ALLOPARENTAL CARE IN TWO SOCIETIES: WHO HELPS AND IN WHAT CIRCUMSTANCES

A Dissertation presented to the Faculty of the Graduate School at the University of Missouri-Columbia

In Partial Fulfillment of the Requirements for the Degree of Doctor of Philosophy

by

GRETCHEncara Perry

Dr. Karthik Panchanathan, Dissertation Supervisor

MAY 2016
The undersigned, appointed by the dean of the Graduate School, have examined the dissertation entitled

ALLOPARENTAL CARE IN TWO SOCIETIES: WHO HELPS AND IN WHAT CIRCUMSTANCES

presented by Gretchen Cara Perry, a candidate for the degree of doctor of philosophy,

and hereby certify that, in their opinion, it is worthy of acceptance.

______________________________________________
Professor Karthik Panchanathan

______________________________________________
Professor David C. Geary

______________________________________________
Professor Craig Palmer

______________________________________________
Professor Mary K. Shenk
ACKNOWLEDGEMENTS

I began my academic career at a distance from anthropology. As a teenager, I knew I would attend university, but it wasn’t clear what the focus should be. Luckily for me, there were two people in my life that were doing ground-breaking work in academia who were also great friends to me and my family, Margo Wilson and Martin Daly. It was their work in psychology, working in nonhuman and human behavior that lit the way for me starting my academic career in psychology. Margo in particular was a huge influence on me, as an example of an intellectually brilliant woman who pursued academic questions relentlessly, while encouraging those around her. She was the role model that started me in the academic direction that would lead me to this Ph.D. in anthropology.

While working on my B.A. in psychology, I embarked on a 23 year career in social services, largely in child protection, but also working in serious mental health services, and developmental services in Southern Ontario. The challenges in this work were always apparent, but I had the good fortune of working with some of the most intelligent, caring, compassionate, dedicated, and clear-headed colleagues. Ingrid Bell, Paula Berry, Tom Howard, Donna King, Sue Maciazyk, Janine Mackay and LeeAnne Moses, in particular, offered so much wisdom and support over the years that I will always be in their debt. My skills as a clinician, interviewer, assessor and teacher have all benefited from my time with them. I am very lucky to call them colleagues and friends, and I hope my research is eventually helpful to them in their work.

Anyone who has done applied work, especially in social services, knows that some of the people we learn the most from are those we are there to work for. Certain
memorable “clients” have profoundly affected how I see the world and what I consider important to pursue, and have expanded my understanding of suffering, survival, and the value of people. They have taught me how to work harder, the importance of really knowing the nuances of my job so I can put them in a position to succeed, and how to think critically about organizational systems that undermine their ability to get ahead and have access to the opportunities that are rightfully theirs. They instilled in me a determination of purpose that pushes me to question, learn, and fight for what I believe is right. Cheryl, “Fast Eddie”, Joanne, John, and Mrs. S. were often in my mind as I developed research questions, read research papers, engaged in interviews, and wrote articles. Would this work have met their needs? Would it have been useful to them when I was working with them? Cheryl's brilliant mind, street-fighting attitude, harsh criticisms, and relentless demands were not for the faint of heart, but put me through an intense annealing process that made me a better child protection worker and probably a better (if not stronger) person too. There are some who may have sighed with relief when she died too young, but I will always owe her a debt of gratitude.

Embarking on a Ph.D. in anthropology as a middle-aged woman who is deep into an established career was a leap of faith, particularly because my work and academic backgrounds lay elsewhere. It has been an intense process that I would not have been able to get through without the support of my committee: David Geary, Craig Palmer, Karthik Panchanathan, and Mary Shenk. I am grateful to David Geary for being so supportive of me from the beginning of my time at Mizzou through to the end. Being able to attend his journal group was a wonderful opportunity to evaluate evolution-minded research across psychological and anthropological perspectives. His prompt,
clear, and insightful comments were always helpful and enabled me to move forward in a focused and energized way. His collegiality and humor helped me see the bigger picture when frustrations blurred my next steps.

I thank Craig Palmer for being extremely encouraging and supportive of me. His willingness to join my committee and provide a new perspective on anthropological views of the family was so very helpful. When I met with Craig, I always knew we would discuss issues that I hadn’t considered and initially might have thought tangential. Over time, our conversations would ring in my ears at just the right time and I would have “aha!” moments that would not have been possible without him and were essential to this dissertation. His confidence in my ability and work came when I needed it the most, and gave me the boost I needed to forge forward.

Karthik Panchanathan deserves special mention and thanks. He has been the Advisor I needed and has been able to bring out the best in my work. He has been supportive while persistently questioning my grasp of ideas and methods that I needed to understand. For instance, his ability to make statistics that were initially dancing in the ether of my understanding clear and even obvious was a relief and has been greatly appreciated. Karthik is a great teacher who raises the game of students in his classes, pushing us all to be novice research professionals, rather than just students taking courses and getting degrees. He created opportunities for students and faculty to learn together in collaborative meetings that were essential preparation for giving talks, developing funding projects, and creating a collegial environment where we all learned what each other was working on, thereby extending our learning far beyond the classroom alone.
His commitment to higher learning and to independent and critical-minded thinking has raised the bar for what I expect of myself and the work I do.

I thank Mary Shenk for all her help as well. It is only her order in the alphabet that has put her at the end of my thanks to my committee. Mary’s interest in me early in my time at Mizzou, her suggestion that I do a project in Matlab, Bangladesh, and her sponsorship of my application for a National Science Foundation Research Experience for Graduate Students award have been the foundations for a substantial portion of this dissertation. Her invitation to attend the meetings she had with her students provided important support and learning for me. Mary’s feedback on my research, her insights about Bangladesh, and South Asia generally, have contributed substantially to whatever validity my analyses and interpretations may have.

I owe a huge thank you to Katie Starkweather, who has been an amazing friend and support throughout my time at Mizzou and in the field in Matlab, Bangladesh. I can’t imagine what those early days in Dhaka would have been like without you, but it wouldn’t have been pretty! Our time together in Matlab is where some of my fondest memories of Bangladesh are. Eating at the canteen with our respective research teams, having dinners discussing the events of our day, the latest research, and what methodologies would be the best as our projects changed and morphed in the pilot phase, were all so much fun.

I thank Shane Macfarlan who attended a practice talk of mine during my first year at Mizzou. He suggested some new statistics for analyzing my data, which resulted in an additional article from my child protection database. This article (which is chapter 2 of
this dissertation) and my understanding of statistics benefitted greatly from this collaboration and his interest in my work.

I also thank Joanna Balija, Kasha Kot, Jennifer Kotler and Ron Martens for help with the child protection database. We were able to input the necessary data and meet timelines with Family and Children’s Services that would have been impossible without their help.

I should also thank not just the N.S.F. (U.S.A.) for their funding of my research award (N.S.F. #1338748), but also the G.E. Huggins Fellowship that was the scholarship that enabled me to do my Ph.D. at the University of Missouri, and the Ministry of Children and Youth Services (Ontario), for their funding of my research project in Waterloo Region, Canada.

My research in Bangladesh depended immensely on two wonderful Research Assistants, Ummehani Akter (“Honey”) and Md. Saddiquzzman (“Kanchan”). Honey was more than a Research Assistant; she was my guide through the maze of never ending baris in Matlab and my ambassador for many of my interviews. Her hard work, professionalism, commitment, experience, patience and generosity were seemingly endless and mediated by her kindness to me and the families she worked with. Kanchan was a Research Assistant with never ending motivation. His dogged determination to get another interview done was unrivalled. I’ve never before had to tell someone to work less and go home!

I also thank the staff at the International Centre for Diarrhoeal Disease Research, Bangladesh, especially Kim Streatfield, Nurul Alam, and Taslim Ali. Without their
support of my project, the necessary permissions would have been impossible to attain and opportunities to gather all the information I needed would have been lost. Taslim Ali was especially helpful in successfully navigating the various trials and tribulations inherent in doing work in rural Bangladesh. His counsel and collegiality were the calm on some stormy days and made my life there enjoyable, even if he thinks I eat like a child. I certainly have the experience of a child when eating with only my right hand, so perhaps it was a compliment.

Deep thanks need to be extended to my family, who despite their worries about me leaving an established career, heading to Bangladesh, and launching myself into the sometimes cut-throat world of academia, has remained supportive and genuinely interested in my research. Their thoughtful questions about my work, willingness to listen to me talk about the struggles and strife of doing a Ph.D., and commitment to ensuring I remain connected to the outside world have provided me with the love, support and perspective I needed in those more frustrating times.

Finally, the person who requires the biggest thanks is Martin Daly, my partner in life and research. Without his love and belief in me, I would not have taken the leap of faith that launched me into this Ph.D. It was his counsel that pointed me in the direction of anthropology and I still think he was right that it is the place to learn what I need to for my life beyond this Ph.D. He has been my most stalwart supporter, my firm ground when life seemed like a tumbling stone, and the best, most patient copy-editor I could ever hope for. His experience, depth of knowledge of many areas of literature, keen analytical mind, sense of perspective, and fearlessness has been a huge resource and inspiration to me. From the beginning of our friendship years ago, he set an example of
what could be learned through the scientific process and how research could be relevant both theoretically and to applied settings. His success at research that builds up a coherent, defensible body of work that might even contribute both to knowledge and to the lives of real people has given me hope that I can start along that path too.
TABLE OF CONTENTS

ACKNOWLEDGEMENTS ...........................................................................................................ii

Chapter

1. INTRODUCTION .............................................................................................................1

2. MATERNAL FOSTER FAMILIES PROVIDE MORE STABLE PLACEMENTS THAN PATERNAL FAMILIES ..........................................................15

3. ALLOPARENTAL CARE AND ASSISTANCE IN A NORMATIVELY PATRILOCAL SOCIETY ......................................................................................... 31

4. GOING HOME: HOW MOTHERS MAINTAIN NATAL FAMILY TIES IN A PATRILOCAL SOCIETY ...................................................................................... 53

5. WHO INVESTS IN CHILDREN IN NON-INTACT FAMILIES IN RURAL BANGLADESH? ........................................................................................................ 73

6. CONCLUSION ................................................................................................................ 106

REFERENCES .....................................................................................................................118

VITA ......................................................................................................................................131
Chapter 2

Figure 1. Frequency of placements with maternal versus paternal grandparents, in relation to the grandparent's current partnership status and the relationship of the grandparent's partner to the placed child. .................................................. 21

Figure 2. Survival of placements with maternal versus paternal kin, until termination for any reason. ................................................................. 22

Figure 3. Survival of placements with maternal versus paternal kin, until placement breakdown with child moving to another placement. ........................................... 23

Table 1. Descriptive statistics associated with the Cox proportional hazards multivariate regression analysis examining placement breakdown. .................... 24

Chapter 3

Table 2. What variables predict the "breakdown" of kin placements (i.e. placement termination with a move to another placement) in Waterloo County, 2008-2010? Results of a Cox proportional hazards multivariate regression analysis of placement "survival" to breakdown. .................................................. 25

Table 1. Household attributes and primary alloprenatal helpers of the 86 interviewed mothers, in relation to family type and bari residence. ....................... 39

Table 2. Mean child height and weight, and mean education, by family type and bari residence. ......................................................................................... 43
Table 3. Multiple regression models predicting children's height relative to WHO norms for the child's age and sex. ................................................................. 44

Table 4. Multiple regression models predicting children's weight relative to WHO norms for the child's age and sex. ................................................................. 45

Table 5. Multiple regression models predicting children's educational attainment relative to the norm for the child's age. ................................................................. 46

Chapter 4

Table 1. Numbers of respondents in each family type and the status (whether living and, if so, where) of their mothers and mothers-in-law. ........................................ 59

Figure 1. Percentages of the respondents’ mothers versus mothers-in-law who were visited at various frequencies, among those known to be alive and not residing in the same bari as the respondent. ................................................................. 60

Table 2. Results of an ordinal logistic regression ("ologit") analysis of the predictors of women’s frequency of visiting their children’s grandmothers, given that the latter were known to be alive and were not residing in the same bari as the respondent. .......................................................................................... 61

Table 3. Results of an ologit analysis of the predictors of women’s frequency of visiting their own mothers, given that the latter were known to be alive and were not residing in the same bari as the respondent. ................................................................. 62
Table 4. Results of an ologit analysis of the predictors of neolocally residing women’s frequency of visiting their mothers and mothers-in-laws, given that the latter were known to be alive and were not residing in the same bari as the respondent. ..... 62

Figure 2. Proportions of the respondents’ mothers and mothers-in-laws who were visited at various frequencies. ................................................................. 63

Table 5. Numbers of respondents in each family type with living brothers or brothers-in-law. ............................................................................................................. 64

Figure 3. Percentages of the respondents’ most frequently visited eligible brothers versus brothers-in-law who were visited at various frequencies. ............... 65

Table 6. Results of an ologit analysis of the predictors of women's frequency of visiting their children's most frequently visited maternal and most frequently visited paternal uncles. ................................................................. 66

Table 7. Results of an ologit analysis of the predictors of women's frequency of visiting their brothers and brothers-in-law (their children’s maternal and paternal uncles) who did not reside in the same bari as either their own mother or the respondent. ................................................................. 67

Figure 4. Proportions of the respondents’ brothers and brothers-in-laws who were visited at various frequencies. ................................................................. 68

Chapter 5

Table 1. The frequencies at which different relatives served as a child's primary caregiver, by family type. ................................................................. 83
Table 2. Frequency of nomination as a child's secondary caregiver, by laterality of family and family type. .......................................................... 85

Table 3. Bari residence of children by family type. ................................................. 86

Table 4. Frequency of nomination as a child's primary material resource provider (other than household members), by laterality of family and family type. .......... 87

Table 5. Frequency distribution of the number of primary caregivers that a child had experienced, by non-intact family type. ......................................................... 90

Table 6. Mean child height and weight, expressed as WHO-normed standard scores, by family type. .................................................................................................. 91

Table 7. Participation in education among children of school age (seven years and older), by family type. .......................................................... 91

Table 8. Multiple regression models predicting child height, weight and educational attainment on the basis of age, sex, and household attributes. ...................... 92

Table 9. Maintenance of contact with maternal and paternal relatives in non-intact families. Table entries are numbers of children. .............................................. 94
CHAPTER 1 – INTRODUCTION

This dissertation is focused on alloparental care (investment in children by individuals who are not their parents), and specifically on the differential investment of maternal and paternal kin, the degree of relatedness between alloparent and child, and the associated outcomes for children. The dissertation is organized around four research articles that are published in or submitted to peer-reviewed scientific journals. The introduction reviews the theoretical foundations of the research and the resultant articles. The conclusion interprets the cumulative importance of the body of work for furthering the understanding of alloparental care and its potential applied relevance.

THEORETICAL PERSPECTIVE: EVOLUTIONARY THEORIES

Human beings are born highly dependent, are slow to mature, and have a long dependent juvenile period after weaning. There are relatively short inter-birth intervals between siblings (compared to our closest primate relatives; Ross & MacLarnon, 2000), commonly resulting in a mother having multiple dependent children under her care. This requires a high degree of investment of time, energy, and resources that are rarely available from a mother alone (Hrdy, 2009), hence the need for and involvement of fathers and/or alloparental caregivers (caregivers other than parents). An evolutionary perspective can then help us generate hypotheses about who is likely to come forward to invest time and resources in children.
KIN SELECTION AND HAMILTON’S RULE:

Why would anyone be so altruistic as to invest in another person’s child? Hamilton (1963, 1964 a, b) provided one answer. He explained, through mathematical modeling and animal examples in the natural world, his idea that an expanded "inclusive" conception of fitness, including not just personal reproduction but an individual’s impact on the reproductive success of others who share her genes, could explain the evolution of altruism: selection favors helping conspecifics whenever the direct fitness cost to the helper is less than the direct fitness benefit to the recipient of the help times their degree of relatedness \((c < rb)\). In addition to demonstrating how altruistic inclinations towards someone other than offspring could evolve, the theory suggests conditions under which behavior such as alloparental care should be more or less likely to evolve and to be facultatively expressed.

How is alloparental care targeted? Hamilton's theory suggests that it will be more likely to occur and more substantial the closer the genetic relationship between the child and the alloparent. A parent's relationship to a child is 0.5 (or higher if the parents are themselves relatives) and so is the relationship between full siblings. On this basis alone, fathers and older siblings are presumptive candidates to help mothers raise young children. Grandparents, aunts, uncles and half-siblings constitute the next tier of close relatives at \(r = 0.25\).

Hrdy (2009) has argued that human beings are cooperative breeders which she defines as “...any species with alloparental assistance in both the care and provisioning of young” (pg.30). Cooperative breeding has been found in a broad range of animal taxa including insects, fish, birds, and mammals (Konner, 2010; Kramer, 2010), and this
cooperation almost always involves close kin and only rarely non-relatives (Clutton-Brock, 2009; Lukas & Clutton-Brock, 2012). Based on inclusive fitness theory, it would be expected that in a species such as human beings where there is a high need for alloparental support, close relatives will provide it.

Grandmothers are especially likely to play the role of alloparents because women's fertility is typically declining or completed by the time they have grandchildren in whom they might invest, and the cost that alloparenting imposes on personal reproduction is therefore low. In this regard, several theorists have argued that natural selection has acted on women's physiology and psychology to make grandmothers into alloparenting specialists (Euler & Weitzel, 1996; Hawkes et al., 1989; Kramer, 2010). To what extent grandmaternal investment can explain the human female life history and especially the evolution of menopause is controversial (Hawkes & Coxworth, 2013; Hill & Hurtado, 1991), but regardless of the merits of the various arguments on this point, grandmothers are likely to play a major alloparental role for the reasons noted above.

PATERNITY UNCERTAINTY

This dissertation focuses on alloparents, and does not highlight the involvement of fathers (who are parents, not alloparents). Nevertheless, I will briefly review ideas about paternity uncertainty and its effects, because this body of theory and research provides one foundation for understanding potential differences between matrilateral and patrilateral alloparenting. Fathers are as related to their offspring as mothers, and derive the same fitness benefits from them, but male animals, especially mammals, do not invest in their young as consistently as mothers (Trivers, 1972). In addition to sex differences
in the relative utility of mating effort versus parenting effort (Low, 1978), another possible reason for this asymmetry is that mothers can be certain of their parentage, whereas fathers cannot. This "paternity uncertainty" may select for male adaptations that improve discriminative paternal resourcing of dependent putative offspring (Geary, 2000).

The term "paternity uncertainty" is sometimes used to refer to a parameter, namely the incidence of extra-pair paternity in a population, and sometimes to a mental state of individual men who have presumably evolved to assess cues of non-paternity. Arguably, all else equal, putative fathers are less likely to invest in children they are less confident they actually fathered, and these concerns extend to other family members with respect to their decisions about alloparental care and investment. Both the population parameter construal of paternity uncertainty and the issue of case-specific doubt or skepticism may be relevant here. There is abundant evidence that men and their relatives pay attention to cues of non-paternity (Daly & Wilson, 1988a), but more generally, if paternity uncertainty was a significant pressure over human evolution, adaptations that support wariness of investing in men’s children may have evolved, resulting in tendencies toward preferential investment in the children of one's daughters and sisters over those of one's sons and brothers, and hence in a bias toward alloparental care that is primarily matrilateral (from the perspective of the child) rather than patrilateral.

By this reasoning, it is not only the degree of relatedness between child and potential alloparent plus the latter's personal reproductive potential that may affect alloparental inclinations, but also family laterality. For example, all grandparents are related to a focal child by 0.25. The maternal grandmother's relationship to the child,
however, is through two certain maternal links, whereas the paternal grandfather’s is through two uncertain paternal links; for both the maternal grandfather and the paternal grandmother, one link is certain and one not. These considerations have led many researchers to propose that maternal grandmothers should be the most solicitous grandparents and paternal grandfathers the least, with the other two intermediate and perhaps equal (Euler & Weitzel, 1996 pg. 3). Aunts, uncles, cousins and other less closely related family would have their own degrees of separation and risk of non-relatedness from the focal child, but they are also at varying degrees of relatedness to the child. The less related the relative to a focal child and the greater the risk of non-relatedness due to paternity uncertainty, the less likely that relative may be to provide alloparental care.

Theorizing about who should come forward is only helpful if it provides guidance in understanding actual behavior. Indeed, the propositions that alloparental care will be provided mainly by close relatives and also disproportionately by matrilateral relatives have been strongly supported by studies in modern nations such as Germany, Japan, Canada, England, and the United States, as well as in smaller scale societies in Dominica, the Trobriand Islands, Oceania, Argentina, Ethiopia, the Gambia, Malawi and elsewhere (Bove et al., 2002; Chrastil et al., 2006; Coall & Hertwig, 2010; Euler & Weitzel, 1996; Flinn & Leone, 2006; Fox et al., 2010; Gaulin et al., 1997; Silk, 1980; Voland & Beise, 2002). And yet despite this multi-cultural support for a matrilateral bias in alloparenting, whether it is universal is still debated (Pashos et al., 2016). Other social and cultural factors such as inheritance rules, patrilineality and patrilocality would be expected to have an impact on opportunities for alloparenting and perhaps also on inclinations.
THE IMPORTANCE OF SOCIOECOLOGY

The way extended families organize themselves and function varies across ecologies. My research therefore explores these alloparental care questions in a developed and a developing nation, and across two differently structured societies. The work reported here is not “cross-cultural” in the sense of trying to obtain a representative sample of all cultures or aspects of alloparental caregiving and to then conduct analyses that would speak to a weighted understanding of culture in aspects of alloparental care. I am, however, interested in acknowledging the broad differences between societies and considering the similarities and differences that may indicate what influences different patterns in alloparental caregiving. This requires consideration of at least two features of societies: (1) co-residence patterns, which would provide information on who is available to provide alloparental care, and (2) social norms about alloparental caregiving. This second societal feature relates to who would come forward, out of those available, to provide alloparental care. For instance, parents who are divorced and those who are married may have the same potential alloparental caregivers, but who is willing to invest in a child of divorced parents may be quite different from their married counterparts, if divorce is shameful in the particular society or conflict between the families exists. Indeed, depending on their relationship circumstances, women might adjust whom they associate with to gain access to alloparental support (Scelza, 2011). The particular questions that I examine in the four empirical chapters to follow are these:

(1) Does degree of relatedness affect who provides alloparental care or invest in children?
(2) Does family laterality account for who comes forward to provide alloparental care or invest in children?

