of the intergenerational supports, both of the supports, namely ‘*functional solidarity*’ and ‘*associational solidarity*’ are observed in the families of Turkey both in 2006 and 2011.

When the findings are examined in detail, we see that downward support (from elderlies to children) in terms of providing care to younger generation within the household has increased in five years time. Even if one of the important features of labor market in Turkey is the distinctly lower labor force participation rates of women, it has been increasing since last five years and stabled around 29% in 2013. Women’s increasing role in labor market might be one of the reasons of increasing role of grandparents in child care. However, due to the limitations of TAYA 2006 and 2011, it would not be possible to come this conclusion from the data directly. There is a need to make a further investigation on the relation between increasing labor force participation of women and increasing role of grandparents in child care. In terms of downward support it is also examined that the role of grandmothers within the family in providing care to younger generation is much more important than the role of grandfather which is one of the indicators of care work is gendered.

In terms of upward care support we see that the role of sons is higher than the daughters. However, the highest care work is done by daughters-in laws which is also other indicator of how elderly care is gendered. Even if the primary care role is given to the sons according to the patriarchal norms, gendered care ideology leads the increasing role of daughters-in laws as they are doing care work on behalf of their husbands. These findings indicate that functional solidarity in terms of providing care across generations is somehow gendered but reciprocal. Care work according to the type of settlement also indicates one of the important changes in

Turkey. In Turkey internal migration from rural to urban areas have been increasing and sons living in rural areas have more tendency to migrate to urban areas. In that sense, care of elderly is mostly done by daughters who are staying in rural areas.

Coresidence patterns indicate that the percentage of elderlies living with their adult children has a declining trend. In parallel to this finding, as a reason of not living with their children, the percentage of elderlies who do not want to live with their children constitute the second largest group despite the decline in five years time. Considering the other reasons, it may be concluded that elderlies also prefer not to change their own lives for the sake of living with their children, however living with their children is something that makes them happy.

When the data related to the associational solidarity is examined, we see that adult children have tendency to visit their parents in different times and frequency of visits has increased in period examined here for both sons and daughters, however son's visits increased more than daughter's visits during this period.

All findings indicate that regarding with direction of the support, there exist reciprocal flows of intergenerational support rather than unilateral flows in Turkey and the small changes between 2006 and 2011, also indicate that reciprocal nature of intergenerational support did not change during this process.

It may be concluded that in an aging society Turkey, with the increase of an elderly population, the need for intergenerational support will increase in the following years. In that sense, there may be an increase in the searching of upward support (from children to parents) rather than downward support (from parents to children). However, the decline in co-residence with parents indicate that family change in Turkey has an effect on co-residence patterns and therefore on dynamics of intergenerational support across generations. In that sense, how intergenerational support types continue to change would remain a significant topic for Turkey as adult children's preferences on living in the same neighborhood with their parents still indicates the reflections of dichotomy between traditionality and modernity into the family and intergenerational relations.

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The Mindset of Japanese Engineers within the Field Of Care Robotics - Robotics in Aging Japan

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1. Introduction

Japan is known for being a technology-loving country – a country of robots. Since the Meiji Restoration (1868-1912), change has been linked with technology. Due to the adaption of Western technology, it was possible to progress from a feudal state to an industrialised country. Furthermore, with the help of new technology, it was possible to not only repair the damages sustained during the war, but also to achieve extensive prosperity. This trend of using technology continued in the seventies with the large scale implementation of industrial robots. For this reason, it is not surprising, that Japan is called the “*Robot Kingdom*” (Schodt 1988).

Aside from technological advancements, there are other factors, mainly cultural, that can explain the Japanese penchant for robots. An early example is *karakuri*, which are mechanic dolls from the 17th century that were used to serve tea. Shintoism and modern pop culture, including anime and manga, have lead to a very relaxed environment for the development of robotics in Japan.