(3) Are more difficult family circumstances associated with different alloparental caregivers providing childcare and investing in children?

(4) Do child outcomes (placement stability, child development, and education) vary based on who provides alloparental care or invests in children?

(5) Do residential patterns (which impose differential availability of potential alloparental caregivers or investors in children) affect alloparental caregiving and investment?

(6) What aspects of alloparental caregiving and investment vary and which are consistent across research sites?

(7) Do mothers make efforts to maintain contact with particular alloparental supports, and if so who are they?

FIELD SITES FOR THIS DISSERTATION RESEARCH

I had access to two field sites with separate samples for my research. The first was Waterloo Region, Canada, where my research population consisted of children in the care of Family and Children’s Services of the Waterloo Region (FACS Waterloo; a child protection agency) from January 1, 2008 through December 31, 2010. Data from the complete archives of case records of these children and their families were made available to me, from which I created a streamlined database which focused on the variables required for this research. At this site in the developed West, neolocal postmarital residence is typical.
The second field site was Matlab, Bangladesh, where I had access to a sample of 500 families in this rural Upazila (or subdistrict), through collaboration with the International Centre for Diarrhoeal Disease Research, Bangladesh (icddr,b; a public health NGO). I obtained my data from this latter site through open-ended and structured interviews, as well as from the icddr,b census books. A major reason for choosing Matlab as a field site was that it has been described as patrilocal: normatively (and reportedly in reality as well) women typically reside in their husband’s family’s bari, or joint family compound, after marriage (Harris, 2001). Bangladeshis furthermore engage in purdah, the seclusion of women, which restricts women’s movements outside of the family bari (Harris, 2001) and hence their access to their natal families.

These sites enabled me to investigate alloparental caregiving patterns across environments with variable access to potential alloparental caregivers and investors in children. By investigating these sites, I hope to add to the literature about what aspects of alloparental caregiving reflect cultural features of a particular sample and what others are more consistent with potential human universals in alloparental caregiving and support.

I will briefly review the four research articles that are the body of this dissertation, focusing on their associated research questions. The methodology and results of the research articles will not be repeated in the introduction, as they are fully explained within the articles themselves. I will conclude by reviewing how the articles address the questions set out in this introduction and consider how my findings inform a deeper understanding of alloparenting and how investigations into alloparental care can be utilized in applied settings.
FACS WATERLOO DATA

ARTICLE 1, CHAPTER 2

My collaborators and I created the first dataset at my previous workplace (FACS Waterloo). I had a deep familiarity with the context in which these data had been originally collected and had direct involvement with about 20% of these families. The data include information on all children entering out-of-home placements over a 3-year period, their placement type (stranger foster care, group home, or kin placement), and duration of the placement, among other variables. Importantly, the kin placement category was further delineated by type of "kin" home (genetic, affinal or nominal) and by degree of relatedness and whether the relatedness was through the child’s mother or father. The data collection, creation of the database, analyses, and writing of peer reviewed articles (of which there are three) began in 2010 and continued through 2014.

The third article based on the FACS Waterloo data is chapter two of this dissertation and has benefited significantly from the improved understandings of social evolution and statistics that I have been gained during my Ph.D. studies. Chapter 2, “Maternal foster families provide more stable placements than paternal family”, begins by reviewing current academic literature on alloparental care and fosterage and adoption. Analyses focus on the degree of relatedness and laterality of caregiver in frequency of placement and the quality of that placement. The hypotheses are (1) that maternal family will provide care more frequently and those placements will be more stable than with paternal families, (2) that more closely related family will provide more frequent placements, and (3) that maternal families and more closely related kin will endure
greater hardship to provide placements than paternal kin or more distantly related kin. The data were analyzed using simple tests of relative frequencies and a Cox proportional hazard model that addressed the determinants of placement stability. All three hypotheses were supported. This article (Perry, Daly & Macfarlan, 2014), which has been published in *Children and Youth Services Review*, brings social work literature together with perspectives from evolutionary anthropology, biology and psychology.

**BANGLADESH DATA**

Chapters 3 through 5 are based on a field study in Matlab, Bangladesh that involved the creation of three sets of data. The information that I collected distinguished five family types: two-parent families and single-parent families where parent absence was due to death of the mother or the father, divorce or estrangement, or migrant labor. The first data set includes a dozen transcribed open-ended interviews with respondents across the family types, providing rich ethnographic detail; the second is a series of 190 structured interviews with primary caregivers of dependent children across the five family types; the third is a stratified random sample of 500 families (100 in each of the same 5 family types), which tracks the co-residence patterns of the family members between 2000 and 2012. Sampling of the five groups does not correspond to their relatives frequencies in Matlab, but provides sufficient numbers to enable comparisons among the family types.

ARTICLE 2, CHAPTER 3
The second article in this dissertation is “Alloparental care and assistance in a normatively patrilocal society”. Ethnographic reports describe Bangladesh as culturally patrilocal. Most prior research, largely in non-patrilocal environments, has found that mother’s relatives are more frequent (and sometimes more beneficial) alloparental caregivers than father’s kin. Would this be the case in Matlab as well? Normative family types were the focus in this paper’s analyses: only the interview data from intact families (that is, two-parent families where both parents resided in the family home, and migrant labor families where the father was away working), in which the child’s mother was the primary caregiver and was in her first marriage, were included. I analyzed data on residence patterns, and on whom mothers named as their most common alloparental caregiver (the child’s secondary caregiver) and as the main person outside the household who provided material resources for a child. Simple frequency comparisons addressed the relative alloparental participation of different categories of kin and highlighted a level of matrilateral kin involvement that was surprisingly high, given the patrilocal cultural norms.

Multivariate analyses explored the potential influences on child outcomes (height, weight, and education) of family income, child age, child sex, *bari* residence (patrilocal, matrilocal or neolocal), and the identities of alloparents. The substantial involvement of mothers’ relatives in these children's lives would not be anticipated on the basis of many summary statements in the ethnographic literature, and a focus of my discussion is why this might be so. Possible influences include the recent demographic transition and an ongoing shift from historical land ownership and agricultural work to new economic patterns associated with migrant labor and remittances, but the ethnographic record could
reflect cultural ideology more than actual practice, and it is not presently possible to say whether the patterns of alloparental involvement that I describe are long-standing or new. This article has been accepted by *Current Anthropology*, and is scheduled to be published in December 2016.

**ARTICLE 3, CHAPTER 4**

A growing area of research concerns visiting patterns between parents and extended family members. In part, visits have been treated as an assay of available alloparental caregiving and material investment, as well as of mother’s efforts to gain access to these supports (Pollet et al., 2013; Silverstein et al., 2002). In the modern West, it has typically been found that mothers maintain more frequent visiting with their natal families (their children’s matrilateral family) than with the children's paternal relatives, despite matrilateral relatives tending to be farther away, on average. In Chapter 4, “Going home: How mothers maintain natal family ties in a patrilocal society”, I asked the following question. Do women maintain strong relationships with their natal families even in a setting where postmarital residence norms and practice are predominantly patrilocal and women participate in *purdah*? In other words, I wanted to know whether the pattern found in the West held up in patrilocal Bangladesh.

I analyzed the visiting frequencies of mothers to their children’s extended families, with a focus on familial laterality and on contacts with the children's grandmothers and uncles (who were found, in Chapter 3, to be the principal alloparental caregivers and material investors, respectively). To ensure that the relationship of the person that their mother visited would have the same family laterality for her dependent
child, the sample was confined to interviewed mothers, and did not include the (relatively infrequent) interviews in which a child's primary caregiver was someone other than the mother, thus excluding the Deceased Mothers group and those children in the other four family types who were cared for by respondents other than their mothers. The visiting patterns of mothers in intact (Two-Parent and Migrant Labor) and non-intact (Widow and Divorce) family types were explicitly compared in the analyses. Multivariate analyses (ordinal logistic regressions) addressed the determinants of visiting, including whether the marriage of a focal child's parents was still intact, the respondent’s age, post marital residence, family income, and proximity, among other things. Almost all mothers in all groups visited their natal families, but traveling outside the bari to visit the child's patrilateral relatives was far less prevalent.

This article has been submitted for publication, where it is currently under review for inclusion in a special issue on the topic of "Parenting Strategies in Modern and Emerging Economies".

ARTICLE 4, CHAPTER 5

The final research article for this dissertation focuses on the non-intact family types (Widow, Mother Deceased and Divorced) and where appropriate, compares them to the intact family types (Two-Parent and Migrant Labor). The primary variables analyzed included bari residence (to target the availability of alloparental caregivers), who was reported as the primary alloparental caregivers (secondary caregiver) and primary material investors, and child outcomes (height, weight, education, number of deceased siblings, and number of primary caregivers after parental death or divorce). Analyses
also addressed laterality of the primary alloparental caregiver. Univariate comparisons, multivariate regressions, and ethnographic description were all part of the analyses. I also considered whether who was providing care fitted with the social norm of Matlab as a place where marriage is normatively virilocal, and discussed what might be influencing or associated with adhering to or diverging from these social norms, such as potential effects of shamefulness of family circumstance, inheritance patterns, and family income. Patterns in alloparental care, material investment and child outcomes in non-intact families were discussed in comparison to the intact family types, as well as the matrilateral trends found in other research. Ethnographic examples of the typical experience of each non-intact family type were described within the socioecology of Matlab.

This chapter has been submitted for publication.
CHAPTER 2

MATERNAL FOSTER FAMILIES PROVIDE MORE STABLE PLACEMENTS THAN PATERNAL FAMILIES

ABSTRACT

The use of kinship families to provide foster care has been increasing due to changes in legislation and the hope it will provide better quality placements, but there has been little consideration of differential outcomes based on sub-types of kin. Using data from one Ontario, Canada, child protection agency we compared the frequency and stability of placements with maternal versus paternal kin. We found that maternal relatives provided placements much more often than paternal kin and this was most striking with single grandmothers. 90% of genetically related kinship caregivers were grandparents or other equally close kin. Maternal and paternal kin placements had similar durations, but maternal placements ended significantly more frequently by the child returning home or obtaining a permanent placement, whereas paternal placements more often broke down. A Cox proportional hazards analysis, controlling for child sex, age, reason for placement and caregiver attributes, showed that paternal kin placements were more than twice as likely to break down as maternal kin placements, within a given interval. We discuss whether placement stability should be considered a proxy for placement quality and policy implications, and we comment on aspects of assessing prospective placements.
INTRODUCTION

In most of the Western world, it is now standard child protection practice to place children who have been removed from their parents' care with kin. In many jurisdictions, preferential placement with kin rather than unrelated foster parents is now mandated by law (Gleeson & Craig, 1994). This constitutes a radical change. Until about 50 years ago, kin were explicitly shunned as potential foster carers, and the transition to preferential kinship care is still ongoing (Daly & Perry, 2011; Ingram, 1996). In Ontario, Canada, where the study reported here was conducted, child protection agencies have been obliged by law to prioritize kin placements since 2006.

Two main justifications are typically offered in support of the shift to kin care (Ehrle & Geen, 2002): that kin are likely to be more committed to the children in their care, on average, than strangers, and that family disruption may be less traumatic when the new caregivers are already known and trusted. Reduced funding for child welfare agencies has also played a role in the rise of kinship care, however. Kin families often receive less financial and other support than traditional stranger foster families, despite having lower incomes, less education, more health challenges, and more dependents in the home (Berrick & Barth, 1994; Cuddeback, 2004; Dubowitz et al., 1993; Ehrle & Geen, 2002; Grant, 2000; Gleeson et al., 1997). Whether increasing reliance on kinship care has had a net positive impact on child well-being remains to be determined (Daly & Perry, 2011; del Valle & Bravo, 2013; Font, 2014; Ryan et al., 2010; Winokur et al., 2009).

Kin caregivers are a heterogeneous group (Berrick & Barth, 1994; Hayslip & Kaminski, 2005; Terling-Watt, 2001), but the distinctions among them have received little
attention in studies that document the rise of kinship care and compare its attributes and impacts to those of stranger foster care (Zinn, 2010; but see Perry, Daly & Kotler, 2012; Sallnäs et al., 2004). According to dictionaries and common usage, one's “kin” are one's relatives by genealogical descent, marriage, or adoption. In child welfare law, however, the term "kin" has been expanded to encompass additional people such as family friends or unrelated persons of the same minority ethnic group (Farmer & Moyers, 2008; Geen, 2003). In the relevant Ontario legislation, for example, placement with a “neighbor or other member of the child’s community” qualifies as a "kin" placement (Ontario Child Welfare Secretariat, 2006). We will refer to caregivers with a genealogical, marital or adoptive link to the child as "related kin", and other unrelated caregivers who qualify as kin under the legislation as "nominal kin". Whether the usual justifications for favoring kin placements apply to nominal kin, who are not necessarily even acquainted with the child, is questionable, and we have reported that placements with nominal kin are significantly less stable (long-lasting) than those with related kin in Waterloo, Ontario (Perry et al., 2012). Here, we address a further distinction within the category of genealogical kin, namely that between relatives through a child's mother versus father.

There is a large anthropological and psychological literature concerning the involvement of relatives other than the parents in child care. Cross-culturally, the most common providers of short-term child care are close kin, especially grandmothers, aunts, and older siblings (Hrdy, 2009; Kramer, 2010; Silk, 1990). Moreover, despite a heavy emphasis on patrilineal kinship in many human societies, most research indicates that maternal kin, especially maternal grandmothers, are more involved than their counterparts on the paternal side, and that their involvement is more beneficial to the
children (Coall & Hertwig, 2010, 2011; Danielsbacka et al., 2011; Euler, 2011; Fox et al., 2010; Gaulin et al., 1997; Hawkes & Coxworth, 2013; Huber & Breedlove, 2007; Pollett et al., 2009; Sear & Mace, 2008; Strassmann & Garrard, 2011; Tanskanen & Danielsbacka, 2012). It seems that both women and men turn mainly to their maternal relatives when resources are scarce, when men are unreliable providers, when marital relationships are unstable, and when paternity may be in question (Daly & Wilson, 1988b; Stack, 1974). Because relationship conflicts are often an aspect of why families become involved with child protection services, and because doubts about paternity are probably more prevalent than in the population at large, we anticipate that maternal family would substantially outnumber paternal family as kinship caregivers.

If maternal relatives tend to be more willing kin caregivers, on average, than paternal relatives, one might also anticipate that placements with maternal kin would be more stable, but as far as we are aware, the literature contains no explicit comparisons of placement stability in maternal versus paternal kin homes. Placement stability is the sole outcome measure in the analyses presented here. Placement stability is widely considered an indicator of placement quality because it is associated with better outcomes for children (Carpenter & Clyman, 2004; Jones Harden, 2004; North American Council on Adoptable Children, 2005; Rock et al., 2013). Considerable research shows that repeated moves while in the care of a child protection agency are associated with elevated rates of physical and mental health diagnoses, homelessness after leaving care, involvement with the criminal justice system, and use of illicit drugs (Barth & Jonson-Reid, 2000; Dworsky et al., 2013; Jonson-Reid & Barth, 2000; Paxman, 2006; Rubin et al., 2004, 2007). We recognize, however, that placement stability is an imperfect
indicator of placement quality, and that the fact that placements with kin are usually relatively stable (Chamberlain et al., 2006; Perry et al., 2012; Winokur et al. 2008, 2009; but see Herring et al., 2009; Oosterman et al., 2007) does not imply that they are necessarily in the best interests of the child.

THE DATA BASE

The data analyzed in this paper consist of all primary child protection placements under the auspices of Family & Child Services (FACS) of Waterloo, Ontario, regardless of duration, in which children were placed between January 1, 2008 and December 31, 2010 with caretakers who were their genealogical kin (i.e. putative genetic relatives) on the maternal or paternal side. The stability (persistence) of these placements was tracked through December 31, 2010. “Primary” placement refers to the fact that temporary “respite” placements are excluded.

The data analyzed here represent 313 primary placements with genealogical kin, involving 289 children who experienced at least one such placement. We treat the individual placement as the unit of analysis. This is a subset of the 389 “kin” placements analyzed by Perry, Daly & Kotler (2012); excluded from the present analyses are 45 placements with nominal kin; 23 placements with relatives by marriage or adoption; 5 placements with caregivers who were older full siblings of the placed child and thus could not be categorized as either maternal or paternal kin; and 3 cases in which files were unavailable for legal reasons. Readers are referred to Perry et al. (2012) for additional details about kin caregiving in Ontario and the larger database from which these cases are drawn.
We collected the following information from agency files: the child’s age and sex; the primary kin caregiver’s age, sex, and specific relationship to the child; whether there was a secondary caregiver and if so, the same demographic data as for the primary caregiver; how the placement ended (broadly, return home vs placement breakdown vs placement intact at end of study). We also recorded several economic, health status and criminal involvement variables (see Perry & Daly, 2013), but because these could not be coded for many cases they are not analyzed here.

MATERNAL AND CLOSER KIN PREDOMINATE

The 313 primary kin placements consisted of 202 with maternal kin and 111 with paternal kin. Maternal kin placements included 142 with the child's grandparents, 30 with an aunt or uncle, 4 with a maternal half-sibling, and 26 with more distant relatives. Paternal kin placements included 70 with the child's grandparents, 37 with an aunt or uncle, and 4 with more distant relatives. Because of the small numbers of placements with genealogical kin other than grandparents, we did not compare placement stability across these specific types of relatives, but we address whether placement with grandparents versus all other relatives is a predictor of stability in section 4.

The circumstances of maternal grandparents who provided care differed from those of their counterparts on the paternal side. Figure 1 shows that the numbers of caregiving pairs of grandparents on the two sides scarcely differ, but that the maternal side predominates among caregiving couples in which only one was a genealogical relative of the focal child, and that the predominance of the maternal side is even more extreme when it comes to lone grandparents providing care without partner assistance.
Grandparents who provided care without the help of a partner consisted of 52 maternal grandmothers, 8 maternal grandfathers, 9 paternal grandmothers, and no paternal grandfathers.

Chapter 2, Figure 1. Frequency of placements with maternal versus paternal grandparents, in relation to the grandparent's current partnership status and the relationship of the grandparent's partner to the placed child.

**PLACEMENTS WITH MATERNAL KIN ARE MORE STABLE**

Figure 2 shows that maternal and paternal kin placements persisted for similar durations through the first year post-placement. Placements that were intact at the end of the study period, but had durations of less than a year, are “time censored” by being included in Figure 2 (and in Figure 3) only up to the study end date.

This apparent equivalence of stability is misleading, however, because it masks a distinction between placements that "broke down" such that the child was then placed elsewhere under the auspices of the agency, and those that ended for the "good" reason that the child left protective care and returned home. Of the 41 paternal placements that
Chapter 2, Figure 2. Survival of placements with maternal versus paternal kin, until termination for any reason (placement broke down and child moved to another placement; child returned to parents; child aged out of care).

came to an end within 360 days, 66% broke down, compared to just 30% of 79 maternal placements that came to an end ($\chi^2_{1, df} = 13.9, p < .001$). This pattern holds true for all types of grandparent-headed families. Considering only placements that ended within the study period, 25% of those with both maternal grandparents broke down and 75% returned home, whereas 71% of those with both paternal grandparents broke down and 29% returned home; 36% of placements with a maternal grandparent and a stepgrandparent broke down and 64% returned home, whereas 100% of placements with a paternal grandparent and a stepgrandparent broke down; and 33% of placements with a lone maternal grandparent broke down and 67% returned home, whereas 100% of placements with a lone paternal grandparent broke down.
Chapter 2, Figure 3. Survival of placements with maternal versus paternal kin, until placement breakdown with child moving to another placement.

Figure 3 shows that maternal placements persisted much better than paternal placements if only breakdowns (n = 61) are treated as placement termination while cases in which the child returned to parental care (or in one case aged out of care) are treated as time-censored cases that were still intact until monitoring ended. To assess the significance of the stability advantage of maternal placements, as well as whether that advantage might be due to any of various confounding variables rather than to the maternal - paternal distinction itself, we conducted a Cox proportional hazards multivariate regression analysis (Rabe-Hesketh & Skrondal, 2008) of "survival" to breakdown, incorporating the potential predictor variables listed in Table 1.