The Ministry of Economy, Trade and Industry (METI) itself has declared robotics as a key industry for the future (JETRO 2006). This, however, was probably primarily motivated by the issues associated with an overageing society. Not only Japan’s society getting older, but it also experiencing the longest life expectancy and on eof the lowest birth rates in the world. No efforts have been made to compensate for the aging population and because of complex relationships with foreigners throughout Japanese history, no reforms to the strictly regulated immigration laws are expected. Furthermore, the birth rate is also not likely to increase in the near future.

Against this background, it is not surprising that robots are discussed as a technical solution for a social problem and a strong incentive for the further development of robotics. Therefore, a broad discussion about the application potential of service and entertainment robots has been taking place. This leads to a trend of new developments being considered quickly and without reserve. Robots are even being developed to interact directly with people, i.e. in nursing homes.

Even if there is a wide debate in the media, service and entertainment robots are still being developed and designed by universities, research institutes and companies. Here a particularly interesting aspect to explore is to what extent are these robots created and do certain factors, such as culture influence specific concepts.

There are only a few publications about the state of research regarding robots in Japan. The most famous is from the late eighties: Frederik Schodt's "Inside the Robot Kingdom". Schodt deals primarily with industrial robots in his publication. This is because the research field of service and entertainment robots did not exist at this time. In 2006, Timothy Hornyak the science and technology journalist, published his book "Loving the Machine", which refers to Schodt's content, but does not discuss industrial robots in detail. In contrast to Schodt, Hornyak emphasizes the latest developments in the field of entertainment robots. Both publications provide a solid overview on the state of research on Japanese robotics.

There are also a few other publications from English and German speaking countries which deal with the phenomenon of robots. Here Cosima Wagner should be mentioned, given that her focus is on the cultural aspects and use of robotic-assisted therapy (Wagner 2009a, 2009b).

Apart from the rather narrow literature selection in English and German, there are a variety of publications in Japanese, which should be introduced briefly as an overview of different approaches. Since the seventies, Masahiro Mori has been dealing with the effects of machine design on humans (Mori 1970). Hiroshi Ishiguro paid particular attention to humanoid robots and their interaction with humans (Ishiguro 2007, 2009). Takanori Shibata, the inventor of the robot seal Paro, is focusing on robot applications specialised for the elderly (Shibata 2007).

A detailed study of the mindset of Japanese engineers and researchers has not yet been conducted. The upcoming study is intended to fill this gap and shed light on Japanese robot development in detail.

2. History of Robotics

The term robot, as we use it today, goes back to the play *R.U.R.* (1920) by Karel Capek. His play was written when fascism and communism were gaining strength in Europe at the beginning of the nineteenth century. He derived the word robot from the Slavic word *robota*, which means labor or forced labor. The play is about machines that work for humans, but at some point start to revolt against their creators and eventually eradicate them (Capek 2009).

Religions with their own understanding of technology also have an impact on how robots are perceived. From a creationist religion's perspective such as Christianity, Judaism or Islam, the creation of artificial life is seen as competition with God. According to this understanding, the creation of a robot interferes with the divine order, which attracts punishment as consequence (Ichibiah 2005: 34). This could be one possible explanation for the fact that Europeans are only playing a minor role in humanoid robot development.

Literature and media were affected by Capek's robot term. In the past there have been many negative publications of robots, which in turn have influenced the present negative associations with robots. In

current literature and media, robots are usually hostile towards humans or act destructively, which conforms to the above mentioned influence of Carpeke and religion.

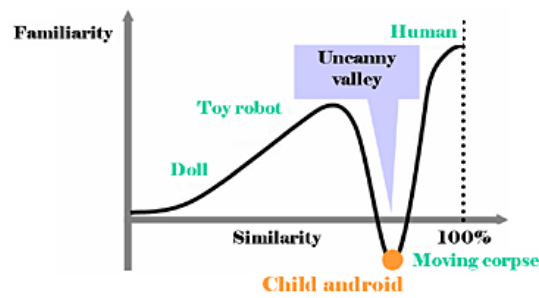
A few examples are the movies *Frankenstein* (1931) and *The Terminator* (1984). Capek's term *robot* has also been used by science fiction author Issac Asimov, but in his work they are viewed in a positive light, and had a huge influence on robotics with his robotic ethics (1938). His novels are about the issues which arise from his three laws of robotics:

1. A robot may not injure a human being or, through inaction, allow a human being to come to harm.
2. A robot must obey the orders given to it by human beings, except where such orders would conflict with the First Law.
3. A robot must protect its own existence as long as such protection does not conflict with the First or Second Laws (Ichibiah 50-51).

This sophisticated and positive understanding of robots had a strong influence on science fiction literature during the last few decades. The book *I, Robot* by Asimov (1950) was adopted into a film of the same title in 2005 (Ichibiah 80~).

Originally, robots were something we would mainly associate with science fiction literature, but since the seventies they have become part of reality. With the progress of automation and, thereby, the development of industrial robots, a great number of autonomously acting machines have found their way into production. Joseph Engelberg and George Devol are said to be the inventors of the first industrial robot, Unimate. Devol recognized early that a large amount of tasks in fabric production consisted of simple mechanical actions and that these tasks could easily be automated (Schodt 1988: 30-35). The Unimate's design resembles that of a tank with an arm on top. Even today a lot of industrial robots are created with this arm-based design.

Due to industrial robotics, extensive mass production without a compromise of quality became possible and led to considerable economic growth in industrial nations. Despite these benefits, in Europe and the U.S., there is a fear that robots are replacing humans (Sone 2009). This fear results from a negative image of robots spread through the media and a working environment in which lifetime employment has become an exception. This negative view on robots presents an obstacle for the development and implementation of service and entertainment robots.



[Figure 1: The Uncanny Valley (IRL 2013)]

Already, in the seventies, Masahiro Mori started to pay attention to the effect of the appearance of machines and also robots and its effect on their acceptance by humans. His “uncanny valley” theory (Mori 1970) is still used today as an important criterion in robot development. His theory states that the more closely a robot resembles a human in movement and form, the more likely it will be accepted; however, the acceptance does not infinitely increase. At a certain point, even if the similarity is continually increasing, the sense of familiarity will suddenly decrease and the design will be rejected by humans.

It’s for this very reason that during the development process, a machine-like design is often chosen. This is not only the result of the influence of the media or religion; but also by the fact that a lot of engineers, especially in Germany, think that functionality is more important than design (Gräfe 2010). This may be true for the industrial robots, but it is not applicable to service or entertainment robots, which are used in an environment with humans. In the field of service and entertainment robotics, acceptance is a key factor for the applicability of robots and in that context; the design determines the success of a specific robot.

Another factor may be the state of technology in the field of humanoid robots in Germany. Japan is the worldwide leader in the field of bipedalism and will not be overtaken any time soon. For this reason, Germany is avoiding direct competition through an alternative design approach. In Germany, some well known service robot projects are: Care-O-Bot, CASERO and HERMES.



[Figure 2: Care-O-Bot]



[Figure 3: CASERO]



[Figure 4: Hermes]

<http://www.unibw.de/fir/roboter/hermes> (accessed 14.11.2014)]

2-1. Robotics in Japan

In contrast to Europe and the U.S., the development of robots in Japan is more geared towards a human-like appearance. The reason for this choice lies in a different cultural environment and understanding of technology. This different way of thinking is even more apparent when talking about the implementation of robots; especially when considering issues connected with demographic change. Here, among other factors, the declining working age population and the increasing number of people needing care has led to a shortage of health care professionals and, therefore, an increased demand for quick and feasible solutions for this labor shortage - here is where the application of robots is being considered.