The maternal-paternal distinction and child age were the only statistically significant predictors of placement stability in this multivariate analysis (Cox
<table>
<thead>
<tr>
<th>Variable</th>
<th>Yes</th>
<th>No</th>
<th>% yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Placement breakdown</td>
<td>61</td>
<td>252</td>
<td>19.5</td>
</tr>
<tr>
<td>Physical or sexual abuse recorded</td>
<td>19</td>
<td>294</td>
<td>6.1</td>
</tr>
<tr>
<td>Caregiver is child’s grandparent</td>
<td>212</td>
<td>101</td>
<td>67.7</td>
</tr>
<tr>
<td>Caregiver has partner</td>
<td>213</td>
<td>100</td>
<td>68.1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Female</th>
<th>Male</th>
<th>% female</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Maternal</th>
<th>Paternal</th>
<th>% maternal</th>
</tr>
</thead>
<tbody>
<tr>
<td>202</td>
<td>111</td>
<td>64.5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean (SD)</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Child age at placement (years)</td>
<td>5.3 (4.7)</td>
<td>0</td>
<td>15</td>
</tr>
<tr>
<td>Placement duration (days)</td>
<td>340 (303)</td>
<td>1</td>
<td>1093</td>
</tr>
</tbody>
</table>

Chapter 2, Table 1. Descriptive statistics associated with the Cox proportional hazards multivariate regression analysis examining placement breakdown.

proportional hazard model statistics: Log Pseudo-Likelihood=-313.7; Wald $\chi^2$=18.3; p=.006; n=313; Table 2). Their respective hazard ratios indicate that (1) placements with paternal kin were more than twice as likely to break down, per unit time, as those with maternal kin, and (2) the risk of breakdown per unit time increased by 8% (i.e. by a factor of 1.08) for each additional year of age at placement, when the other potential predictors in Table 1 were statistically controlled. The primary caregiver having a partner and explicit notation of physical or sexual abuse in the child protection file were both associated with slight increases in stability, while a male (as opposed to female) child and being placed with a grandparent (as opposed to some other relative) were both associated with slight decreases in stability, but none of these slight associations approached statistical significance.
Chapter 2, Table 2. What variables predict the "breakdown" of kin placements (i.e. placement termination with a move to another placement) in Waterloo County, 2008-2010? Results of a Cox proportional hazards multivariate regression analysis of placement "survival" to breakdown.

<table>
<thead>
<tr>
<th>Predictor variable</th>
<th>Hazard ratio (RSE)</th>
<th>z</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paternal kinship link to child</td>
<td>2.06 (0.6)</td>
<td>2.6</td>
<td>.009</td>
</tr>
<tr>
<td>Age at placement</td>
<td>1.08 (0.03)</td>
<td>2.8</td>
<td>.005</td>
</tr>
<tr>
<td>Male child</td>
<td>1.37 (0.4)</td>
<td>1.2</td>
<td>.23</td>
</tr>
<tr>
<td>Physical or sexual abuse victim</td>
<td>0.65 (0.4)</td>
<td>-0.7</td>
<td>.46</td>
</tr>
<tr>
<td>Primary caregiver has a partner</td>
<td>0.88 (0.3)</td>
<td>-0.4</td>
<td>.67</td>
</tr>
<tr>
<td>Primary caregiver is a grandparent</td>
<td>1.05 (0.3)</td>
<td>0.2</td>
<td>.86</td>
</tr>
</tbody>
</table>

DISCUSSION

In this study, maternal family provided more placements than paternal family, and placements with paternal relatives were more susceptible to breakdown. These findings are consistent with a large body of multi-disciplinary and cross-cultural literature indicating that matri- versus patrilineage is an important predictor of caregiving and its sequelae, both in small-scale societies and in modern nation states (Coall & Hertwig, 2010; Euler, 2011; Pollet et al., 2007; Sear & Mace, 2008; Smith, 1988; Strassmann & Garrard, 2011). We are not aware of any previous research that specifically compares child protection placement stability in the homes of the child's maternal versus paternal kin, although the importance of pursuing this question has been noted (Herring, 2008; Perry & Daly 2013; Testa, 2013). Our interest in the possible impact of parental lineage on kinship care derives from findings in fields beyond social work. Developments in the full range of the human sciences are of potential relevance to those seeking to design and implement practices that are evidence-based and of cross-cultural applicability. By understanding fosterage and adoption practices in human history and in the full range of
human societies, we may gain insights that can help us find committed and effective placements for vulnerable children in the dominant culture of the modern West, as well as dealing in a more culturally sensitive way with immigrant and minority populations.

The stability advantage of maternal placements was significant when the other variables in Table 1 (child's age and sex, whether the child was known to have been physically or sexually abused, caregiver partnership status, and grandparental versus other kin placement) were statistically controlled. Socioeconomic and health status were not treated as additional control variables in our analyses because they could not be coded for all cases, but it is unlikely that the stability advantage of maternal placements is an artifact of confounding with these variables. The available evidence indicates that rather than being advantaged in these domains, maternal family placements were actually disadvantaged relative to those with paternal family. For those cases that could be coded, Perry & Daly (2013) found that maternal kin caregivers had higher rates of poverty, unemployment, and severe health challenges than their paternal kin counterparts, and less education. We tentatively interpreted these contrasts as indicative of a greater willingness of maternal kin to step forward under the most difficult circumstances.

The striking prevalence of maternal grandparents providing care without the help of a partner (Figure 1) can be interpreted similarly. Without a second adult to participate in caregiving and/or to provide other resources, child care is likely to be especially taxing for lone grandparents (Zinn, 2010), and Figure 1 suggests that this most demanding of circumstances deters potential paternal caregivers more than it does their maternal counterparts. The fact that the maternal-paternal contrast in Figure 1 is intermediate in the case of a grandparent and stepgrandparent is also consistent with this interpretation.
This group is expected to be one in which the demands of being a sole caretaker are alleviated, but the partners are less enthusiastic helpers, on average, than genetic grandparents (Coall et al., 2014), and if this is so, greater maternal than paternal kin motivation to provide care in difficult circumstances would predict the observed pattern.

Relatives "of the second degree" (relatedness = 0.25), namely grandparents, aunts, uncles, and maternal half siblings, provided 90% of the placements in this study, and over 70% of "kin" placements within the broader category that includes marital, adoptive, and nominal kin. We expect that such a preponderance of close kin is typical. In a representative sample from Illinois, Zinn (2010) found that grandparents, aunts and uncles provided over 80% of all "kinship" placements, including those with non-relatives. This preponderance of close kin may seem unremarkable because it is so familiar, but it becomes noteworthy when we consider that more distant relatives are much more numerous and that grandparents, simply by virtue of their age, are disproportionately likely to be infirm or deceased. We interpret their numerical prevalence as a reflection of "nepotistic sentiments", whereby people tend to provide the most support to the closest kin (Daly & Perry, 2011). Relatives of the first degree (r = 0.5), namely parents, ordinarily provide the lion's share of direct child care, and full siblings (also r = 0.5) are also important caregivers (Kramer, 2010). The rarity of siblings as primary kin caregivers in this study (in which there were 5 placements with full siblings, and 4 with half siblings) and in child protection more generally, is presumably a result of their youth, their limited numbers, and the competing demands of their own young children.

Understanding the needs of relevant subgroups of kin caregivers may help tailor the supports required to promote placement quality and stability. This requires continued
investigation into just what the relevant subgroups of kin caregivers are. Our findings highlight two potentially useful categorizations, based on family lineage and on degree of relatedness. Even if it proves to be widely the case that maternal kin, especially grandmothers, are exceptionally willing to provide care and that their commitment translates into exceptional placement stability, the quality of those kin placements will still require scrutiny. Stability is only one component of placement quality. Perry & Daly (2013) noted cases in which grandparents providing stable placements suffered from such extreme conditions as severe arthritis that impaired basic mobility and manual skills, Alzheimer's disease, depression that had recently required hospitalization, and poorly managed bipolar disorder. That such extreme challenges were found almost solely among grandparents in our sample of kin caregivers presumably reflects grandparental commitment, and indicates that grandparents who provide child care may need exceptional supports, sometimes exceeding what they request. The very fact that some kin caregivers are undeterred by severe challenges requires that we ask whether these placements have the resources available to provide for the complex needs of the children and their caregivers (Berrick & Barth, 1994; Kelley et al., 2011; Hayslip & Kaminski, 2005; Ryan et al., 2010; Testa, 2013).

The fact that placements can end for bad reasons ("breakdown") or for good ones (return to parents, or other permanency outcomes) is another reason to beware of an excessive emphasis on placement stability. We found that placements with paternal relatives were more likely to break down than those with maternal kin, whereas the latter were more likely to end for desirable reasons, and that ignoring this distinction makes maternal and paternal placements appear to be equally stable. We are not suggesting that
paternal kin placements should be avoided, but lineage is apparently one important correlate of commitment, and it may be especially important to consider what further supports are needed when children are placed with paternal kin. Both paternal families and nominal kin have sometimes been seen as an underutilized resource for child placements (e.g., North American Council on Adoptable Children, 2005), but we cannot just assume that more such placements will alleviate the shortage of suitable foster homes without further consideration of why such families come forward less frequently than maternal kin, and why they presently provide less stable placements.

Not all kin placements, whether stable or not, yield positive outcomes, and recent evidence suggests that children placed with kin may even fare less well in certain domains than those in traditional non-kin foster placements. Ryan et al. (2010) report that kin placements can be associated with elevated rates of juvenile delinquency. Kelley et al. (2011) found that a highly stressed grandparental caregiver is predictive of child behavior problems. Font (2014) found that kin placements predict poorer reading scores and mixed results on “children’s math and cognitive skills test scores and behavioral problems”. We think it likely that these cases in which kinship care appears to be yielding worse outcomes are explained by the fact that kin caregivers are poorer than unrelated foster parents and otherwise disadvantaged, and by the further irony that they nevertheless tend to receive less support from the agencies charged with child well-being (Cuddeback, 2004; Ehrle & Geen, 2002). Berrick and Barth (1994) cautioned that the use of kin who have disadvantaged home environments and receive fewer resources than stranger foster families is setting up a two-tiered system of care for children who cannot live with their parents. Twenty years later, this issue remains a concern.
The present study is based on data from one child protection agency, which works within local policies, legislation and support structures; whether similar results will be found elsewhere remains to be seen. Moreover, since the period covered by this research, the agency that provided the data, FACS Waterloo, Ontario, has changed its practices. We are reporting on placements made when generalist Intake and Family Service Workers engaged with families to locate, assess and support kinship caregiving families, all within their own protection-focused caseloads. In 2011, a dedicated kinship team was established to help workers locate kin families, assess those families, and provide specialist support to approved kinship caregivers. These changes in practice may have led to changes in both the distributions of who provides care and in the differential placement stability that we have reported here and earlier (Perry et al., 2012). That said, we think it likely that differences between maternal and paternal kin in willingness to provide kinship care and in the stability of the care that they provide will prove to be widespread.
CHAPTER 3

ALLOPARENTAL CARE AND ASSISTANCE IN A NORMATIVELY PATRILOCAL SOCIETY

ABSTRACT

Parental care is often supplemented by “alloparents”. There is increasing research interest in who these alloparents are and how they affect child well-being. Most prior research indicates that mother’s kin are more frequent and more beneficial alloparents than father’s kin, but is this true even under patrilocality? This study investigated living arrangements and the alloparental care and assistance provided to mothers in intact first marriages in rural Bangladesh. Despite patrilocal norms, scarcely more than half the families actually resided patrilocally; many dwelt neolocally, and if the father was an absent migrant laborer, 22% dwelt matrilocally. Mother’s relatives outnumbered their patrilateral counterparts as primary resource contributors by 58 to 10, and maternal uncles outnumbered paternal uncles by 28 to 9. Multivariate analyses found that patrilocal residence, net of income effects, was associated with children having shorter stature and lower weight than if they reside neolocally. Matrilocal residence was associated with better child educational attainment, net of income, as was having the maternal grandmother serving as primary alloparental caregiver. Maternal relatives are far more involved in alloparental investment than might be expected on the basis of stated norms or even actual residence patterns, and their participation is apparently beneficial.
INTRODUCTION

Human parents depend heavily on others to help raise their children (Hrdy, 2009; Kramer, 2010). But this requires these alloparents to incur costs in time, energy and resources. From an evolutionary perspective, alloparenting is altruistic, and can proliferate if the average cost to the altruist, divided by the relatedness to the recipient, is less than the latter’s benefit. Altruists thus increase their “inclusive fitness” by investing in the survival of genetic relatives (Hamilton, 1963, 1964 a & b).

This logic suggests that the closer a relative, the greater the costs she should be willing to incur. The most frequent alloparental caregivers are indeed grandmothers, older siblings, and aunts, but which of these caregivers predominates and whether their support results in demonstrable benefits for the child vary cross-culturally (Coall & Hertwig, 2011; Gaulin et al. 1997; Scelza & Bliege-Bird, 2008; Sear & Mace, 2008; Voland & Beise, 2002). One potentially relevant issue is paternity uncertainty. A woman knows who her children are, but men may not. Paternity uncertainty during human evolution may have led fathers and their kin to be less willing to invest in children than corresponding maternal relatives (Alexander, 1974; Gaulin & Schlegel 1980; Hrdy, 2009). Research on differential participation by maternal versus paternal kin has focused mainly on the modern West where there is bilateral extended family structure, and matrilateral kin generally invest more (Coall & Hertwig, 2011; Euler & Weitzel, 1996; Gaulin et al., 1997; Perry et al., 2013; Pollet et al., 2009). However, there are many places where patrilocal residence after marriage is culturally normative (Murdock & Wilson, 1972), perhaps constraining matrilateral kin support.
Alloparenting can also include material and financial investments from persons other than the parents, which provide children with food, clothes, education and medical care, and can enhance their survival prospects and success as adults. This is the case in rural Bangladesh (Chen et al., 1981), where, if a husband is unable to meet his wife’s and children’s needs, his family, typically his eldest brother, is said to be the person responsible for supporting them (Kabeer, 1997).

This research was conducted in Matlab, Bangladesh, where residents have been reported to exhibit strongly patrilocal norms and practices (Bhuiya et al., 2005; Cain et al., 1979; Fraser Schoen, 2014). Matlab residents are about 90% Muslim and 10% Hindu. All speak Bangla. Agriculture and fishing are the main sources of subsistence, but residents increasingly rely on cash income earned by men working as day laborers in Matlab or as migrant laborers elsewhere (icddr,b, 2015; Rahman, 2010; Rao, 2012).

The joint family system is the social norm: an extended family consisting of parents, their adult sons, and the sons’ wives and children live in a compound (the bari) and work the family’s rice paddies and other agricultural plots together. Most baris consist of one to a few small houses, but some are much larger. Nuclear families within the compound may have their own households or share a house with another family, but married brothers rarely share a household (Amin, 1998). Other relatives may also be present in the bari, including the unmarried adult sons and daughters of the senior couple, uncles and cousins. The joint family is not just a residential configuration, but also an economic unit (Cain et al., 1979; Holman & O’Connor, 2003).

A bride moves from her natal bari to her husband’s, and is expected to observe purdah: the seclusion of women (Feldman & McCarthy, 1983; Fraser Schoen, 2014;
Holman & O’Connor, 2003). Purdah has been evolving in Matlab over the past 40 years, but it remains the norm that women usually stay within the family bari (Harris, 2001; Fraser Schoen, 2014). These cultural patterns constrain women’s and young children’s access to social partners.

Researchers in Matlab and other parts of rural Bangladesh have frequently implied that matrilineal ties are severed at marriage. For example:

“The custom of patrilocal marriage removes a newly married woman from her family of birth and places her in her husband's locality. Preference for lineage and village exogamy attenuates a woman's ties with her family of birth and reduces the possibility that her family will intervene on her behalf after marriage” (Cain et al. 1979: 406).

More recent accounts say much the same (e.g. Bhuiya et al. 2005, pp. 82; Rao 2012, pp. 32).

Other evidence, however, hints that matrilineal ties persist. For example, a warm relationship between a child and his mother's brother is allegedly typical (e.g. Kenner et al., 2008), and Gardner & Ahmed (2006) report that kinship links with mother’s family may be just as important as links with the father’s family in determining the flow of remittances from abroad. Indra and Buchignani (1997) state that a mother may seek support from her own relatives if the husband's family is very poor. The current study was designed to discover to what extent maternal kin provide alloparental care and assistance to intact families in this patrilocal society, and to assess effects of matrilateral and patrilateral kin support, especially by grandmothers and uncles, on child outcomes.
METHODS

Matlab was chosen as the field site because of its patrilocal and patrilineal social structure, quality census data, and 50-year history of research with the local population.

To mitigate the limitations of any single methodology, a mixed-methods approach was used, involving structured interviews, open-ended interviews, and anthropometric measures.

The International Centre for Diarrhoeal Disease Research, Bangladesh (icddr,b) has been collecting information on every household in Matlab (population about 230,000) since 1964, recording each birth, death, in-migration, out-migration, marriage, and divorce, at frequent intervals (currently every two months; icddr,b 2015). The resultant database permits analysts to draw random samples of various types from across the jurisdiction. Data reported here are confined to intact families with dependent children. This is the normative, most respectable family type, and the predominant setting for child-rearing (Bhuiya et al., 2005; Rahman, 1997); data on the care and alloparental assistance available to children with divorced and deceased parents will be presented elsewhere.

I distinguish between two types of normative families: those in which both parents were present in the home ("2-parent families") and those in which the husband was a migrant laborer outside Matlab and thus absent. Random samples of 100 families of each type were drawn from the icddr,b database. Inclusion criteria were that the mother was at least 19 years old, in an intact first marriage, with one or more children under the age of 13 years. Available mothers from these random samples were then approached for interview.
Twelve open-ended interviews were initially conducted with the help of a local Research Assistant/Translator. These interviews elicited respondents’ experiences, expectations, and conceptions of the local norms concerning childcare and alloparental assistance, thus contributing to the development of the structured interview.

Eighty-six mothers (40 in 2-parent families, 46 migrant labor families), who had a total of 162 dependent children, then participated in structured interviews, consisting of standardized questions and requiring about an hour to complete. These were as many interviews as could be completed within the timeframe of the study. Questions elicited basic demographic information, family socioeconomic status, co-bari and co-household residence, who served as child care providers, resource provisioning, and education level of the parents and children. For the analyses presented here, crucial questions were the following:

*Whose bari is this? (i.e. that in which the mother and children resided)*

*Who provides care for your children? Who is the most common caregiver?*

*Are there people who give your family ... [gifts, payments for school, clothing, payment for medical expenses...]? Follow up questions detailed the resources provided, who provided them, and the recipients.*

A series of questions elicited the interviewee’s estimates (in Bangladeshi Taka per month) of household income from labor outside the home, remittances, and the sale of agricultural products, which were summed and multiplied by twelve to arrive at an estimate of annual household income. Seasonally variable income was recorded as an
annual amount. To deal with the variability in household size, *adjusted household income* was then computed as the estimated household income divided by the square root of the number of household residents since household costs do not increase linearly with family size and this is an accepted method for adjusting household income (e.g., Johnson et al., 2005). *Bari* residence was categorized as "paternal" if the *bari* belonged to the husband's relatives, "maternal" if it belonged to the wife's, and "neolocal" if it belonged to kin of neither, or had been newly established by the couple themselves.

Finally, data were collected on child outcomes. The height and weight of each dependent child available at the time of interview were measured using a tape measure and scale (as per Judge et al., 2012; Reghupathy et al., 2012). Height and weight data were then converted to age-and-sex-specific standard scores, according to World Health Organization norms (WHO 2015); thus, for example, a child whose weight was 1.2 standard deviations below the age-and-sex-specific WHO norm was assigned a weight score of -1.2. A final outcome measure, applicable only to children 6 years of age or older, was Educational Attainment. Each child's number of years of schooling was recorded, and Educational Attainment was computed as the difference between the actual grade level and that which should be normative for a child of that age.

**RESULTS**

**RESIDENCE PATTERNS AND ALLOPARENTAL CHILDCARE**

Table 1 presents the distribution of *bari* residence in the 2-Parent and Migrant Labor groups. Although all families were intact, with young children, and the mothers themselves were still fairly young (mean age ± SD = 31.8 ± 6.8 years), only about half
dwelt patrilocally (53% of the 2-Parent families and 54% of the Migrant Labor families). Ten of the Migrant Labor families (22%), but none of the 2-Parent families, resided matrilocally, and a substantial minority of both groups dwelt neolocally.

Table 1 also shows how often grandmothers resided in the household with the respondent, and were thus very accessible as potential caregivers. Thirty respondents dwelt with their mothers-in-law (the children's paternal grandmothers) in the home, and an additional 12 with the mother-in-law in the same bari but not the same household. Ten interviewees had their own mothers (the children's maternal grandmothers) in the household, and no others dwelt elsewhere within the bari. All ten maternal grandmothers who resided in the same bari as the mother were named as primary contributors of direct alloparental care, but the same was true for only 30 of the 42 paternal grandmothers who resided in the same bari ($p = .092$, 2-tailed Fisher Exact Test).

Alloparental childcare is not necessarily available to those who need it most. Thirteen of 32 respondents whose family income was less than 100K BTK per annum reported that no one other than their own children or daughters-in-law helped with direct child care. Only 1 of 29 middle income mothers (100-200K BTK per annum), and 3 of 24 higher income mothers (>200K BTK per annum) reported the same lack of support ($\chi^2_{2df} = 14.3; p < .001$).
<table>
<thead>
<tr>
<th>Family Type</th>
<th>2-Parent</th>
<th>Migrant Labor</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bari Residence</td>
<td>Paternal</td>
<td>Maternal</td>
<td>Neolocal</td>
</tr>
<tr>
<td>N of respondents</td>
<td>21</td>
<td>0</td>
<td>19</td>
</tr>
<tr>
<td>N of dependent children</td>
<td>40</td>
<td>0</td>
<td>36</td>
</tr>
<tr>
<td>Grandmother in Home</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paternal grandma</td>
<td>12</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td>Maternal grandma</td>
<td>0</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Neither grandmo</td>
<td>9</td>
<td>-</td>
<td>16</td>
</tr>
<tr>
<td>Secondary Caregiver</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paternal relative</td>
<td>12</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td>Paternal relative</td>
<td>12</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td>Maternal relative</td>
<td>2</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td>Maternal relative</td>
<td>1</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td>Nuclear/bilineal relative</td>
<td>5</td>
<td>-</td>
<td>8</td>
</tr>
<tr>
<td>Non-relative</td>
<td>1</td>
<td>-</td>
<td>6</td>
</tr>
<tr>
<td>No-one</td>
<td>1</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Unknown</td>
<td>0</td>
<td>-</td>
<td>0</td>
</tr>
<tr>
<td>Primary Material Resource Helper</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paternal relative</td>
<td>1</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td>Paternal uncle</td>
<td>1</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td>Maternal relative</td>
<td>16</td>
<td>-</td>
<td>11</td>
</tr>
<tr>
<td>Maternal relative</td>
<td>8</td>
<td>-</td>
<td>7</td>
</tr>
<tr>
<td>Pat/mat family tie</td>
<td>1</td>
<td>-</td>
<td>0</td>
</tr>
<tr>
<td>Nuclear/bilineal relative</td>
<td>0</td>
<td>-</td>
<td>0</td>
</tr>
<tr>
<td>No-one</td>
<td>3</td>
<td>-</td>
<td>4</td>
</tr>
<tr>
<td>Unknown</td>
<td>0</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td>Parents’ Education</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mother’s Education</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 100,000 BTK</td>
<td>9</td>
<td>-</td>
<td>9</td>
</tr>
<tr>
<td>100-200,000 BTK</td>
<td>8</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>&gt;200,000 BTK</td>
<td>3</td>
<td>-</td>
<td>9</td>
</tr>
<tr>
<td>Unknown</td>
<td>1</td>
<td>-</td>
<td>0</td>
</tr>
<tr>
<td>Mean Adjusted Annual Household Income</td>
<td>60,900</td>
<td>79,100</td>
<td>79,600</td>
</tr>
</tbody>
</table>

Notes -
- Nuclear/bilineal relatives include parents, their children, and their children’s spouses.
- Non-relatives include landlords’ wives and unrelated neighbors.
- Mean (± SD) education in years.
- BTK = Bangladeshi Taka. (At the time of the research, 77 BTK = $1 U.S.)
- Adjusted household income = income / (N of persons in household)^2.

Chapter 3, Table 1. Household attributes and primary alloparental helpers of the 86 interviewed mothers, in relation to family type and bari residence.
Table 1 summarizes how the primary donors of material assistance, other than members of the mother's household, were related to the children they helped. The most frequent nominees were mother’s brothers (N = 28), comprising 38% of named primary resource providers; only 9 were father’s brothers. The greater role of maternal uncles than of paternal uncles cannot be attributed to a scarcity of the latter; at least 77 of the 86 interviewees had living brothers-in-law. Neither can the difference be explained by paternal uncles being excluded because they co-resided in the same household; in fact, there were only six cases in which an adult paternal uncle co-resided with the child and mother and four in which a maternal uncle did so. It is also not due to the older age of father’s brothers. Father’s brothers were, on average, 10 years older than mother’s brothers, putting them in the age range of those men at the top of their earning power and more likely to be the head of a bari where they would have most control over the income generated in a joint family. The father’s brothers were not so elderly that they were likely to be infirm or too old to provide support. Strikingly, a further 30 interviewees named a maternal relative other than the child's uncle as the primary material resource provider, whereas only one named a paternal relative other than an uncle.

The predominant role of maternal relatives as resource providers was observed across the range of income levels. For the lowest income families (<100K BTK per annum; N = 32), 75% of primary material resource providers were maternal kin, and 31% were specifically maternal uncles. For families making between 100 and 200K BTK per annum (N = 29), the corresponding percentages were 79% and 31% respectively, and for those earning over 200K BTK per annum (N = 24), they were 63% and 25% respectively.
The lowest income respondents were also the most likely to report (5 of 32) that “No one” outside the household provided any material support, compared to 1 of 29 middle income and 2 of 24 high income respondents.

PARENT’S EDUCATION

Table 1 also includes parental education level. The fathers in 2-Parent families had $7.7 \pm 4.7$ (mean ± S.D.) years of education and the mothers $6.7 \pm 3.7$. In Migrant Labor families, the corresponding levels of education were $8.7 \pm 4.1$ and $8.7 \pm 3.1$. Mother’s education was significantly higher in the Migrant Labor families ($p < .01$ by t-test), but father’s education was not. The education levels of marriage partners were highly correlated ($r = .782$ in 2-Parent families; $r = .755$ in Migrant Labor families).

For both mothers and fathers, the apparent differences in education across bari residence types were not statistically significant.

FAMILY INCOME

Finally, Table 1 includes information on household income by family type and bari residence. Families residing patrilocally tended to have the lowest incomes, and those residing matrilocally the highest, but the range was high within all family types and residence categories, and there were no significant group differences (by one way analysis of variance), regardless of whether total or adjusted incomes were compared and regardless of whether the data were log-transformed to reduce skew.

Interestingly, income was significantly correlated with education within the 2-Parent families ($r = .434$ for father’s education, $p < .01$), but not within the Migrant Labor
families ($r = -.014$). Thus, it appears that better paying employment requires education for those who stay in Bangladesh, but not for those who leave the country to be migrant laborers.

CHILD OUTCOMES

In general, children in Matlab are nutritionally challenged and small for their ages. Almost every measured height or weight fell short of WHO norms for the child's age and sex. On average, the children in this sample were almost 1.3 standard deviations below WHO norms for child height (according to WHO definitions of what constitutes a shortfall of one, two, or more standard deviations), and more than a standard deviation below WHO norms for child weight. These shortfalls in both height and weight were correlated with family income, with children from poorer families being shortest ($r = .366, p = .0002$,) and most underweight ($r = .286, p = .005$). Girls were slightly more disadvantaged than boys, but not significantly so.

Table 2 presents the average extent to which children's height and weight fell below WHO norms. Children in 2-Parent families and in paternal baris were shorter for their ages and more underweight than children of Migrant Laborers and those living matrilocally or neolocally. Because these differences parallel differences in family income, it is important to assess whether family type and bari residence predict height and weight net of income effects (below).

Table 2 also summarizes average educational attainment. Many children lagged behind their expected grade level or were no longer attending school at all; none were accelerated. There was no sex difference in educational attainment.
### Table 2: Mean child height and weight, and mean education, by family type and Bari residence.

<table>
<thead>
<tr>
<th>Family Type</th>
<th>2-Parent</th>
<th>Migrant Labor</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Paternal</td>
<td>Maternal</td>
<td>Neolocal</td>
</tr>
<tr>
<td>Bari Residence</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Height</td>
<td>-1.9</td>
<td>---</td>
<td>-0.6</td>
</tr>
<tr>
<td>N</td>
<td>25</td>
<td>0</td>
<td>24</td>
</tr>
<tr>
<td>Weight</td>
<td>-2.1</td>
<td>---</td>
<td>-0.6</td>
</tr>
<tr>
<td>N</td>
<td>23</td>
<td>0</td>
<td>23</td>
</tr>
<tr>
<td>Education</td>
<td>-1.6</td>
<td>---</td>
<td>-1.3</td>
</tr>
<tr>
<td>N</td>
<td>13</td>
<td>0</td>
<td>7</td>
</tr>
</tbody>
</table>

Notes –

- Departures in standard deviations from the WHO norms for the child’s age and sex.
- Departures in years from age-appropriate attainment.

Chapter 3, Table 2. Mean child height and weight, and mean education, by family type and Bari residence.

Tables 3, 4 and 5 present the results of seven multiple regression models that were run to identify predictors of child height, weight, and educational attainment. The "survey" method in Stata was used to nest sibling groups and avoid pseudo-replication.

Sex, age, adjusted household income, family type, mother’s or father’s education, and number of dependent children in the home are included in all models, as plausible sources of outcome variability.

Because mother’s and father’s education are highly correlated, they are not used as simultaneous predictors. However, father’s education had a markedly greater effect (gain in model $R^2$) on child height and weight than did mother’s education, and the reverse was true with respect to child Educational Attainment, so the more predictive of the two parental education variables was incorporated in the models presented.

Household income was a consistent, strong predictor of height and weight, but had no evident effect on educational attainment. Parental education had a significant positive effect on all outcome measures in all models. Although boys were somewhat
### Chapter 3, Table 3

<table>
<thead>
<tr>
<th>Dependent Variable = HEIGHT</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
<th>Model 5</th>
<th>Model 6</th>
<th>Model 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male sex</td>
<td>.23</td>
<td>.17</td>
<td>.31</td>
<td>.36</td>
<td>.28</td>
<td>.25</td>
<td>.39</td>
</tr>
<tr>
<td>Child age (in years)</td>
<td>-.27, .72</td>
<td>-.32, .65</td>
<td>-.23, .85</td>
<td>-.13, .85</td>
<td>-.24, .80</td>
<td>-.26, .75</td>
<td>-.09, .87</td>
</tr>
<tr>
<td>Adjusted H’tive in income in units of 10K BTK</td>
<td>,72</td>
<td>,65</td>
<td>,85</td>
<td>,85</td>
<td>,80</td>
<td>,75</td>
<td>,87</td>
</tr>
<tr>
<td>Two-parent vs Migrant Labor</td>
<td>,23</td>
<td>,17</td>
<td>,31</td>
<td>,28</td>
<td>,25</td>
<td>,39</td>
<td></td>
</tr>
<tr>
<td>N of dependent children in house</td>
<td>,27</td>
<td>,31</td>
<td>,28</td>
<td>,32</td>
<td>,36</td>
<td>,32</td>
<td>,28</td>
</tr>
<tr>
<td>Father’s education (years)</td>
<td>,01</td>
<td>,05</td>
<td>,01</td>
<td>,06</td>
<td>,04</td>
<td>,05</td>
<td>,06</td>
</tr>
<tr>
<td>Mother’s age</td>
<td>.01</td>
<td>,03</td>
<td>,06</td>
<td>,09</td>
<td>,12</td>
<td>,08</td>
<td></td>
</tr>
<tr>
<td>Maternal grandmother alive</td>
<td>,07</td>
<td>,03</td>
<td>,06</td>
<td>,09</td>
<td>,12</td>
<td>,04</td>
<td>,07</td>
</tr>
<tr>
<td>Paternal grandmother alive</td>
<td>,11</td>
<td>,09</td>
<td>,08</td>
<td>,11</td>
<td>,08</td>
<td>,11</td>
<td>,10</td>
</tr>
<tr>
<td>Maternal grandmother in house</td>
<td>,13</td>
<td>,15</td>
<td>,16</td>
<td>,17</td>
<td>,18</td>
<td>,19</td>
<td>,11</td>
</tr>
<tr>
<td>Paternal grandmother in house</td>
<td>,49</td>
<td>,50</td>
<td>,51</td>
<td>,52</td>
<td>,53</td>
<td>,54</td>
<td>,55</td>
</tr>
<tr>
<td>Maternal bari a</td>
<td>,48</td>
<td>,46, 1.42</td>
<td>,46, 1.62</td>
<td>,10, 1.82</td>
<td>,10, 1.84</td>
<td>,10, 1.86</td>
<td></td>
</tr>
<tr>
<td>Neolocal bari a</td>
<td>,10, 1.82</td>
<td>,10, 1.84</td>
<td>,10, 1.86</td>
<td>,10, 1.88</td>
<td>,10, 1.90</td>
<td>,10, 1.92</td>
<td></td>
</tr>
<tr>
<td>Primary alloparental carer</td>
<td>,70</td>
<td>,25, 1.64</td>
<td>,36</td>
<td>,22, 1.44</td>
<td>,25, 1.64</td>
<td>,36</td>
<td></td>
</tr>
<tr>
<td>- Maternal lineage b</td>
<td></td>
<td>,32, 1.77</td>
<td>,28, 1.44</td>
<td>,22, 1.44</td>
<td>,25, 1.64</td>
<td>,36</td>
<td></td>
</tr>
<tr>
<td>Primary alloparental carer</td>
<td></td>
<td>,19</td>
<td>,24</td>
<td>,22, 1.44</td>
<td>,25, 1.64</td>
<td>,36</td>
<td></td>
</tr>
<tr>
<td>- Neither lineage b</td>
<td></td>
<td>,49, .87</td>
<td>,49, .98</td>
<td>,49, .98</td>
<td>,49, .98</td>
<td>,49, .98</td>
<td></td>
</tr>
<tr>
<td>R²</td>
<td>,29</td>
<td>,30</td>
<td>,31</td>
<td>,32</td>
<td>,32</td>
<td>,32</td>
<td>,32</td>
</tr>
<tr>
<td>N of sibling groups</td>
<td>65</td>
<td>65</td>
<td>65</td>
<td>65</td>
<td>65</td>
<td>65</td>
<td>65</td>
</tr>
</tbody>
</table>

Note: The numbers in each cell are regression coefficients and their 95% confidence intervals. * p < .05, ** p < .01, *** p < .001.

a paternal bari as reference group.
b paternal lineage as reference group.
c paternal grandmother as reference group.

Chapter 3, Table 3. Multiple regression models predicting children’s height relative to WHO norms for the child’s age and sex.
<table>
<thead>
<tr>
<th>Dependent Variable = WEIGHT</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
<th>Model 5</th>
<th>Model 6</th>
<th>Model 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male sex</td>
<td>.03</td>
<td>.01</td>
<td>.14</td>
<td>.11</td>
<td>.14</td>
<td>.06</td>
<td>.13</td>
</tr>
<tr>
<td></td>
<td>-.57,.63</td>
<td>-.60,.61</td>
<td>-.45,.72</td>
<td>-.49,.70</td>
<td>-.44,.73</td>
<td>-.54,.67</td>
<td>-.47,.72</td>
</tr>
<tr>
<td>Child age (in years)</td>
<td>-.12</td>
<td>-.12*</td>
<td>-.12*</td>
<td>-.13*</td>
<td>-.11*</td>
<td>-.12*</td>
<td>-.14**</td>
</tr>
<tr>
<td></td>
<td>-.24,.01</td>
<td>-.24,-.01</td>
<td>-.24,-.03</td>
<td>-.24,-.03</td>
<td>-.22,-.01</td>
<td>-.24,-.01</td>
<td>-.25,-.04</td>
</tr>
<tr>
<td>Adjusted H'hold income in units of 10K BTK</td>
<td>.05*</td>
<td>.05*</td>
<td>.06*</td>
<td>.05*</td>
<td>.05*</td>
<td>.05*</td>
<td>.04*</td>
</tr>
<tr>
<td></td>
<td>.01,.10</td>
<td>.01,.10</td>
<td>.01,.10</td>
<td>.01,.09</td>
<td>.01,.10</td>
<td>.00,.10</td>
<td>.00,.08</td>
</tr>
<tr>
<td>Two-parent vs Migrant</td>
<td>-.24</td>
<td>-.26</td>
<td>-.29</td>
<td>-.51</td>
<td>-.30</td>
<td>-.19</td>
<td>-.59</td>
</tr>
<tr>
<td>Labor</td>
<td>-.88,.40</td>
<td>-.91,.40</td>
<td>-.96,.38</td>
<td>-.124,.22</td>
<td>-.99,.39</td>
<td>-.85,.46</td>
<td>-.13,.13</td>
</tr>
<tr>
<td>N of dependent children in house</td>
<td>-.31</td>
<td>-.28</td>
<td>-.34</td>
<td>-.38</td>
<td>-.35</td>
<td>-.33</td>
<td>-.35</td>
</tr>
<tr>
<td>Father's education (years)</td>
<td>.10*</td>
<td>.11*</td>
<td>.11**</td>
<td>.07*</td>
<td>.09*</td>
<td>.10**</td>
<td>.06*</td>
</tr>
<tr>
<td></td>
<td>.02,.18</td>
<td>.02,.19</td>
<td>.03,.19</td>
<td>.00,.14</td>
<td>.02,.16</td>
<td>.03,.17</td>
<td>.00,.13</td>
</tr>
<tr>
<td>Mother’s age</td>
<td>-.01</td>
<td>-.06,.05</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maternal grandmother alive</td>
<td>.03</td>
<td>-.93,.98</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paternal grandmother alive</td>
<td>-.00</td>
<td>-.002,.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maternal grandmother in house</td>
<td>-.59</td>
<td>-.161,.43</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paternal grandmother in house</td>
<td>-.71</td>
<td>-.149,.07</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maternal bari *(paternal bari as reference group)</td>
<td>.09</td>
<td>-.77,.94</td>
<td>-.211,.62</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neolocal bari *(paternal bari as reference group)</td>
<td>.97**</td>
<td>.91*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary alloparental carer - Maternal lineage b</td>
<td>.73</td>
<td>.33,1.79</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary alloparental carer - Primary alloparental carer - Neither lineage b</td>
<td>.72</td>
<td>-.04,1.47</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary alloparental carer - Maternal grandmother c</td>
<td>.69</td>
<td>.91</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary alloparental carer - Not a grandmother c</td>
<td>.43</td>
<td>.37,1.24</td>
<td>-.46,2.65</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R²</td>
<td>.25</td>
<td>.25</td>
<td>.28</td>
<td>.30</td>
<td>.29</td>
<td>.26</td>
<td>.33</td>
</tr>
<tr>
<td>N of children</td>
<td>97</td>
<td>97</td>
<td>97</td>
<td>97</td>
<td>97</td>
<td>97</td>
<td>97</td>
</tr>
<tr>
<td>N of sibling groups</td>
<td>66</td>
<td>66</td>
<td>66</td>
<td>66</td>
<td>66</td>
<td>66</td>
<td>66</td>
</tr>
</tbody>
</table>

Note - The numbers in each cell are regression coefficients and their 95% confidence intervals. * p < .05, ** p < .01.

a paternal bari as reference group.
b paternal lineage as reference group.
c paternal grandmother as reference group.

Chapter 3, Table 4. Multiple regression models predicting children’s weight relative to WHO norms for the child’s age and sex.
### Table 5

<table>
<thead>
<tr>
<th>Dependent Variable = Educational Attainment</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
<th>Model 5</th>
<th>Model 6</th>
<th>Model 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male sex</td>
<td>-.07</td>
<td>-.14</td>
<td>-.08</td>
<td>-.10</td>
<td>-.08</td>
<td>-.11</td>
<td>-.08</td>
</tr>
<tr>
<td>Child age (in years)</td>
<td>-.53, .38</td>
<td>-.67, .38</td>
<td>-.50, .35</td>
<td>-.58, .38</td>
<td>-.52, .37</td>
<td>-.59, .37</td>
<td>-.58, .42</td>
</tr>
<tr>
<td>Adjusted H’hold income in units of 10K BTK</td>
<td>-.20***</td>
<td>-.19***</td>
<td>-.16**</td>
<td>-.17**</td>
<td>-.17**</td>
<td>-.16**</td>
<td>-.16**</td>
</tr>
<tr>
<td>Two-parent vs Migrant labor</td>
<td>-.30, -.09</td>
<td>-.30, -.09</td>
<td>-.27, -.05</td>
<td>-.28, -.06</td>
<td>-.29, -.05</td>
<td>-.27, -.05</td>
<td>-.24, -.05</td>
</tr>
<tr>
<td>N of dependent children in house</td>
<td>-.06, 05</td>
<td>-.06, 04</td>
<td>-.06, 02</td>
<td>-.05, 02</td>
<td>-.05, 03</td>
<td>-.06, 03</td>
<td>-.06, 02</td>
</tr>
<tr>
<td>Mother’s education (years)</td>
<td>.19***</td>
<td>.16***</td>
<td>.16***</td>
<td>.16***</td>
<td>.15***</td>
<td>.15***</td>
<td>.15***</td>
</tr>
<tr>
<td>Mother’s age</td>
<td>.12, .27</td>
<td>.10, .22</td>
<td>.09, .22</td>
<td>.10, .21</td>
<td>.09, .22</td>
<td>.08, .21</td>
<td>.09, .21</td>
</tr>
<tr>
<td>Maternal grandmother alive</td>
<td>.04</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paternal grandmother alive</td>
<td>-.02, 10</td>
<td>.71*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paternal grandmother alive</td>
<td></td>
<td>.16, 1.27</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maternal grandmother in house</td>
<td>.02</td>
<td>-.55, .58</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paternal grandmother in house</td>
<td>-.33, .32</td>
<td>-.51, .22</td>
<td>-.48, .21</td>
<td>-.46, .22</td>
<td>-.49, .22</td>
<td>-.50, .25</td>
<td>-.49, .25</td>
</tr>
<tr>
<td>Maternal bari a</td>
<td>.77*</td>
<td>.17</td>
<td>.10, 1.43</td>
<td>-.68, 1.03</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neolocal bari a</td>
<td></td>
<td>.27</td>
<td></td>
<td>.24</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary alloparental carer - Maternal lineage b</td>
<td></td>
<td>.83**</td>
<td>.22, 1.43</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary alloparental carer - Neither lineage b</td>
<td></td>
<td>.39</td>
<td>.29, 1.06</td>
<td>.78</td>
<td>.69</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not a grandmother</td>
<td>.01, 1.57</td>
<td>-.14, 1.52</td>
<td>.13</td>
<td>.09</td>
<td>.69, .95</td>
<td>-.71, .89</td>
<td>.45</td>
</tr>
<tr>
<td>N of children</td>
<td>.41</td>
<td>.42</td>
<td>.43</td>
<td>.43</td>
<td>.46</td>
<td>.44</td>
<td>.45</td>
</tr>
<tr>
<td>N of sibling groups</td>
<td>35</td>
<td>35</td>
<td>35</td>
<td>35</td>
<td>35</td>
<td>35</td>
<td>35</td>
</tr>
</tbody>
</table>

**Note** - The numbers in each cell are regression coefficients and their 95% confidence intervals.

* p < .05, ** p < .01, *** p < .001.

* paternal bari as reference group.

** paternal lineage as reference group.

* paternal grandmother as reference group.