Since the Meiji Restoration (1868-1912) technology has been connected to change. Through the adaption of Western technology it was possible to modernize the country in a very short period of time. Furthermore, after the loss of the Second World War, Japan was totally destroyed. Technology made it possible to rebuild the country and regain its prosperity. Since the seventies the bulk of the world's industrial robots have been used in Japan (Schodt 1988: 15-16) and to this day it's still a pioneer in the field of robotics.

Aside from the modernization and industrialization of Japan, Shintoism has had a great influence on the attitude towards inanimate objects, such as machines and robots. According to Shintoism, it is assumed that even inanimate objects have a soul with specific attributes. Therefore, there is a discrepancy between the Japanese and Christian understanding of an object's existence, where Christians believe only living creatures have autonomy and God is the sole creator of life.

In this context, the *karakuri* are another reason for the Japanese enthusiasm towards robots. *Karakuri* are machines or automats that can independently perform specific movements (Wißnet 2007: 19-34). During the Edo Period (1603-1868), they were invented using the basics of foreign watch technology. The Edo Period is remembered as a time of isolationism, during which nearly all trade and

technology transfer was suspended for 200 years. The karakuri were an exception since they were allowed to be researched for entertainment uses. These mechanical dolls enjoyed great popularity at festivals and are still partly in use today.

Furthermore, robots play a special role in modern pop culture, especially in manga and anime. In Europe and the U.S., films like *The Terminator* and *Frankenstein* transmit a negative view on robots. In contrast to this, there is a positive view on robots in Japan, where robots are often portrayed as friends or seen as helping humans. Some examples of this are Astro Boy (1951-1968), Doraemon (1970-present), and Mobile Suit Gundam (1979-present).

Astro Boy is a manga written by Osamu Tezuka which depicts a story about a robot with a soul that wants to be as human as possible. The story often incorporates the positives and negatives of technology and their relation to humans, where Astro Boy stands up for the humans and gets into complex and difficult situations (Hornyak 2006: 48-53).

It is important to note that Astro Boy was released right after the war was lost and a belief in reconstruction through technology was very strong (Schodt 2007:17-33; Kenji 2010: 69~). It could be seen as an analogy of Japan catching up with the West through technology during the Meiji Restoration.

Doraemon is another anime and manga character. The manga and anime are both still in production today after over 40 years. Doraemon is a 22th century robot from the future that assists its owner in various situations. Doraemon uses various futuristic tools that he pulls from his pocket, which sometimes makes the situation even more difficult for his clumsy master. In Japan and most of Asia, Doraemon enjoys a large popularity, which is similar to the popularity of Mickey Mouse in Europe and the U.S.

Mobile Suit Gundam (often referred to as just “Gundam”) is an ongoing Japanese anime series from the late seventies which has been adapted into many forms, including manga and movies. The story is about the war between human space colonies, developed due to the overpopulation of the Earth and their rebellion against the Earth for autonomy. Action is centered on gundams, giant robots that are used as weapons (Hornyak 2006: 61-69). Gundam is particularly popular among teenagers and young men.

These anime and manga have shaped a lasting positive image towards robots in Japan. They influence both the developers and the public attitude towards robotics. Overall, it is safe to say, that through the combination of specific cultural factors like Shintoism, karakuri and pop culture, a positive environment for the acceptance and development of service and entertainment robots exists. Therefore it is no surprise that robotics are put forth as an approach to solve problems that are associated with the demographic change (Nakayama 2006, NEDO 2009).

2-2. Robotics and Demographic Change in Japan

Due to cultural and economic changes in the early seventies, the birthrate in Japan began to fall

under to a level of 2.1 children per woman (Ishii 2008). Currently the birthrate is around 1.3 children per woman and furthermore the population has declined slightly between 2005 and 2009. Forecasts state that the population will decrease by 25% by 2050. During the same period, the population over 65 years is expected to increase from the current 20% to 40% (Atoh 2008: 18-19). As a result of the demographic change in Japan, it is assumed that it has led to a labor shortage in the field of elderly care.