Chapter 3, Table 5. Multiple regression models predicting children's educational attainment relative to the norm for the child's age.
less under-height than girls, sex differences are not significant. There is also no evidence of meaningful differences between children from 2-Parent and Migrant Labor families independent of correlated factors, such as income. The extent to which children fell short of WHO weight (but not height) norms increased with age, as did the shortfall in child education. It should be noted that this last effect is in a sense trivial, because each year of age adds one to the maximum number of years that a child could have fallen behind in school. Possible effects of mother’s age were assessed in Model 1 and none were found.

DISCUSSION

Many ethnographers have described rural Bangladesh as highly patrilocal, with scant matrilineal family involvement (Bhuiya et al., 2005; Cain et al., 1979; Holman & O’Connor, 2003; Rao, 2012). Others, however, note the importance of matrilineal ties, particularly in difficult circumstances (Feldman & McCarthy, 1983; Gardner & Ahmed, 2006; Indra & Buchignani, 1997). The current study is the first to show that maternal kin in fact provide significant alloparental assistance. This result is evidence of a difference between norms and behavior, but one cannot quantify that difference without objective measures of norms. What we can say is that stated norms should not be used as a proxy for behavior. The lived experience needs to be assessed as separate from even strong normative beliefs about behavior.

The prevalence of matrilocal residence among migrant labor families was surprising. Perhaps these mothers are able to exercise their own preferences in their husbands’ absence, although matrilocal residence may be preferred by a migrant laborer.
husband himself so he can target his remittances and avoid having them distributed to other kin by his parents or older brother (Rahman, 2010). Determining the reasons for not living patrilocally may shed light on important aspects of extended family dynamics and access to alloparents, particularly during the transition from subsistence agriculture to wage labor, as has been suggested elsewhere (Kasper & Borgerhoff Mulder, 2015).

The individual most likely to provide direct alloparental care was largely dictated by *bari* co-residence, such that primary alloparental caregivers were paternal kin (primarily grandmothers) in patrilocal families and maternal kin (primarily grandmothers) in matrilocal families. Mothers living neolocally received help from both sides equally but infrequently, relying instead on dependent children's elder siblings and those sibling's wives, as well as unrelated neighbors and landlords. Proximity clearly affects alloparental care, but available maternal grandmothers more often filled the role of primary alloparent than did available paternal grandmothers, while families living neolocally and those with low income relied on those people under the control of the dependent child’s mother.

Perhaps the most striking result is that mother’s relatives massively outnumbered their patrilateral counterparts as primary alloparental resource contributors. These resources undoubtedly contribute to children's nutritional status and access to medical care, especially considering that children are routinely well below the WHO norms for height and weight.

Considering that half the families lived patrilocally, and in light of cultural expectations of patrilineal relatives, the predominance of maternal family support is surprising. Widowed, abandoned or divorced women have been reported to rely on their
natal families (Bhuiya et al., 2005; Gardner & Ahmed, 2006; Indra & Buchignani, 1997), and indeed do so in Matlab (see Chapter 5), but no such mothers were included among the interviewees reported upon here. One interviewee explicitly maintained that paternal relatives are supposed to care for their kinsmen’s wives and children, and that a wife’s family should step in only in exceptionally difficult circumstances and if they are wealthier than the husband’s family. Others said much the same, as have researchers working elsewhere in Bangladesh (Feldman & McCarthy, 1983; Gardner & Ahmed, 2006; Indra & Buchignani, 1997). However, the 28 families that received their primary material support from maternal uncles were not especially poor: their average adjusted annual household income was 71,700 BTK, whereas the average for the entire sample was 79,100 BTK. (Fathers’ brothers, by contrast, were primary resource providers for families with an average income of 108,900 BTK.) Thus, unless the women’s reports are biased, their natal kin are more involved after marriage than the local ideology and much of the ethnographic literature indicate.

Matlab has undergone a dramatic demographic transition. The infant mortality rate fell by 79.8% between 1978 and 2013, and the under-5 mortality rate even more. In 1966, life expectancy at birth was 53 years for men and 51 for women; by 2013, it was 70 years for men and 74 for women. The total fertility rate has also fallen dramatically, from 6.7 children per woman in 1966 to 2.5 in 2013 (icddr,b, 2015). As in other developing nations, these changes are co-occurring with a transition toward a market-based economy and paid labor outside the home (Rahman, 2010; Shenk et al., 2013), and have impacts on families and child care arrangements (Fraser Schoen, 2014; Shenk et al., 2013). There has also been a significant increase in girls’ education, and more poor girls now attend high
school than poor boys, perhaps because boys are able to work without additional
education and there are targeted education promotion programs for girls (Asfar, 2009;
Fraser Schoen, 2014; International Labour Migration, 2015).

It is noteworthy that girls and boys did not differ significantly on any outcome
measure. Preferential treatment of sons once prevailed in Matlab (Chen et al., 1981), as
is true elsewhere in south Asia, but discriminative treatment has apparently waned
significantly, such that boys no longer survive better than girls (icddr,b, 2015).

Relatively educated girls are more likely to “marry up” (Rao, 2012; Blunch &
Das, 2014), suggesting that mothers' brothers may be investing in enabling their nieces to
marry hypergynously. Shenk et al. (2013) have reported that the daughters of migrant
laborers are especially well educated, and the same was true in the data collected here,
but the difference between Migrant Labor and 2-Parent families disappeared when family
income was controlled; these patterns suggest that remittances from absent fathers may
also function, in part, as investments in the upward mobility of their daughters.

That children residing patrilocally were especially short, underweight and behind
in school may indicate that patrilocal families are more traditional, and encourage
agricultural work over education. Engaged in the physical demands of agriculture, these
children may then have greater nutritional needs, resulting in their shorter stature and
lower weight. Additional research would be required to determine whether this is so, but
this pattern would be in keeping with increases in wage and migrant labor and the
associated requirements for greater education and reduced reliance on agriculture and
child labor (Cain, 1977; icddr,b, 2015; Rahman 2010; Rao, 2012). Regardless of whether
families subsist as agriculturalists, they rely on seasonally available foods and are subject
to fluctuating food costs. This may be why higher numbers of dependent children in the home appear to have had an adverse effect on children's weight (albeit not a significant effect), but not on their height (or education). Weight may reflect more temporary shortfalls in meeting children’s needs than does height.

Are child outcomes affected by the lineage of allocarental helpers? Matrilocal residence and the maternal grandmother providing primary allocarental care were both associated with better educational outcomes for children, net of income and parental education. This suggests that maternal grandmothers and the maternal family environment promote child education more than do paternal relatives. Due to reduced fertility, mothers have fewer sons, many of whom may be away as migrant laborers (ICDDR,B, 2015). Daughters are therefore under increasing pressure to provide for their natal family’s financial and direct care, responsibilities that were the traditional domain of sons (Fraser Schoen, 2014; Rao, 2012). Well educated daughters who marry hypergynously are more likely to have the resources to assist their natal families, and are less likely to return home in situations of poverty (Fraser Schoen, 2014; Indra & Buchignani, 1997). If sons are educated, they can make more money in wage labor than agriculture (Fraser Schoen, 2014; Indra & Buchignani, 1997), although the data reported here suggest that migrant laborers can earn substantial income even with limited education. The focus on education by maternal family may be associated with reduced family size, moves to less agricultural based subsistence, and changing expectations of sons and daughters. The novel long term benefits of child education for maternal family may be the reason for greater maternal investment in education, and why this disparity is not seen in the other child outcomes.
The data here indicate that maternal and nuclear family are important alloparental carers in a traditionally patrilocal society. This may reflect recent change, but it may also be the case that matrilineal assistance has long been substantial. What people say and what they do can be quite different (Pelto & Pelto, 1975), and bilineal family connections are maintained in some highly patrilocal societies, as Fortes (1969) stressed. More recent data from patrilocal societies who have experienced less social and demographic change than in Matlab reinforce this point. Borgerhoff Mulder (2007) found that Kipsigis women, despite living patrilocally, received support from maternal relatives that increased with the number of maternal uncles and significantly enhanced child survival. Among the patrilocal Himba, Scelza (2011) reports that:

“...women consistently return to stay with kin around the time of giving birth. Divorce and death of a spouse also trigger a return to living with kin, leading to a cumulative pattern of kin coresidence across the lifespan. These data suggest that patrilocality may be less of a constraint on female kin support than has been previously assumed.” (pp. 377)

Open-ended interviews explored where Matlab women would ideally give birth, and almost every respondent said her natal home. This was not a mere wish: most women did return to their natal homes prior to childbirth, often remaining there until the child was almost a year old. There was no indication that this is a novel phenomenon. Clearly, matrilineal connections are important, and patrilocality may not constrain maternal family investment to the extent that some ethnographies suggest.
CHAPTER 4

GOING HOME: HOW MOTHERS MAINTAIN NATAL FAMILY TIES IN A PATRILOCAL SOCIETY?

ABSTRACT

The prevalence and importance of alloparents in child-rearing have led theorists to characterize the human animal as a "cooperative breeder", and to interpret grandmothering of daughters’ children as a human adaptation. But is alloparental care by mothers’ relatives as cross-culturally ubiquitous as these theories often imply? Patrilocal marriage is normative in many societies, and one may question whether the mother's kin can and do provide alloparental assistance in such societies. Do women maintain strong relationships with their natal families even when postmarital residence norms and practice are predominantly patrilocal? To address this question, I analyse and compare the visiting behaviour of 151 interviewed mothers of dependent children in rural Bangladesh. Despite the impediments erected by patrilocality and purdah, mothers visited their mothers and brothers (their children’s maternal grandmothers and uncles) surprisingly often, and significantly more frequently than they visited equivalent patrilateral relatives after controlling for accessibility. This preference for visiting matrilateral relatives persists in analyses controlling for proximity, husbands’ and uncles’ migrant labor status, and the respondent’s age, post marital residence, family income, and marital status (intact marriage versus widowed or divorced). Previous analyses from the same interviews show greater alloparental investment from matrilateral family than
would be expected on the basis of co-residence, and improved child outcomes when maternal grandmothers provide alloparental care, results that mirror the visiting propensity reported here. These findings provide support for the proposition that matrilateral alloparental care may be a human universal.

INTRODUCTION

Human beings have comparatively long childhoods, and multiparous women typically give birth while one or more older children still require provisioning and care. This unusual life history co-evolved with a form of cooperative breeding whereby various alloparents, mainly close kin, help parents raise their children (Hrdy, 2009; Konner, 2010).

The mother’s relatives are more heavily involved in alloparenting than the father’s, with maternal grandmothers playing an especially large role (e.g. Euler & Michalski, 2008; Gaulin et al., 1997; Sear & Mace, 2008; Pollet et al., 2009; Coall & Hertwig, 2010; Perry et al., 2014). Generalizing may be premature, however, because almost all explicit comparisons of matrilateral versus patrilateral alloparenting have been conducted in societies in which marriage is predominantly neolocal, especially modern western nations. Are mother’s relatives heavily involved even in patrilocal societies?

In at least one such society, the answer is "yes". Marriage in Matlab, Bangladesh is normatively patrilocal, with patrilineal families occupying joint family compounds, or baris, where a senior couple resides with their sons, daughter-in-laws and grandchildren. According to one ethnography,
"The custom of patrilocal marriage removes a newly married woman from her family of birth and places her in her husband's locality. Preference for lineage and village exogamy attenuates a woman's ties with her family of birth and reduces the possibility that her family will intervene on her behalf after marriage.” (Cain et al., 1979, pp. 406-407).

More recent accounts similarly imply that married women lose contact with their natal families and must rely on their in-laws for support (Amin, 1998; Bhuiya et al., 2005; Kenner et al., 2008; Rao, 2012). But despite the obstacles, mothers in fact derive substantial alloparental assistance from their natal families. I have previously reported (Perry, in press) that (a) most mothers of young children in intact first marriages indeed reside in their in-laws’ baris, but a substantial minority do not (43% of those whose husbands are present, and 49% of those whose husbands are absent as migrant laborers); (b) maternal grandmothers provide more childcare than would be expected on the basis of bari co-residence, and paternal grandmothers provide less; and (c) material investments in children by persons outside the immediate household come primarily from the mother’s relatives, especially her brothers.

In the modern west, intergenerational investment has been linked to visiting patterns (Essock-Vitale & McGuire, 1985; Lawton et al., 1994; Euler & Weitzel, 1996; Pollet et al., 2008; Tanskanen & Danielsbacka, 2012), and women and their children tend to visit the children’s maternal relatives more often than paternal relatives, even when proximity is controlled (Euler & Michalski, 2008; Pollet et al., 2006, 2013; Smith, 1988; Uhlenberg & Hammill, 1998). These visiting patterns may reflect both relationship closeness and a specific motivation to maintain access to alloparental support (Uhlenberg & Hammill, 1998; Scelza & Bliege-Bird, 2008). Indeed, a woman’s emotional closeness
to her mother and to her mother-in-law appears to mediate the receipt of childcare assistance from them (Danielsbacka et al., 2015).

How do married women in rural Bangladesh maintain the ties with their natal families that make alloparental investment possible? I address this question by analyzing women’s self-reported visiting practices, addressing how marital status, postmarital residence practices, familial laterality, family income, and the required travel time combine to determine who is visited and how often. The Matlab population is about 90% Muslim and 10% Hindu, and purdah (the seclusion of women) is observed by both religious groups (Feldman & McCarthy, 1983; Harris, 2001; icddr, b, 2015), which further limits women’s ability to visit family and friends, especially when a bari is relatively isolated in the midst of rice paddies, as is often the case. Nevertheless, almost all mothers of young children make the efforts necessary to visit their own mothers and other relatives.

METHODS

Matlab, Bangladesh, was chosen as the field site because of its patrilocal and patrilineal social structure, quality census data, and a 50-year history of research with the local population. To mitigate the limitations of any single methodology, a mixed-methods approach was used, involving structured interviews, open-ended interviews, and anthropometric measures (see Chapter 3 for further details).

The International Centre for Diarrhoeal Disease Research, Bangladesh (icddr,b) has been collecting information on every household in Matlab (population about 230,000) since 1964, recording each birth, death, in-migration, out-migration,
marriage, and divorce, at frequent intervals (currently every two months; icddr,b 2015). The resultant database permits analysts to draw random samples on various criteria from across the jurisdiction. Data reported here span four family types, namely two-parent families and three kinds of one-parent families: where fathers are absent due to migrant labor, where fathers are deceased, and where parents are estranged or divorced. These family types range from normative to shameful (Bhuiya et al. 2005; Rahman 1997) and provide a window on how mothers maintain family connections across those circumstances.

Random samples of 100 families of each type were drawn from the icddr,b database. Inclusion criteria were that the primary caregiver was at least 19 years old, and that she had one or more children under the age of 13 years. Primary caregivers from these random samples were then approached for interview, and 175 such interviews were completed within the available timeframe of the study; only two potential interviewees who were approached refused to participate. In this report, analysis is confined to cases in which the primary caregiver was the child’s birth mother (N = 151).

The joint family structure and bari residence practices in Bangladesh necessitate that we define “visiting”. A bari typically contains several households, but because women do much of their work in a communal bari yard and encounter one another at open doorways and windows, maintaining contact with bari co-residents requires little effort and may even be difficult to avoid. Thus only contacts with people outside of the respondent’s bari are considered “visiting”. Questions focused on the mothers’ visiting of their natal kin and in-laws; I did not ask whether a child was present during the visit,
nor about visits by others to the respondent’s home, nor about visiting that did not include the respondent, since the issue of interest is the effort mothers make to maintain relationships with extended family.

One hundred and fifty one mothers (60 in 2-parent families, 52 in migrant labor families, 28 widows, and 11 divorcées), with a total of 245 dependent children, participated in structured interviews which consisted of standardized questions and required about an hour to complete. (The number of divorcees is low because most of the random sample that was drawn on this criterion consisted of women with a past divorce but no children of that former marriage, and thus did not fit the intended criterion of women raising children of divorce. Widows are also relatively few because their children were often being reared by primary caretakers other than the mothers.) Questions elicited basic demographic information, family income, co-bari and co-household residence, the identities of child care providers and resource provisioners, and education levels of the parents and children. Most importantly, for present purposes, each respondent was asked how often she visited each of her and her husband’s living parents and siblings who did not reside in the same bari as the respondent, and the requisite travel time to visit them.

RESULTS

VISITING MOTHERS AND MOTHERS-IN-LAW (THE CHILDREN’S GRANDMOTHERS)

Table 1 enumerates the women in each respondent group, as well how many of their mothers and mothers-in-law were deceased, dwelt in the same bari as the
respondent, or dwelt elsewhere. The column headed "not in the same bari" thus gives the numbers who were potentially available to be visited.

<table>
<thead>
<tr>
<th>Family type</th>
<th>N of respondents</th>
<th>Own mother deceased</th>
<th>not in same bari</th>
<th>Mother-in-law deceased</th>
<th>not in same bari</th>
</tr>
</thead>
<tbody>
<tr>
<td>Co-reside with husband</td>
<td>60</td>
<td>5*</td>
<td>6</td>
<td>49</td>
<td>16*</td>
</tr>
<tr>
<td>Migrant labor</td>
<td>52</td>
<td>5</td>
<td>12</td>
<td>35</td>
<td>16</td>
</tr>
<tr>
<td>Widow</td>
<td>28</td>
<td>12</td>
<td>2</td>
<td>14</td>
<td>19</td>
</tr>
<tr>
<td>Divorce</td>
<td>11</td>
<td>2</td>
<td>7</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

* The category “deceased” includes one case in which the respondent did not know whether her mother was alive, and one case in which the same was true for the mother-in-law.

Chapter 4, Table 1. Numbers of respondents in each family type and the status (whether living and, if so, where) of their mothers and mothers-in-law.

There were 139 grandmothers who were potentially visitable (i.e. alive and not dwelling in the same bari as the respondent): 100 mothers (maternal grandmothers) and 39 mothers-in-law (paternal grandmothers). Visiting data were available for 136 of these: 99 mothers and 37 mothers-in-law. Figure 1 portrays the percentages of those mothers and mothers-in-law who were reportedly visited at various frequencies. Mothers were visited at significantly higher frequencies than mother-in-laws, who were substantially more likely to be visited rarely or not at all ($\chi^2_{4 df} = 17.56, p = .002$).

Differential frequency of visiting could, in principle, result from differential proximity, so it is important to control for accessibility. An ordinal logistic (ologit) regression was therefore conducted, with frequency of visitation as the (ordinal) dependent variable, and six potential predictors: requisite travel time (ordinal), laterality of grandmother, respondent’s age, the respondent’s family income, and two family-type dummy variables. One family-type dummy ("no husband") contrasted widows and
divorcées with women in intact marriages because marital disruption could terminate or reduce patrilateral contacts for children who remain with their mothers (Drew & Silverstein, 2007); the other dummy distinguished migrant labor families from all other family types on the grounds that contact with the father's family may be affected by his presence/absence. Household income (see Chapter 3 for details) was adjusted for family size by dividing by the square root of the number of household residents (see, e.g., Johnson et al., 2005).

Table 2 shows the results of this analysis. As expected, lower accessibility (greater travel time) was associated with relatively infrequent visiting, but the grandmother laterality effect persisted, with women visiting the children’s maternal grandmothers (their own mothers) more often than the paternal grandmothers (their mothers-in-law). None of the other potential predictors had a significant effect.
<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Coefficient</th>
<th>95% Confidence Interval</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distance (travel time)</td>
<td>-.586</td>
<td>-.795 - .377</td>
<td>.000</td>
</tr>
<tr>
<td>Laterality (Mother-in-law = 0; Mother = 1)</td>
<td>.862</td>
<td>.092 - 1.631</td>
<td>.028</td>
</tr>
<tr>
<td>Respondent’s Age</td>
<td>-.003</td>
<td>-.048 - .042</td>
<td>.903</td>
</tr>
<tr>
<td>Adjusted Household Income (100,000BTK)</td>
<td>-.282</td>
<td>-.767 - .202</td>
<td>.253</td>
</tr>
<tr>
<td>Migrant Labor dummy</td>
<td>.352</td>
<td>-.365 - 1.070</td>
<td>.336</td>
</tr>
<tr>
<td>No Husband dummy</td>
<td>-.550</td>
<td>-1.556 - .457</td>
<td>.284</td>
</tr>
</tbody>
</table>

Chapter 4, Table 2. Results of an ordinal logistic regression (“ologit”) analysis of the predictors of women’s frequency of visiting their children’s grandmothers, given that the latter were known to be alive and were not residing in the same bari as the respondent. (N = 130; Pseudo $R^2 = 0.11$)

As expected, the widow and divorcée groups often had little contact with their children’s paternal grandmothers: only 10% of potentially visitable mothers-in-law (1 of 10) were in fact visited more than once a year, compared to 75% of potentially visitable mothers (12 of 16), a significant difference (1-tailed $p = .002$ by Fisher exact test). For respondents in intact marriages (the two-parent and migrant labour groups), the corresponding contrast was greatly diminished and only marginally significant: 70% of potentially visitable mothers-in-law (19 of 27) were visited more than once a year, compared to 87% of potentially visitable mothers (72 of 83); 1-tailed $p = .052$ by Fisher exact test.

Patrilocality is not a variable in the above analysis because only four patrilocally residing respondents had mothers-in-law who met the definition of visitable. But does patrilocal residence affect the rates at which women visit their own mothers? Another ologit regression was conducted comparing women who were living patrilocally to other women to see if patrilocality resulted in different visiting frequencies with their own mothers compared to non-patrilocal respondents (Table 3). There was no significant effect of patrilocality on visiting frequency.
Chapter 4, Table 3. Results of an ologit analysis of the predictors of women’s frequency of visiting their own mothers, given that the latter were known to be alive and were not residing in the same bari as the respondent. (N = 96; Pseudo R² = 0.12)

To further address the potential influence of residence on visiting, a further analysis was conducted including only neolocally living respondents who dwelt with neither their mothers nor their mothers-in-law, although both were alive. The results are shown in Table 4. Even though the sample size is small (45 cases), laterality and distance continue to be significant predictors of visiting, with maternal grandmothers and closer grandmothers visited more often.

Chapter 4, Table 4. Results of an ologit analysis of the predictors of neolocally residing women’s frequency of visiting their mothers and mothers-in-laws, given that the latter were known to be alive and were not residing in the same bari as the respondent. (N = 45; Pseudo R² = 0.18)

In sum, the requisite travel time is a strong predictor of visiting frequency, as expected, in all analyses, but the tendency for respondents to visit their mothers more often than their mothers-in-law persists net of distance. Figure 2 shows the effects of laterality and proximity (dichotomized) when respondents are partitioned into those in
Chapter 4, Figure 2: Proportions of the respondents’ mothers and mothers-in-laws who were visited at various frequencies. Data are confined to women who did not co-reside in the same bari as the respondent. The panels are set out based on travel time (A & C less than an hour away, and B & D more than an hour away) and whether the respondent was in an intact marriage or non-intact family (widow or divorcée).
intact marriages (the two-parent and migrant labor groups) and those whose marital relationships have ended (the widows and divorcées). It is evident that widows and divorcées often have little or no contact with their mothers-in-law, but even women whose relationships with their husbands remain intact exhibit preferential visiting of their own mothers over their mothers-in-law, especially when distance makes visiting demanding.

VISITING BROTHERS AND BROTHERS-IN-LAW (THE CHILDREN'S UNCLEs)

Almost all respondents (147 of 151) had living brothers, and most (129 of 151) had living brothers-in-law. In total, respondents had 368 brothers and 332 brothers-in-law. Because of patrilocal residence patterns, the latter were more likely than the former to reside in the respondent's *bari*, and thus to be ineligible for "visiting" as defined here. Table 5 shows that 131 respondents had one or more potentially visitable brothers, whereas only 78 had eligible brothers-in-law. Many of these brothers-in-law who were not co-residing in the same bari as the respondent were migrant laborers, which is discussed further in this article.

<table>
<thead>
<tr>
<th>Family type</th>
<th>N of respondents</th>
<th>N with living brother(s)</th>
<th>N with living brother(s) not in same bari</th>
<th>N with living brother(s)-in-law</th>
<th>N with living brother(s)-in-law not in same bari</th>
</tr>
</thead>
<tbody>
<tr>
<td>Co-reside with husband</td>
<td>60</td>
<td>59</td>
<td>54</td>
<td>51</td>
<td>29</td>
</tr>
<tr>
<td>Migrant labor</td>
<td>52</td>
<td>50</td>
<td>45</td>
<td>47 *</td>
<td>32</td>
</tr>
<tr>
<td>Widow</td>
<td>28</td>
<td>28</td>
<td>26</td>
<td>23 *</td>
<td>10</td>
</tr>
<tr>
<td>Divorce</td>
<td>11</td>
<td>10</td>
<td>6</td>
<td>8</td>
<td>7</td>
</tr>
</tbody>
</table>

* One additional Migrant labor respondent and one additional Widowed respondent had lost contact with their in-laws and did not know whether their brothers-in-law were still alive.

Chapter 4, Table 5. Numbers of respondents in each family type with living brothers or brothers-in-law.
The relative frequencies at which respondents visited their most frequently visited eligible brother and their most frequently visited eligible brother-in-law are portrayed in Figure 3. The women reported visiting brothers significantly more frequently than brothers-in-law ($\chi^2_{4 \text{ df}} = 20.98, p < .001$). In fact, slightly more than half of the respondents said that they never visited their brothers-in-law at all.

![Chapter 4, Figure 3. Percentages of the respondents' most frequently visited eligible brothers versus brothers-in-law who were visited at various frequencies.](image)

A multivariate analysis is again necessary to assess whether the difference in visiting brothers versus brothers-in-law is due merely to differential accessibility, and an ordinal logistic (ologit) regression was therefore conducted analogous to that in Table 2. The results are presented in Table 6, and resemble those for grandmothers: lower accessibility (greater requisite travel time) indeed deterred visiting, brothers were visited more than brothers-in-law, and no other potential predictor had any apparent effect. Unlike the case with the grandmothers, however, the laterality effect in the uncles data is statistically significant only at the 0.10 level.
<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Coefficient</th>
<th>95% Confidence Interval</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distance (travel time)</td>
<td>-.814</td>
<td>-.966</td>
<td>-.662</td>
</tr>
<tr>
<td>Laterality (Brother-in-law = 0; Brother = 1)</td>
<td>-.519</td>
<td>-1.118</td>
<td>.080</td>
</tr>
<tr>
<td>Respondent's Age</td>
<td>-.021</td>
<td>-.060</td>
<td>.019</td>
</tr>
<tr>
<td>Adjusted H'hold Income (100K BTK)</td>
<td>-.252</td>
<td>-6.830</td>
<td>1.790</td>
</tr>
<tr>
<td>Migrant Labor dummy</td>
<td>.221</td>
<td>-.402</td>
<td>.844</td>
</tr>
<tr>
<td>No Husband dummy</td>
<td>-.066</td>
<td>-.856</td>
<td>.723</td>
</tr>
</tbody>
</table>

Chapter 4, Table 6. Results of an ologit analysis of the predictors of women's frequency of visiting their children's most frequently visited maternal and most frequently visited paternal uncles. (N = 200; Pseudo R² = 0.23)

Because of the prevalence of patrilineal joint families in Matlab, a woman's adult brothers and brothers-in-law often reside in the same *bari* as their own mothers, the focal woman's mother or mother-in-law, and it is therefore unclear whether the observed tendency to visit brothers more than brothers-in-law might simply follow from the preferential visiting of mothers over mothers-in-law. To assess whether there is a laterality effect in visiting one's children's uncles that is independent of visiting grandmothers, a further analysis was conducted using the data for only those brothers (n = 64) and brothers-in-law (n = 45) who dwelt neither in the same *bari* as their own mothers nor in that of the respondent, and who were not themselves migrant laborers and thus inaccessible. (Differential visiting of brothers *versus* brothers-in-law could, in principle, derive from differential participation in migrant labor, since migrant laborers, even within Bangladesh, resided too far away for visiting to be feasible, but as it happens, almost identical percentages of the respondents' brothers (39.6%) and brothers-in-laws (39.7%) were migrant laborers at the time of interview.) Table 7 presents the relevant ologit regression.
<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Coefficient</th>
<th>95% Confidence Interval</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distance (travel time)</td>
<td>-.627</td>
<td>-.822 -.432</td>
<td>.000</td>
</tr>
<tr>
<td>Laterality (Brother-in-law = 0; Brother = 1)</td>
<td>-.927</td>
<td>-1.758 -.096</td>
<td>.029</td>
</tr>
<tr>
<td>Respondent’s Age</td>
<td>-.094</td>
<td>-.157 -.032</td>
<td>.003</td>
</tr>
<tr>
<td>Adjusted Household Income (100K BTK)</td>
<td>.186</td>
<td>-5.780 9.490</td>
<td>.634</td>
</tr>
<tr>
<td>Migrant Labor dummy</td>
<td>-.262</td>
<td>-1.29 .765</td>
<td>.617</td>
</tr>
<tr>
<td>No Husband dummy</td>
<td>.794</td>
<td>-.237 1.825</td>
<td>.131</td>
</tr>
</tbody>
</table>

Chapter 4, Table 7. Results of an ologit analysis of the predictors of women’s frequency of visiting their brothers and brothers-in-law (their children's maternal and paternal uncles) who did not reside in the same *bari* as either their own mother or the respondent. (N = 109; Pseudo $R^2 = 0.17$)

A further analysis, not presented here, showed that as was the case with visiting one’s own mother, patrilocal residence had no effect on visiting one's brothers. Finally, Figure 4 presents a breakdown of the uncle data analogous to that for grandmothers in Figure 2, with similar results: preferential visiting of brothers over brothers-in-law is evident for those both near and far, and regardless of whether the respondent's marriage was still intact.
Chapter 4, Figure 4: Proportions of the respondents' brothers and brothers-in-laws who were visited at various frequencies. Data are confined to men who did not co-reside in the same bari as the respondent and were not migrant laborers. The panels are set out based on travel time (A & C less than an hour away, and B & D more than an hour away) and whether the respondent was in an intact marriage or non-intact family (widow or divorcée).
DISCUSSION

Respondents visited their own mothers at higher frequencies than their mothers-in-law, and this difference did not derive from differences in proximity or residence type (patrilocal, matrilocal or neolocal). Preferential visiting of one’s own mother was, unsurprisingly, especially true of widows and divorcées, many of whom were no longer in contact with their former in-laws (see also Bhuiya et al., 2005; Rahman, 1997; Shenk et al., 2013). But even women in intact marriages visited their mothers more than mothers-in-law with whom they did not reside. Despite the fact that patrilocal marriage and purdah remain both normative and prevalent, young mothers make the effort to visit their own mothers; only 3 of 99 respondents who had living mothers residing elsewhere reported that they never visited them.

Analyses in Chapter 3 show that the respondents’ mothers provided more childcare than one would expect on the basis of bari co-residence. Their mothers-in-law (the children’s paternal grandmothers) also provided substantial alloparental care, but less than what would be expected on the basis of co-residence. Moreover, children whose primary alloparental caregiver was their maternal grandmother exhibited significantly better height-for-age and educational attainment than those whose primary alloparental caregiver was either their paternal grandmother or someone other than a grandmother (see Chapter 3).

These results imply strong mother-daughter relationships that endure under patrilocality. Mothers in Matlab rely on their mothers at critical times. Respondents in open-ended interviews were unanimous in stating that women prefer to return to their own mother’s home to give birth, for example, and to remain there for weeks or even
several months after the child is born; all maintained that this is a common and long-standing practice (Perry, in press). Visiting presumably helps maintain those ties. In other studies elsewhere, women are typically the people who maintain family relationships, particularly through contact between mothers and daughters (Spitze & Logan, 1990; Uhlenberg & Hammill, 1998; Scelza & Bliege Bird, 2008), and the frequency of such contacts may be indicative of both investment in these relationships and one’s confidence that natal family support will remain available, as has been found elsewhere (King & Elder, 1995; Gardner & Ahmed, 2006; Danielsbacka et al., 2015).

As with mothers versus mother-in-laws, respondents visited their brothers more frequently than their brothers-in-laws. This, too, appears to constitute an "investment” in maintaining an important avenue of support, given that women reported receiving more material and financial support for their children from their brothers than from any other category of helper outside the household, including their mothers (Perry, in press). These maternal uncles reportedly provided much more support than paternal uncles, despite normative claims that it is the latter’s responsibility to provide for children when fathers cannot do so alone, and there is no evidence in these women’s reports that support from paternal uncles becomes prominent in situations of elevated need (such as lower family income or more difficult family circumstance: widowhood or divorce). Patrilocal residence did not have a significant effect on respondents’ frequency of visiting their brothers.

Should we be surprised by the extent to which women in rural Bangladesh maintain contact with their natal families, and derive significant support from them? Not necessarily. Although patrilocal marriage and purdah clearly impede these contacts,
researchers have documented apparently similar phenomena in several patrilocal societies. Judd (1989) has described the norms by which women in Shandong, China, continue to visit their natal families after marriage and engage in accepted reciprocal investments in each other’s lives. Among the Kipsigis of Kenya, the presence of maternal uncles is associated with reduced child mortality in poor families, presumably because of investments by those uncles (Borgerhoff Mulder, 2007). Among the Martu of Australia, Scelza and Bliege-Bird (2008) report that strong cooperative relationships between mothers and daughters persist in spite of patrilocality, and Scelza (2011) has noted that women return to their natal homes to give birth among the patrilocal Himba of Namibia, as do the women in Matlab.

One important implication of these results is that postmarital residence norms are imperfect indicators of contact with kin, and that co-residence may be a poor proxy for alloparenthal caregiving. The quote in the introduction of this paper (Cain et al., 1979, pp. 406-407) seems to be out of sync with the data presented here. Patrilocality matters, but women maintain strong relationships with their natal families if they can. The following quote gives some indication of this relationship: “Although women move to their husbands’ households at marriage and in principle have duties first and foremost to their in-laws, in practice both men and women tend to remain in close contact with maternal kin and, in extremis, would also feel morally obliged to help them” (Gardner & Ahmed, 2006, pp. 20). Although this quote is more in keeping with some of the data presented here, it still implies matrilateral family help in particularly difficult circumstances, whereas in the present study, higher rates of visiting matrilateral family persist across all
family types, even when controlling for income. These quotes may reflect more of a cultural ideology than an accurate portrayal of behavior.
CHAPTER 5

WHO INVESTS IN CHILDREN IN NON-INTACT FAMILIES IN RURAL BANGLADESH?

ABSTRACT

Parents rely on child-care assistance and material support from "alloparents", perhaps especially in developing nations with limited government-funded social services and when marriages are disrupted by death or divorce. This interview study focuses on determining who helps raise children in rural Bangladesh after parental death or divorce, comparing the findings to those from intact families in which the father is either present or absent as a migrant laborer. Family types differed with respect to where children reside, who served as their primary and secondary caregivers, and who provided material support, but the mother's kin played a major role in all family types, especially as material resource providers. Household income was a strong predictor of child height and weight, which were not demonstrably associated with family type when income was controlled. The surviving children of deceased mothers moved between successive caregivers especially frequently, and were uniquely likely to have no schooling.

INTRODUCTION

Alloparents - those who help rear other people’s children - can have significant effects on children’s well-being and development (Gibson & Mace, 2005; Hrdy, 2009; Konner, 2010). Knowing who provides this direct care and material investment may have important implications for policies relating to child welfare and development. Understanding alloparental assistance in difficult circumstances such as parental death or
divorce, as compared to who helps in normative two-parent families, can illuminate the needs of children in different situations and inform policies for targeting assistance to needy families when extended family cannot or will not provide adequate support.

A substantial body of research has focused on alloparental assistance to nuclear families who reside neolocally (that is, apart from both spouses’ natal families) in the modern West (e.g. Danielsbacka et al., 2011; Essock-Vitale & McGuire, 1985; Euler & Weitzel, 1996; Gaulin et al., 1997; Kaptijn et al., 2010; Pashos & McBurney, 2008; Pollet et al., 2006). In general, the presence of the maternal grandmother is associated with positive child outcomes (review by Coall & Hertwig, 2010), which is also often the case in small-scale and less developed societies (Fox et al. 2010; Sear & Mace 2008), but the studies suggesting beneficial effects of the maternal grandmother have included little or no observational or interview evidence on actual alloparental participation. A few studies in traditional societies also implicate older siblings as important childcare providers, in addition to grandmothers and other, primarily matrilateral, kin (Hawkes et al., 1989, 1997; Kramer, 2005; Strassman, 2011).

Postmarital residence is often patrilocal (i.e. the bride moves to her husband’s family) in traditional societies (Murdock & Wilson, 1972), and one might expect that such living arrangements would make maternal kin relatively inaccessible and paternal kin the predominant alloparents. According to one ethnographic account of life in rural Bangladesh, for example:

“The custom of patrilocal marriage removes a newly married woman from her family of birth and places her in her husband's locality. Preference for lineage and village exogamy attenuates a woman's ties with her family of
birth and reduces the possibility that her family will intervene on her behalf after marriage” (Cain et al. 1979, pp. 406).

Studies of alloparenting in normatively patrilocal societies are few, but the available evidence indicates that although paternal kin do indeed play a substantial role, maternal kin also remain heavily involved (Borgerhoff Mulder, 2007; Huber & Breedlove, 2007; Scelza, 2011; Scelza & Bliege-Bird, 2008; Chapter 3 of this dissertation). More research in normatively patrilocal societies, which are common in developing nations, is needed for developing culturally relevant and effective child development and welfare policies.

Apart from some studies of fosterage and adoption (Hagen, 2001; Rende Taylor, 2005; Silk, 1990) another gap in the literature has been a lack of explicit comparison between the experiences, in traditional societies, of children in intact families versus those who have suffered parental death or divorce. The latter are at risk for poorer outcomes in the West, including elevated levels of short- and long-term mental health problems and poverty-related deficits (Amato & Anthony, 2014; Cerel et al., 2000), and in developing nations they are at risk for poorer physical development, health, and education outcomes, as well as higher mortality (Mwangome et al., 2012; Ronsmans et al., 2010; Roy, 2000; Shenk et al., 2013). Shenk, Starkweather, Kress and Alam (2013) have investigated child outcomes in the patrilocal society of rural Bangladesh and explicitly examined the effects of father absence due to death, divorce or estrangement, and migrant labor, but they did not include situations of maternal death, nor did they focus explicitly on allopertual care and assistance.
Matlab, Bangladesh is an excellent setting for investigating these issues. The International Centre for Diarrhoeal Disease Research, Bangladesh (icddr,b: a public health-focused NGO) has been situated there for over 50 years, conducting frequent censuses that track changes in family configuration over time in every household in the Matlab Upazila (a subdistrict with a population of about 230,000 people). Substantial ethnographic work has been conducted in Matlab, which continues to be described as normatively patrilocal, with patrilineal families occupying joint family compounds, or baris, in which a senior couple typically resides with their sons, daughter-in-laws, and grandchildren (Amin, 1998; Bhuiya et al., 2005; Cain et al., 1979; Kenner et al., 2008; Rao, 2012). These accounts suggest that married women have little contact with their natal families and must rely on their in-laws for support, but there are grounds for thinking this may be an overstatement; perhaps most notably in the fact that married women often return temporarily to their natal homes to give birth and begin rearing their infants (Perry, in press).

According to the icddr,b census data, the two most common family settings for dependent children are intact families in which the both parents are present and migrant labor families where the husband is away for work in another city or country. However, there are also many dependent children whose mother or father is deceased, and many others whose parents are divorced or estranged (icddr,b, 2015), permitting comparisons with respect to living arrangements in terms of who helps, and how the children fare. The study reported here focuses on how primary caregivers obtain the alloparental assistance that they need across two intact and three non-intact family types. The intact
types are Two-Parent and Migrant Labor families; the others are families containing the children of Widows, of Divorce or Estrangement, and of Deceased Mothers.

Despite the obstacles, Matlab mothers in intact marriages derive substantial alloparental assistance from their natal families (their children’s matrilateral relatives). In Chapter 3, I reported that (a) most mothers of young children in intact first marriages indeed resided in their in-laws’ bari, but almost as many did not (43% of those whose husbands were present, and 49% of those whose husbands were absent as migrant laborers); (b) maternal grandmothers provided more childcare than would be expected on the basis of bari co-residence, and paternal grandmothers provided less; and (c) material investments in children by persons outside the immediate household came primarily from the mother’s relatives, especially her brothers. In the present Chapter, I consider how these patterns of residence and alloparenthood change after marital disruption due to death or divorce.

Comparing family types in these matters requires understanding which alloparenthal caregivers are available to a child, the kinds of care they provide, and whether it provides any benefit to the child. By availability, I refer not only to which potential alloparents are alive and within close enough proximity to provide support, but also to the pressures of social mores that differentially encourage or limit particular potential alloparenthal helpers. Bangladesh has often been described as a patrilocal society, with brides moving to their husband’s family compound at marriage, in which purdah, the seclusion of women, is normative (Amin, 1998; Bhuiya et al., 2005; Cain et al., 1979; Feldman & McCarthy, 1983; Fraser Schoen, 2015; Harris, 2001; Kenner et al., 2008; Rao, 2012). Both of these cultural circumstances would likely reduce a mother’s
access to her natal relatives (the child’s matrilateral relatives). It is possible that mothers in difficult circumstances find it even harder to recruit help from their affines, and must engage in alternative strategies to meet their children’s allopertal needs, as seems to be the case elsewhere (Perry et al., 2012).

The research questions explored here encompass availability, frequency and type of support, how allopertal parents are related to the children, and the associated child outcomes. The particular questions I examine are:

(1) **Who acts as the most frequent allopertal caregivers under different family configuration types (two-parent families, and single-parent families where parent absence is due to death, divorce or estrangement, or migrant labor)?**

(2) **Are some allopertal parents associated with better child outcomes than others?** Does who is providing allopertal care or family type affect child outcomes (growth, education, number of primary caregivers, and number of deceased siblings)?

(3) **Do allopertal care patterns occur as expected based the frequency of bari-co-residence norms, and does this change as family types are less acceptable (such as under circumstances of parent death or divorce)?**

**METHODS**

Matlab was chosen as the field site because of its patrilocal and patrilineal social structure, quality census data, and 50-year history of research with the local population. To mitigate the limitations of any single methodology, a mixed-methods approach was used, involving structured interviews, open-ended interviews, and anthropometric measures.
The International Centre for Diarrhoeal Disease Research, Bangladesh (icddr,b) has been collecting information on every household in Matlab since 1964, recording each birth, death, in-migration, out-migration, marriage, and divorce, at frequent intervals (currently every two months; icddr,b, 2015). The resultant database permits analysts to draw random samples of various types from across the jurisdiction. For the research reported here, icddr,b staff initially drew five random samples, each consisting of 100 families, representing the five family types. Selection criteria for all five samples included that there be one or more living children less than 13 years of age, and that their primary caregiver be at least 19 years old.