Japan has to work out remedial measures to counteract the declining labor force and the shortage of nursing staff. This trend of dropping population can be alleviated by different social approaches. For example, the labour shortage can be balanced with a more lax immigration policy, allowing a greater number of qualified individuals into Japan. Also, having a higher percentage of women or older people in the working world would help alleviate the labour shortage as well. In particular, hiring qualified individuals from abroad will improve the healthcare and elderly care sector. These social approaches aside, robots are also seen as a possible alternative. It appears that there is a tendency to lean towards technological solutions and less towards social reform. Japanese engineers and scientists have tried to design machines that resemble and move like humans for a long time. One known example that resembles a human is the bronze figure machine Gakutensoku that was introduced in 1928 at the World Exhibition in Kyoto by Makoto Nishimura (Hornyak 2006: 35~). Gakutensoku was able to change his facial expression and move his head and hands via air pressure, which allowed it to write words.

Industrial robots played a major role in the economic revival of Japan during the sixties. Instead of easing strict immigration policies to help with the shortage of labor, they introduced widespread automation through robotics - the very first industrial robot was put into operation during this time (Schodt 1988: 113-114). Thanks to an employment structure focusing on longterm success, there was no fear of labor replacement by robots. Instead of replacing them, workers were simply transferred to other working fields if their current field was replaced by robots.

The improvement of technology in the eighties helped the robots to become faster, more precise and more applicable, which led to their quick and broad extension. At this point 60% of the world's existing industrial robots were in operation in Japan (Schodt 1988: 15). Currently 36% of industrial robots worldwide are used in Japan, and 80,000 of the total 113,000 robot units built in 2008 were exported from Japan (Tanaka 2010). Japan is not only using robots to compensate for the decreasing labor force, but also to gain a foothold in the robotics market to acquire capital worldwide. The Japanese government is providing substantial financial support for the development and research of robots. The METI has proclaimed robotics as one of the key industries that will get economic promotion in the future (JETRO 2006).

Japanese companies and universities, however, are not concerned with economically usable robots. They have focused their attention on the development of robots that can act like humans or

interact in a natural way with humans. Many engineers often refer to inspiring examples from manga and anime, especially *Astro Boy*. For them, their development objective is to create robots that look and act like humans. A few well known examples of anthropomorphic Japanese robot projects are the communication robot, wakamaru, the astronaut like robot, ASIMO, and the musician, Toyota Partner Robot series.



[Figure 5: wakamaru]



[Figure 5: ASIMO
<http://asimo.honda.com/gallery> (accessed 14.11.2014)]



[Figure 6: Toyota Partner Robot
http://www.toyota-global.com/innovation/partner_robot/family_2.html (accessed 14.11.2014)]

2-3. The State and Future of Japanese Robotics

Worldwide, the matter of elderly care and care in general is becoming increasingly important. Notably, Japan quickly and comprehensively needs to respond to its rapidly aging society.

In the study and development of assistive robotic technology, Japan has already been doing research for many years. An example is the research of Toshimitsu Hamada and Mitsuru Naganuma, who analyse the effects and benefits of robot assisted therapy. In their experiments they use AIBO and Paro in nursing homes to examine their effect on the elderly (Hamada et al. 2006). AIBO is a dog-like robot, which is able to interact with his owner and be programmed through a remote control. Paro is a seal-like robot, which can communicate through sound and is used for therapy. On a similar basis as animal assisted therapy, it seems that by using Paro, it can help relieve stress and discomfort in the elderly (Shibata 2006). One advantage of robots in the field of health care is that there is no problem with hygiene regulations and the running costs and so, in comparison with a living therapy dog, costs are much lower.