Two of the five family types were normative “intact families”: ones in which both parents were present in the home ("2-Parent families"), and ones in which the husband was a migrant laborer ("Migrant Labor families") outside Matlab and was therefore absent. The other three family types were ones in which the children's mother was deceased ("Mother Deceased families"), the father was deceased ("Widow families"), and the parents were divorced or estranged ("Divorce families"). Available primary caregivers from these five random samples were then approached for an interview, with as many structured interviews completed as was possible within the timeframe of the study, March through May, 2014. Interviewees were not forewarned of the researcher's visit (which would not generally have been possible), but were simply approached at their residence after the researcher had travelled to the locale provided by the icddr,b database. Only two potential respondents out of a sample of 192 people turned down the request to be interviewed, so refusals should not have biased the results. Two interviews had to be ended early and a few respondents did not answer all questions. These
incomplete interviews are included in the data presented here, and account for the occasional "unknown" responses.

All of the twelve open-ended interviews were initially conducted with the help of a local Research Assistant/Translator. These interviews elicited respondents’ experiences, expectations, and conceptions of the local norms concerning childcare and alloparenthal assistance, thus contributing to the development of the structured interview. In addition, census books in the icddr,b Matlab field office contain data recorded during visits every other month by community healthcare workers, through February 2014, and these data were combined with the structured interview data to supplement information on child residence and primary caregiver changes, and to validate birth dates and other information from the structured interviews.

One hundred and ninety respondents participated in the structured interviews, consisting of standardized questions and requiring about an hour to complete. Because some of the respondents had children in more than one family type (explained further below), there were 65 2-Parent families, 32 Widow families, 53 Migrant Labor families, 28 Divorce families and 30 Mother Deceased families, for a total of 208 family type interviews. Information was obtained on all children under the age of 13 that the respondent was responsible for, making a total of 323 dependent children in the database from the structured interviews. Questions elicited basic demographic information, family socioeconomic status, co-bari and co-household residence, who served as childcare and resource providers, and education level of the parents and children. For the analyses presented here, crucial questions included the following:

*Whose bari is this? (i.e. that in which the interviewee and children resided)*
What is your relationship to the children you are raising?

Who is their most common caregiver (other than you)?

Are there people who give your family gifts, payments for school, clothing, payments for medical expenses, etc.? Follow up questions detailed the resources provided, who provided them, and the recipients.

A series of questions elicited the interviewee's estimates (in Bangladeshi Taka per month) of household income from labor outside the home, remittances, and the sale of agricultural products, which were summed and multiplied by twelve to arrive at an estimate of annual household income. Seasonally variable income was summed for the whole year and included in the annual total. To deal with the variability in household size, adjusted household income was then computed as the estimated household income divided by the square root of the number of household residents, since household costs do not increase linearly with family size; this is a standard method for adjusting household income (e.g., Johnson et al., 2005). Bari residence was categorized as "paternal" if the bari belonged to the child’s father’s relatives, "maternal" if it belonged to the child's mother's kin, and "neolocal" if it belonged to kin of neither, or had been newly established by the couple themselves.

Finally, data were collected on child outcomes. The height and weight of each dependent child available at the time of interview were measured using a tape measure and scale (as per Reguphathy et al., 2012). Height and weight were then converted to age-and-sex-specific standard scores, according to World Health Organization norms (WHO 2015); thus, for example, a child whose weight fell 1.2 standard deviations below the world average according to the WHO would be assigned a weight score of -1.2. A final outcome measure, applicable only to children 6 years of age or older, was

81
educational attainment: the difference between the child's actual grade level and the normative grade for a child of that age if there had been no disruptions in schooling.

Interviewees representing the five family types were not always members of the original five random samples for a combination of reasons. First, it was discovered only after interviews began that the "Divorce" sample had been drawn in such a way that it was not restricted to families in which there were children of divorce, but only required that the mother had been divorced; for this reason, many cases were in fact intact families in which the mother had had an earlier, brief, childless marriage, which did not meet the intended criterion, namely that the children be the progeny of the severed marital union. Moreover, whereas mothers in the two intact family types were highly likely to be found at home, the primary caregivers in the three non-intact family types were not. Thus, if the researcher travelled to a rural bari only to discover that the targeted interviewee was not at home, she inquired whether there was another household in the bari which met the criteria for one of the three non-intact family types, and substituted that interviewee for the one that was initially targeted. This type of substitution is an accepted methodology (e.g. Fraser Schoen 2014) and is unlikely to have introduced bias, because the baris were effectively randomly selected with respect to the target family type and families within baris are apt to share family and neighborhood attributes. Finally, the family circumstances of some targeted interviewees had changed such that they either belonged to a different family type than when sampled (e.g. if the husband in a "2-Parent" family had recently departed to be a migrant laborer) or, as indicated above, they met the criteria for two groups. For example, a woman who was the stepmother to her husband's child of a former marriage might also be caring for her own child of the present union, or a
grandmother caring for her deceased daughter's infant might still have a dependent child of her own; when such women (n = 12) provided answers about both children (or sets of children) under their care, the relevant responses were then recorded separately under the two relevant family types.

RESULTS

PRIMARY CAREGIVERS

Table 1 presents the numbers of children in each family type and the relationships of their primary caregivers to them. Children of intact marriages (the Migrant Labor and 2-Parent groups) were almost invariably cared for by their mothers, as were 85% of the children of widows. (Madrasas are residential religious schools. The two Madrasa-dwelling children in the Migrant Labor group were siblings whose father taught at the Madrasa they attended, outside the Matlab area; this family considered the paternal bari their home and the Madrasa a temporary residence for schooling only).

<table>
<thead>
<tr>
<th>Relative</th>
<th>Migrant Labor</th>
<th>2-Parent</th>
<th>Widow</th>
<th>Divorced</th>
<th>Mother Deceased</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mother</td>
<td>96</td>
<td>103</td>
<td>35</td>
<td>16</td>
<td>0</td>
</tr>
<tr>
<td>Father</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Older Sister</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Maternal Grandmother</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Mother’s Sister</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Paternal Grandmother</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td>Father’s Sister</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Father’s Brother’s Wife</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Step-Mother</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>15</td>
</tr>
<tr>
<td>Madrasa</td>
<td>2</td>
<td>1</td>
<td>5</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Adopted Out</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>105</td>
<td>41</td>
<td>32</td>
<td>44</td>
</tr>
</tbody>
</table>

Chapter 5, Table 1. The frequencies at which different relatives served as a child's primary caregiver, by family type.
Among children of divorce, 50% were in the care of their mothers, and another 25% had been left with maternal grandmothers by women who had brought their children back to the natal home after divorce and subsequently remarried or moved to the city as wage laborers. The remaining 25% were living with paternal family. There was no evident tendency for custody after divorce to differ according to the child's sex or age at the time of divorce: The 24 who were in maternal family care consisted of 14 girls and 10 boys, with a mean age at divorce of 2.6 (± 2.3 S.D.) years, whereas the 8 who were in paternal family care were 5 girls and 3 boys with a mean age at divorce of 3.6 (± 2.4) years (t = 1.03, p > 0.2). Fifty percent of the children of divorce and 15% of the children of widows were being cared for by someone other than their mother, compared to 3% of the children in intact families. Both the non-intact family types differ significantly from intact families in this regard (p < .01, by Fisher Exact test).

Children whose mothers were deceased were cared for by the widest array of relatives, with stepmothers being the most common category of caregiver. In addition to the 15 children of deceased mothers and the 2 children of divorce who were in the care of stepmothers at the time of interview, several others dwelt with stepmothers temporarily after the mother's death or the parents' divorce, and moved to grandmaternal care after the stepmother produced a child of the new marriage. In two cases, respondents reported that the widowed father had married a stepmother who did not remain because of alleged mistreatment of the stepchild in her care.
ALLOPARENTAL HELPERS

Interviewees were asked to identify each child's “most common caregiver” other than the primary caregiver (hereafter referred to as the secondary caregiver). Table 2 summarizes their responses. (Paternal family cases include 11 cases in which the father himself was reported to be that secondary caregiver, 7 in the Two-Parent group and 4 in the Mother Deceased group; and maternal family cases include two in which the mother was named, one in the Two-Parent group and one in the Divorce group.) The paternal grandmother was named as the secondary caregiver 71 times and the maternal grandmother 45, but these frequencies were notably different across the family types.

For 93 of the 194 children of intact marriages with living grandmothers who were not their primary caregivers (48%), a grandmother was the secondary caregiver (60 paternal, 33 maternal), but the same was true for only 23 of the 74 such children of disrupted marriages (31%; 11 paternal, 12 maternal), which is a significantly lower percentage ($\chi^2_{1\text{df}} = 6.2, p = .01$).

<table>
<thead>
<tr>
<th></th>
<th>Migrant Labor</th>
<th>2-Parent</th>
<th>Widow</th>
<th>Divorce</th>
<th>Mother Deceased</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paternal</td>
<td>45</td>
<td>50</td>
<td>14</td>
<td>9</td>
<td>20</td>
</tr>
<tr>
<td>Maternal</td>
<td>27</td>
<td>12</td>
<td>3</td>
<td>19</td>
<td>8</td>
</tr>
<tr>
<td>Nuclear</td>
<td>20</td>
<td>25</td>
<td>17</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Non-Relative</td>
<td>5</td>
<td>13</td>
<td>3</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>No one</td>
<td>0</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>N/A or U/K</td>
<td>3</td>
<td>2</td>
<td>4</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100</strong></td>
<td><strong>105</strong></td>
<td><strong>41</strong></td>
<td><strong>32</strong></td>
<td><strong>44</strong></td>
</tr>
</tbody>
</table>

Chapter 5, Table 2. Frequency of nomination as a child's secondary caregiver, by laterality of family and family type. “Nuclear” family secondary caregivers include the child’s older siblings and those sibling’s wives.
Especially noteworthy is the fact that among the 35 children in the primary care of their widowed mothers, not one had the maternal grandmother as secondary caregiver.

This reflects the fact that widows, unlike divorcées, rarely returned to their natal family's bari (Table 3). If we compare the children of widows to those of divorcées with respect to bari residence (paternal, maternal, or neolocal), the difference is highly significant ($\chi^2 = 21.0, p < .0001$).

<table>
<thead>
<tr>
<th></th>
<th>Migrant Labor</th>
<th>2-Parent</th>
<th>Widow</th>
<th>Divorce</th>
<th>Mother Deceased</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paternal</td>
<td>47</td>
<td>51</td>
<td>20</td>
<td>8</td>
<td>23</td>
</tr>
<tr>
<td>Maternal</td>
<td>23</td>
<td>9</td>
<td>2</td>
<td>18</td>
<td>8</td>
</tr>
<tr>
<td>Neolocal</td>
<td>27</td>
<td>44</td>
<td>14</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>Madrasa</td>
<td>2</td>
<td>1</td>
<td>5</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Adopted Out</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>U/K</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100</strong></td>
<td><strong>105</strong></td>
<td><strong>41</strong></td>
<td><strong>32</strong></td>
<td><strong>44</strong></td>
</tr>
</tbody>
</table>

Chapter 5, Table 3. *Bari* residence of children by family type.

Several factors may explain why a widow and her children were relatively likely to remain in the *bari* of the deceased husband / father. One is that the interviewed widows were significantly older (mean age 41.2 years) than the divorcées (35.1 years; $p = .002$ by t-test) and relatively unlikely to have healthy, living mothers to whom they *could* return; fully 41% of widows reportedly had deceased mothers, compared to just 7% of divorcées (although it must be noted that in the divorce case, an interviewee on the paternal side did not always know whether the child's maternal grandmother was alive). Perhaps more important, according to the interviewed widows themselves, was a conviction that remaining in the late husband's *bari* not only ensured them of a place to live but also safeguarded the children's entitlements to patrilineal inheritance, even when
the widow and her children derived little or no support from the late husband's relatives, as was often the case.

MATERIAL ASSISTANCE

In addition to the child's secondary caregiver, interviewees were also asked who, other than members of the child's immediate household, provided material support such as food, clothing, and school fees or other financial assistance. Strikingly, maternal relatives were the most frequently named contributors within each of the five family types, as shown in Table 4; most of these maternal relatives were the mothers' brothers. The prevalence of maternal family assistance cannot be attributed to proximity; in fact, children more often dwelt in close proximity to the father's kin than to the mother's in all family types except for children of divorce (Table 3), and the ratio of maternal kin to paternal kin as resource providers (Table 4) exceeds the ratio of maternal over paternal bari residence (Table 3) within every one of the five family types.

<table>
<thead>
<tr>
<th></th>
<th>Migrant Labor</th>
<th>2-Parent</th>
<th>Widow</th>
<th>Divorce</th>
<th>Mother Deceased</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paternal</td>
<td>18</td>
<td>12</td>
<td>7</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>Maternal</td>
<td>70</td>
<td>68</td>
<td>28</td>
<td>21</td>
<td>17</td>
</tr>
<tr>
<td>Nuclear</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Non-relative</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>Mat/Pat tie</td>
<td>6</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>No-one</td>
<td>3</td>
<td>14</td>
<td>2</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>N/A or U/K</td>
<td>1</td>
<td>6</td>
<td>2</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100</strong></td>
<td><strong>105</strong></td>
<td><strong>41</strong></td>
<td><strong>32</strong></td>
<td><strong>44</strong></td>
</tr>
</tbody>
</table>

Chapter 5, Table 4. Frequency of nomination as a child's primary material resource provider (other than household members), by laterality of family and family type. "Nuclear" family includes the child's older siblings and those sibling's wives.
THE ATTRIBUTES, EXPERIENCES AND SITUATIONS OF CHILDREN IN NON-INTACT FAMILIES

Children of non-intact families lived in poorer homes, on average, than children of intact marriages. The mean adjusted household income of Migrant Labor families (income divided by the square root of household size; see Johnson et al. 2005) was 85K BTK, significantly higher than that of every other family type (Scheffé pairwise tests: p < .02 for Migrant Labor versus each other type). For Two-Parent families, the mean was 58K (± 54K S.D.) BTK, for Mother-Deceased 46K (± 32K) BTK, for Divorced 35K (± 26K) BTK and for Widowed 33K (± 29K) BTK, but with substantial income variability, there were no significant pairwise differences between family types other than the Migrant Labor families (p > .2 for all other contrasts). As we will see, household income has an important influence on outcome measures such as child height and weight, and must be controlled for in between-group comparisons.

At the time of interview, children of divorce were younger, on average (mean 6.7 years), than those of widows (9.4 years) or deceased mothers (8.5 years; ps < .001 by Scheffé pairwise tests), partly because children were younger at the time of parental divorce or estrangement (mean 2.8 years) than at the time of a parent's death (mean age 4.2 years in both the Widow and Mother-Deceased groups). A child of divorce was also much more likely to be an only child: 19 of 31 for whom the information was available (61%) had no full siblings, compared to just 5% of the children of widows and 19% of those with deceased mothers (p < .0001 by $\chi^2$ test). Divorce is not, in general, a fate of older women; rather, divorced women reported that it typically followed an estrangement initiated by the wife in her teens or twenties, who might leave her husband after
producing one child or none, and who had often lived only briefly in her husband’s home, if at all.

There were no significant differences in child sex ratio across the five family types, although intact families had a slight preponderance of boys (57% male), and non-intact families a slight preponderance of girls (47% male). Children of widows had 2.6 full siblings on average (S.D. = 1.6, range 0-7), those of deceased mothers had 1.4 (S.D. = 1.3, range 0-5), and children of divorce 0.8 (S.D. = 1.3, range 0-5). The inclusion of sibling sets in the data of focal interest here is relatively infrequent, however, for three reasons: siblings of focal children were often older than the inclusion criterion, were often dispersed across households, and were sometimes deceased. Thus, the 41 children of widows represent 32 independent sibling groups, the 44 children of deceased mothers represent 30, and the 32 children of divorce represent 28. Sixteen children had one or more deceased siblings, with no demonstrable differences across family types although two widows stood out by having had three and four children die, respectively, after their husbands’ deaths.

An important consequence of parental death or divorce is that children often experience change in the identity of primary caregivers, sometimes repeatedly. Table 5 portrays the numbers of primary caregivers that the children of non-intact marriages had experienced by the time of interview. (The number of moves between caregivers and between households was often greater, as it was not unusual for an interviewee to explain that a motherless child, for example, had moved back and forth between two caregivers.) Most children of widows experienced continuity of maternal care, and of residence as well, although many interviewed widows lamented an absence of needed support from
their late husbands' kin. The experiences of children in the other two disrupted family situations were very different. Children of divorce either ceased to be cared for by their mothers (Table 1) or, if they remained with their mothers, moved to a different bari with a new social milieu. Children of deceased mothers experienced the most disruption, with primary care by a grandmother or stepmother often serving as only a temporary stopgap. Each of these three groups differs significantly from the other two in the numbers of caregivers (p < .001 by Scheffé tests). Placing children with anyone other than extended family was rare, but five infants were adopted out at the death of their mothers, and a further five children whose mothers were poor widows were living in Madrasas; see Table 1.

<table>
<thead>
<tr>
<th></th>
<th>One</th>
<th>Two</th>
<th>Three</th>
<th>Four</th>
<th>Five</th>
<th>Total</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Widow</td>
<td>35</td>
<td>6</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>41</td>
<td>1.1</td>
</tr>
<tr>
<td>Divorce</td>
<td>13</td>
<td>17</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>32</td>
<td>1.7</td>
</tr>
<tr>
<td>Mother Deceased</td>
<td>0</td>
<td>9</td>
<td>27</td>
<td>5</td>
<td>1</td>
<td>42</td>
<td>3.0</td>
</tr>
<tr>
<td>Total</td>
<td>48</td>
<td>32</td>
<td>29</td>
<td>5</td>
<td>1</td>
<td>115</td>
<td></td>
</tr>
</tbody>
</table>

Chapter 5, Table 5. Frequency distribution of the number of primary caregivers that a child had experienced, by non-intact family type.

The children of Matlab are short and underweight, according to World Health Organization norms (icddr,b, 2015). Table 6 presents the mean heights and weights of children in the five family types when these measurements are converted to WHO-normed standard scores (that is, to departures, in standard deviations according to WHO distributions, from the world mean for the child’s age and sex). The WHO provides normative height distributions for children up to (and beyond) age 12, but weight distributions only up to the age of 10 years. With the exception of the Mother-Deceased group, children in non-intact families were not obviously faring worse than those in intact families. Pairwise differences among family types were not statistically significant,
however, even when household income was controlled. There were no differences between the sexes.

<table>
<thead>
<tr>
<th></th>
<th>Migrant Labor</th>
<th>2-Parent</th>
<th>Widow</th>
<th>Divorce</th>
<th>Mother Deceased</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height</td>
<td>-1.3 (59)</td>
<td>-1.3 (72)</td>
<td>-1.2 (29)</td>
<td>-1.3 (20)</td>
<td>-1.7 (18)</td>
</tr>
<tr>
<td>Weight</td>
<td>-0.9 (59)</td>
<td>-1.4 (68)</td>
<td>-1.2 (17)</td>
<td>-1.3 (21)</td>
<td>-1.9 (12)</td>
</tr>
</tbody>
</table>

Chapter 5, Table 6. Mean child height and weight, expressed as WHO-normed standard scores (see text), by family type. Numbers of measured children in each group are in parentheses.

A further outcome measure is child education: The difference between years of education completed and expected education for age was calculated for all children who were age 6 and older. Children of two-parent families were on average 1.4 years ($\pm$ 1.3 S.D.) behind in school, children of migrant labor families were 1.2 ($\pm$ 1.0), children of divorce 1.6 ($\pm$ 1.5), children of widows 1.9 ($\pm$ 1.3), and children of deceased mothers 2.8 years behind ($\pm$ 2.0). Of course, the older a child, the farther behind one can be, so in order to compare between family types, child age must be controlled. Net of the effect of age, the children of deceased mothers were significantly farther behind than all other family types except for children of divorce (ANOVA and Scheffé pairwise tests), mainly because they were exceptionally likely to be kept out of school altogether: 42% of children with deceased mothers who were age 7 and up had no education at all, far more than in any other family type (Table 7).

<table>
<thead>
<tr>
<th></th>
<th>Migrant Labor</th>
<th>2-Parent</th>
<th>Widow</th>
<th>Divorce</th>
<th>Mother Deceased</th>
</tr>
</thead>
<tbody>
<tr>
<td>No schooling</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>11</td>
</tr>
<tr>
<td>Some schooling</td>
<td>27</td>
<td>26</td>
<td>26</td>
<td>9</td>
<td>15</td>
</tr>
<tr>
<td>Total</td>
<td>28</td>
<td>28</td>
<td>28</td>
<td>10</td>
<td>26</td>
</tr>
</tbody>
</table>

Chapter 5, Table 7. Participation in education among children of school age (seven years and older), by family type.
In addition to family type, other variables that might affect outcome measures such as height, weight and educational attainment include the child's age and sex, the number of dependent children in the home, the total number of household residents, and household income. Table 8 presents the results of multiple regressions conducted to assess the simultaneous impacts of these five variables.