Another Japanese robot that enjoys great media attention is the humanoid robot named RI-MAN developed by RIKEN. RI-MAN is equipped with visual, olfactory, auditory and tactile sensors (RIKEN BMC 2008). It has the ability to lift and carry people. RI-MAN is expected to be used in hospitals and nursing homes in the near future. The robot should relieve the physical burden of the

nursing staff by moving people out of bed and into wheelchairs, and vice versa. RI-MAN's successor RIBA is a collaboration between RIKEN and Tokai Rubber Industries, who together established the RIKEN-TRI Collaboration Center for Human-Interactive Robot Research. The most noticeable difference to its predecessor is that its design was not inspired by a human but by a polar bear.

In Japanese society, the idea of using robots within the field of elderly care seems to be highly fixed. From an economic perspective, the government and many companies have invested huge amounts of money into robotics research. From an everyday perspective, families are looking for ways to facilitate the care of their aging relatives. Noriko Dethelfs and Brian Martin (2006) have examined Japanese politics on technology in the context of elderly care. They looked closely at the prospects of international standard technology, robot technology and barrier-free technologies, such as wheelchair ramps or stairlifts. The result of their research revealed that after considering the advantages and disadvantages a combination of the diverse options is the best strategy in terms of aging.

It is often said that Japanese society is very robot friendly. Intercultural studies, however, indicate that the attitude towards robots in Japan might be more complex than assumed. A study by Bartneck et. al. (2005), shows that in many areas the acceptance of technology in comparison to other robot technology countries, such as China, the Netherlands and Germany, is not very different. In all measured categories Japan had an equivalent acceptance towards robots as Germany. In another study (MacDorman et al. 2009) conducted in universities in the U.S. and Japan, considerable differences regarding the attitude towards robots were found. The most outstanding was that Japanese students seemed to be much more familiar with robots than students in the U.S.

In recent decades advanced technologies, such as automation and robotics, have made a substantial contribution to the successful development of Japan; and have assisted it in becoming a prosperous and economically strong nation. Therefore, it is no surprise that politicians, companies, and researchers are seeing technology as both a means of assuring international competitiveness and also to address social issues, such as labor and nursing staff shortages. A high-tech nation with a leading position in the field of robotics is additionally an important part of Japan's self-created image.

One of the most famous humanoid robots is ASIMO, which is manufactured by Honda. ASIMO is said to be one of the world's most advanced robots ever. According to the website for ASIMO, it is the result of two decades worth of research and has undergone a huge number of changes. The latest ASIMO is 130 cm tall and weighs 54 kg. Furthermore, he can walk, ride a bike, transport things and has 36 degrees of freedom (Honda 2011). Degrees of freedom refers to the number of freely selectable independent motion capabilities of a system. Through extensive travels by ASIMO to different countries, it has become an ambassador for Honda and advanced Japanese technology in general.

The aim of many engineers and researchers is to eventually create a robot that cleans, cooks and can take care of aging parents at home (MacLeod 2009). Junichi Takeno of Meiji University takes up the position that robots will be able to deal with complex social tasks and will be able to simulate

human emotions one day (Tabuchi 2008). Hiroshi Ishiguro of Osaka University focuses primarily on the research of androids with the aim of developing robots that look confusably similar to humans (Ishiguro 2009). The main advantage of humanoid robots can be seen in the ease of usability in human-orientated environments. It is also natural for humans to deal with their own existence. In this sense, robots serve as a kind of mirror (Ishiguro 2009). Ishiguro's most famous robot is the Geminoid, which has been designed according to Ishiguro's own physical model. The Geminoid is a remote-controlled robot used to communicate and work, much like a human sized cell phone. Furthermore, the robot has body functions such as breathing and facial expressions created by a hydraulic system. This leads to the impression that it is a proper human being. One research article on the Geminoid demonstrated that the distinction between humans and Geminoid is very difficult (Bartneck et al. 2009). Other developers are seeing robots as walking computers that respond only to voice commands and can follow their users in their home environment.

Overall, there is a greatly diversified robot research landscape in Japan and regarding the direct human-robot interaction the perceptions are open-minded. The origins of this can be found in the positive cultural environment where there are few reservations towards technology and robots.

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