<table>
<thead>
<tr>
<th>Predictors:</th>
<th>Child outcome measures:</th>
<th>WHO Height</th>
<th>WHO Weight</th>
<th>Education</th>
</tr>
</thead>
<tbody>
<tr>
<td>Child age - Coefficient</td>
<td>-0.015</td>
<td>-0.083</td>
<td>-0.396</td>
<td></td>
</tr>
<tr>
<td>p value</td>
<td>.580</td>
<td>.031</td>
<td>&lt;.001</td>
<td></td>
</tr>
<tr>
<td>95% confidence interval</td>
<td>-.067, .038</td>
<td>-.158, -.008</td>
<td>-.518, -.275</td>
<td></td>
</tr>
<tr>
<td>Child sex - Coefficient (+ = male advantage)</td>
<td>.186</td>
<td>.004</td>
<td>-.049</td>
<td></td>
</tr>
<tr>
<td>p value</td>
<td>.268</td>
<td>.986</td>
<td>.826</td>
<td></td>
</tr>
<tr>
<td>95% confidence interval</td>
<td>-.144, .514</td>
<td>-.422, .429</td>
<td>-.494, .396</td>
<td></td>
</tr>
<tr>
<td># &lt; 13 years old in home - Coefficient</td>
<td>-.168</td>
<td>-.247</td>
<td>.130</td>
<td></td>
</tr>
<tr>
<td>p value</td>
<td>.100</td>
<td>.048</td>
<td>.298</td>
<td></td>
</tr>
<tr>
<td>95% confidence interval</td>
<td>-.368, .032</td>
<td>-.492, -.002</td>
<td>-.116, .377</td>
<td></td>
</tr>
<tr>
<td>Total # persons in household - Coefficient</td>
<td>.017</td>
<td>-.166</td>
<td>-.022</td>
<td></td>
</tr>
<tr>
<td>p value</td>
<td>.736</td>
<td>.015</td>
<td>.755</td>
<td></td>
</tr>
<tr>
<td>95% confidence interval</td>
<td>-.084, .119</td>
<td>-.300, -.032</td>
<td>-.161, .117</td>
<td></td>
</tr>
<tr>
<td>Adj. h'hold income. (10K BTK) - Coefficient</td>
<td>.066</td>
<td>.084</td>
<td>.047</td>
<td></td>
</tr>
<tr>
<td>p value</td>
<td>&lt;.001</td>
<td>&lt;.001</td>
<td>.053</td>
<td></td>
</tr>
<tr>
<td>95% confidence interval</td>
<td>.035, .096</td>
<td>.043, .125</td>
<td>-.001, .095</td>
<td></td>
</tr>
<tr>
<td>N of children in analysis</td>
<td>193</td>
<td>175</td>
<td>125</td>
<td></td>
</tr>
<tr>
<td>(R^2)</td>
<td>.110</td>
<td>.160</td>
<td>.301</td>
<td></td>
</tr>
<tr>
<td>p value (model)</td>
<td>&lt;.001</td>
<td>&lt;.001</td>
<td>&lt;.001</td>
<td></td>
</tr>
</tbody>
</table>

Chapter 5, Table 8. Multiple regression models predicting child height, weight and educational attainment on the basis of age, sex, and household attributes. (Bold entries are those for which 2-tailed \(p < .05\).)

As noted above, shortfalls in educational attainment were strongly affected by age, but of course the maximum possible years behind grade level increase as children age, and it is for this reason that age was controlled in comparing educational attainment across family types. More noteworthy is the fact that household income had a strong positive effect on height and weight, as well as a significant effect on educational
attainment if one adopts the directional hypothesis that its effect should be positive. A child's weight for age was the most sensitive outcome measure, exhibiting distinct negative effects of the number of dependent children and the total number of persons in the home, as well as a larger effect of household income than was seen for height. This is probably because weight can vary in the short term, such that current conditions, as compared to those experienced earlier, really do have a stronger effect on current body weight than on height or educational attainment (see, e.g., Brown et al, 1982).

**MAINTENANCE OF CONTACT WITH THE CHILD'S MATERNAL AND PATERNAL RELATIVES**

When marriages are disrupted by death or divorce, children may lose contact with relatives. In the present study, the maintenance of contact with grandparents, aunts and uncles was assessed by asking the child's primary caregiver how often she or he visited each such relative of the child who dwelt elsewhere than in the same bari. (Most women do considerable work in the bari yard, where other residents also gather and work; contact in this situation may not be avoidable and was not considered "visiting"). For purposes of analysis, contact with maternal (or paternal) relatives was considered to be ongoing if such a relative (other than the primary caregiver) co-resided with the child in the same household or bari, had been visited by the interviewed primary caregiver within the past year, or was named as either the most common secondary caregiver or the primary provider of material resources. Table 9 presents the resultant frequencies of maintenance or loss of contact with maternal or paternal family.
Chapter 5, Table 9. Maintenance of contact with maternal and paternal relatives in non-intact families. Table entries are numbers of children.

<table>
<thead>
<tr>
<th>maintained contact with relatives on both sides</th>
<th>Widow</th>
<th>Divorce</th>
<th>Mother Deceased</th>
</tr>
</thead>
<tbody>
<tr>
<td>... with maternal relatives only</td>
<td>32</td>
<td>11</td>
<td>15</td>
</tr>
<tr>
<td>... with paternal relatives only</td>
<td>8</td>
<td>17</td>
<td>8</td>
</tr>
<tr>
<td>... with relatives on neither side</td>
<td>1</td>
<td>4</td>
<td>13</td>
</tr>
<tr>
<td>Unknown</td>
<td>0</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>Total</td>
<td>41</td>
<td>32</td>
<td>44</td>
</tr>
</tbody>
</table>

Since widows tended to remain in their marital homes, often in the paternal *bari*, while deriving material assistance from their natal kin, especially their brothers, it is unsurprising that the children of widows usually maintained contact with relatives of both of their parents; even those living neolocally usually maintained contact with both maternal and paternal kin. By contrast, almost two thirds of the children of divorce and of deceased mothers lost contact with kin on one side. Eight of the 32 children of divorce dwelt in the paternal *bari* and maintained contact with paternal relatives, but paternal family contact had ceased for 12 of the 18 living in the maternal *bari* and for 5 of the 6 living neolocally. Results for children of deceased mothers were similar to those for children of divorce, except that neolocal residence predicted maintenance of contact with both sides.

DISCUSSION

There is a history in anthropology of typologizing entire cultures (Murdock & Wilson, 1972), but there is also a parallel history of efforts to describe and understand the variation within cultures (Fortes, 1969). The research presented here targets understanding subsets of the rural Bangladeshi population and how their families interact to meet the needs of children. The research has shown that the typological ethnographic
description of Bangladesh as a patrilocal society is statistically sound to some degree: a little over half of Two-Parent, Migrant Labor, Widow, and Mother Deceased families resided patrilocally. This is far less, however, than many ethnographic descriptions imply, nor could one infer from published accounts that children of divorce primarily reside matrilocally or neilocally.

In some research based on European parish records and other such sources, whether a grandmother co-resides or is even living has been treated as a proxy for who provides alloparental care (Clarke & Low, 2001; Lahdenperä et al., 2004; Voland & Beise, 2005). It is not unreasonable to assume that co-residing relatives will be major providers of secondary child care, but in the interview data reported here, patrilocal bari-co-residence proved not to be a sure indicator of secondary child care from patrilocal relatives, especially in the case of widowed mothers who often remained in the family compounds of their late husbands but described themselves as socially isolated there. Despite having the highest proportion of patrilocal bari residence of any family type, widows derived little secondary childcare from their children’s patrilineal relatives, and relied more than any other group on nuclear family (i.e. on the dependent children's older siblings or those older siblings’ wives). In open-ended interviews, widows explained that they remained in the patrilocal bari to have a place to live and to increase the likelihood that their sons would retain their patrilineal rights (and thus be able to support them in their old age). One widow, for example, reported that she stayed for the sake of her son, but that her husband’s relatives would only give her small portions of rice if she cleaned all their houses. The only secondary childcare she received occurred each weekend when she visited her mother and brother. Her natal family also provided her with all the
clothing, household supplies, fish and vegetables she needed for the week. Her own mother had taken over the permanent care of her eldest daughter, and her brother paid for her son’s schooling. The data (Tables 2 to 4) suggest that this case was not exceptional.

It is striking that widows and their children derived secondary child care mainly from the children’s older siblings or their wives and material resource assistance mainly from matrilateral relatives, despite typological claims that these things are culturally held to be the responsibility of the patrilineage (Cain et al., 1979; Hossain, 2003).

Material support does not require proximity, and is therefore far less constrained by bari residence than is direct care-giving. Across the five family types, whether intact or disrupted, material support was mostly provided by matrilateral relatives, particularly mother’s brother. Despite the cultural expectation that the husband’s family should provide for a woman and her children beginning at marriage, and some prior evidence that this indeed occurs (Cain et al., 1979; Feldman & McCarthy, 1983; Hossain, 2003), this was often not the case in this study. It has been reported that there is an especially close emotional relationship between a woman and her brother, and between a maternal uncle and his nieces and nephews (Kenner et al., 2008), but there may be another reason why a woman’s family, particularly her brother, may provide material support to her. Based on inheritance laws in Bangladesh, “…a female in a class of heirs will typically receive one half of the share of a male in the same class of heirs” (Scalise, 2009, pp. 70) when her father dies. Most women do not request or receive this inheritance, but leave the property with their brothers, with the hope that brothers will help when they are in need (Cain et al., 1979; Scalise 2009). My interviewees explained women’s decisions in
similar terms, and widows remained in the patrilocal *bari* and received most of their material support from natal family, which would be in keeping with this rationale.

The situation for divorced women and their children was quite different from the other family types in respect to *bari*-co-residence, among other things. The Divorce group had the highest proportion of matrilocal residence, as women frequently returned to their natal *baris* with their children. Moreover, even children who remained with their fathers often lived neolocally, rather than patrilocally, making patrilocality less likely in situations of divorce than in any other family type. If mothers took their children with them when their marriages ended, they were at the mercy of the natal family to take them in, although their families were not required to do so (Bangladesh Laws, 2016; Hossain, 2003). Divorce is not only highly shameful, but also precludes women (and often their children) from any inheritance or support from the husband’s patriline (Cain et al., 1979; Hossain, 2003). Children of divorce have little access to their patrilateral family because they are unlikely to co-reside in the patrilocal *bari*, and they also receive less support from patrilateral relatives, as seen by the low frequency at which paternal kin are nominated as the main providers of secondary child care or material support. Because children of divorced women are often only-children and relatively young, their mothers have to rely on their natal families or non-relatives for support. Divorced men who retained their children relied on new wives (stepmothers), non-relative friends, or patrilateral relatives for childcare. In the Divorce group, matrilateral family came forward much more often than patrilateral family to provide primary and secondary child care, as well as material support. Most of the children of divorce in this study returned with the mother to their matrilateral *bari* after their parents separated. Once there, a
frequent expectation was that the mother would remarry and leave her child with the maternal grandmother to be raised. If the mother could not remarry or the family could not afford to care for her and her child, she might leave to work as a garment worker in Dhaka or Chittagong and send money back to the family to help support her child. This was a shameful option for these women, which they tried to avoid, as it made it difficult for them to engage in traditional purdah (Feldman & McCarthy, 1983; Rao, 2012).

Remarriage or migrant labor was the case in all of the divorce situations where children were living matrilocaly and their mothers were not the primary caregiver of their child.

Children of deceased mothers had the most varied experience with respect to residence, primary and secondary caregivers, and resource providers. Young infants whose mothers died were apt to be adopted out; these were the only adoptions in the present data set (although census records for families that were not interviewed included rare cases in which a poor widow or divorcée gave up a child for adoption). About a third of the children of deceased mothers were in the care of stepmothers at the time of interview (Table 1), but there was evidence that these step-relationships were often temporary. It was not uncommon to hear that after divorce a father would retain care of his child, and then quickly remarry resulting in a stepmother becoming the primary caregiver of the child. However, soon after the stepmother had her own child, it was not unusual for the child whose mother had died to out-migrate or move to the primary care of a grandmother (depending on the child’s age). A third of children with deceased mothers were in the care of grandmothers, some paternal, some maternal. Even when maternal kin were not the primary or secondary caregivers for these children, they were still the leading providers of material support, implying that despite the mother’s death, a
committed relationship with her children was often maintained. In sum, the data suggest that the typological characterization of Bangladeshi society as patrilineal and patrilocal has obscured the extent to which bi-lateral family connections support children’s survival and well-being.

Child outcome data from the present study are too few to establish clear effects of marital disruption, much less of the various remedies that families adopt to deal with it, but there are indications that further study of this issue is warranted. Household income was a strong predictor of children's height and weight and apparently affected educational attainment as well. The children of deceased mothers stood out as especially short, under-weight, and educationally deprived, and this may not be due to low income alone. These children were often cared for by stepmothers (Table 1), which is a risk factor for child neglect and maltreatment in many societies (Daly & Wilson, 1985) and is certainly seen as such in Matlab, where interviewees consistently stated that stepparents are apt to discriminate against and abuse their stepchildren. Two stepmothers had been expelled from Mother Deceased homes for maltreatment of the children of their husband’s first wife, and a widower who was his daughter's primary caregiver declared that he would not remarry because he would not expose his daughter to a stepmother. (After his own mother's death, he had been raised by a stepmother who reportedly abused and under-fed him and his full siblings, but not her own children.) Interviewees also claimed that stepfathers are a risk to children, and that women therefore left their children with their own mothers if they remarried, although it is also likely that remarriage is rarely an option for a woman who insists on keeping dependent children with her.
Having a mother as primary caregiver has been found to be the most beneficial circumstance for child survival (Hrdy, 2009; Konner, 2010; Strassmann, 2011), but the differential survival in these studies is largely due to infant deaths and deprivation of breast-feeding (Mwangome et al., 2012; Ronsmans et al., 2010; Roy, 2000). Elevated child mortality and morbidity after the mother's death have also been noted in weaned children, but these effects are much smaller (Ronsmans et al. 2010). What the present data suggest, and what needs further investigation, is the possibility that children of deceased mothers suffer from reduced care more generally, as their residential and caregiving situations are precarious and unstable (Table 5). Repeated changes of primary caregiver may be analogous to placement instability in foster placements in developed countries, in which such instability has been associated with negative child outcomes ranging from poorer long- and short-term mental and physical health, through elevated rates of homelessness and involvement in the criminal justice system, to poorer relationships in adulthood, poorer educational attainment and greater unemployment (Perry et al., 2014; Rubin et al., 2007; Ryan & Testa, 2005).

Social norms about marital status may have important effects on who comes forward to provide alloparental care and how effective that care is. Within a cultural community, different marital situations are not considered equally appropriate or respectable. Research on effects of family structure on children has been ongoing for decades in the developed West, especially in the U.S.A. This literature tends to show that children with an absent parent due to death or divorce do not fare as well as children in stable two-parent families, although the effect sizes are typically small and for children of divorce these negative outcomes (educational, mental health and behavioural) were
largely present prior to the divorce and related to the degree of family conflict and impairment at that time (Amato & Anthony, 2014; Amato & Keith, 1991; Cherlin et al., 1991; Kelly, 2000; Phillips, 2014). The social stigma of a parent death (by suicide or HIV) or divorce may inject additional hardship into these situations which increase the likelihood that children will have more negative outcomes after the event (Amato & Anthony, 2014; Cerel et al., 2000). More resilient children with fewer or no negative effects from divorce or parent death were those who were exposed to better family functioning prior to the event and had more social and material supports available to them after the event (Amato & Anthony, 2014; Hope & Hodge, 2016; Howell et al., 2016).

To what extent these generalizations would apply in Bangladesh is unknown. Parents who are married and co-residing are the normative family type, but father absence due to migrant labor evokes no negative reaction (Bhuiya et al., 2005; Rahman, 1997), and may even be a culturally acceptable aspiration because of its association with higher family income (Shenk et al. 2013). Having a parent absent due to death or divorce, however, is unlikely to be looked upon in a positive light. Negative attitudes can result in outright hostility toward a widow, widower or divorcée who is seen as a burden on extended family (Lewis, 1993). Indeed, in a website devoted to Bangladeshi law, it was explicit that divorce was the most “detestable” of allowable situations (Bangladesh Laws, 2016), and the respondents in the open-ended interviews completed for this study concurred, although several suggested that widows are often viewed as blameworthy, too. Divorce is not likely to occur after trivial conflicts, and whether the level of conflict prior to divorce, as well as after it, predicts negative child outcomes in Bangladesh as it does in the U.S.A. warrants investigation.
Men who are divorced or whose wives have died may also be stigmatized, but to a lesser degree than women (Amin, 1998), and this seems to be related to beliefs about gender equality in Bangladesh (Amin, 1998; Feldman & McCarthy, 1983) as well as to men’s ability to maintain their wage earning role and avoid becoming financial burdens to family; this has not typically been an option for rural women before or after the marital dissolution (Lewis, 1993). The negative cultural attitudes toward widows, widowers and divorcées may result in fewer or different alloparental caregivers coming forward compared to more socially acceptable family types in Bangladesh. Simply put, family type may be associated with who is willing to invest in a child, and as the family type is more problematic only the most committed alloparents come forward. This study found that matrilateral and nuclear families were more frequent secondary caregivers and material investors than their proximity would suggest.

Whether the common primary and secondary caregivers and material investors in non-intact families alleviate negative outcomes for children requires further investigation. In Indonesia, grandparents have been shown to target their neediest descendants, thereby improving grandchild health outcomes (Snopkowski & Sear, 2015). It may be that the involvement of matrilateral relatives in non-intact families buffers the potential negative effects of these family types, or that families without sufficient alloparental support disproportionately leave the area and are therefore underrepresented in my sample. Perhaps those who don’t have maternal grandmothers or mother’s brothers when other supports are low are more likely to try their fates in places like Dhaka or Chittagong. Further research would be required to assess these possibilities.
In view of the prevailing negative attitudes toward divorced and widowed women, it is somewhat surprising that their children were not obviously faring worse than the children of intact families. This may be attributable, in part, to the stipulation that all interviewees were currently caring for a dependent child. Other evidence indicates that children of divorce do incur elevated mortality (Alam et al., 2001; Bhuiya et al. 2005), and since children of disrupted marriages are also relatively likely to disperse, the interviewed divorce group may have been skewed toward better family situations where children have survived and are residing with family. Insofar as children of disrupted marriages really are faring no worse than others, however, this could be a result of several developments and associated cultural changes in Bangladesh over the past 40 years. These changes have increased opportunities for poor and landless families through greater access to income through wage and migrant labor (even for some women), integration of less restrictive interpretations of purdah by some women, increased education for girls, reduced child and maternal mortality, increased life spans, and lower completed fertility, to name a few (Blunch et al., 2014; icddr,b, 2015). All of these changes may have resulted in extended family being able to provide more alloparental care and material investment than they could in the past, thereby improving child outcomes in non-intact families. Further research could help elucidate the power of these potential mechanisms to buffer children from negative outcomes.

The findings reported here are relevant for both child welfare and development groups and suggest the potential utility of the following:
(1) Directing support to children of the poorest families, with deceased mothers, and those with absent, impoverished, or uncommitted extended family will likely target the most vulnerable children.

(2) Determining what extended family supports are being provided is essential to targeting the neediest children, because, as this study shows, close proximity to relatives does not necessarily mean they are providing help.

(3) Supporting safe, non-stigmatized opportunities for mothers to engage in paid labor should be supported, especially when extended family are able to provide child care but not material support.

(4) Understanding the relevance of inheritance to widows’ decisions about where to live is essential. Widows seem to be trading off living in less supportive (and sometimes hostile) environments against the maintenance of their children’s inheritance and long-term housing prospects. Because there seems to be a risk of greater discrimination against widows and their children in patrilocal baris, children of widows are at risk of being exposed to greater ongoing conflict. This is worrisome because familial conflict has been associated with negative outcomes for children in the West. One way to avoid this could be to provide better maintenance of the widow’s and her children’s inheritance rights so that they aren’t as beholden to residing with the patrilateral family. This could enable widows to have more flexible living arrangements and gain access to matrilateral family, who generally seem to be more willing to support them.

(5) Across all the five family types, children were, on average, underweight, short and behind in school for their age and sex. This speaks to the generalized
need for ongoing intervention to promote basic development in Matlab. The icddr,b has been the foundation of significant improvements in child and maternal health, specifically, but also reductions in community morbidity and mortality generally. Ongoing support for these types of programs, and support for new programs that target interventions into extended family networks, could result in important gains for the children of Matlab.
In this dissertation, I have focused on the differential investment of maternal and paternal kin, the degree of relatedness between alloparent and child, and the associated outcomes for children. I have investigated these issues across two field sites and have presented and interpreted the data in four articles. The first article has been published in a peer reviewed journal (Children and Youth Services Review) and the second has been accepted and is in press at Current Anthropology. The remaining two articles are currently under review in two other peer reviewed journals. I reviewed the theoretical foundations of my research in Chapter 1 of this dissertation, and will now briefly review my findings in light of the evolution-minded framework outlined there. I will also briefly consider the importance of my findings for furthering understanding of alloparental care and for their potential applied relevance.

CHAPTER 2: MATERNAL FOSTER FAMILIES PROVIDE MORE STABLE PLACEMENTS THAN PATERNAL FAMILIES

The research reported here utilized a database that I created, containing information on all children who were in out-of-family placements under the auspices of a child protection agency in Canada in 2008-2010. Analysis focused on the 313 placements with genealogical relatives. The duration of a placement and the reason for its ending were used as the outcome measures. Relatives providing care were overwhelmingly close kin: 90% of the placements were with relatives of degree $r = .25$. Most of these were with grandparents (68% of the total), and most of the remainder were with the children's aunts or uncles (21% of the total). Maternal grandmothers with no
partners provided 19% of all placements. Maternal kin outnumbered their paternal counterparts by about 2 to 1 overall, and although maternal kin provided care under more difficult circumstances (unemployment, low income, physical and mental health diagnoses), placements with them lasted longer (generally considered a "good" short-term outcome) than those with paternal family, when potential confounds (child age and sex, reason for placement, whether the caregiver was a grandparent, and whether the caregiver had a partner) were controlled. Moreover, placements with maternal kin were likelier to end for "good" reasons (either reuniting the child with birth parents or permanent adoption) and paternal kin placements for "bad" reasons (placement "breakdown").

These findings are readily interpreted as evidence for evolved preferences for providing costly help to closer kin and to more certain (matrilineal) kin, but they could be due to the cultural dynamics of the modern Western environment, and to child protection system practice. Child protection interventions typically involve the child’s mother, who is closer to her own family than to the father’s, leading to the over-representation of matrilateral family as kin caregivers (North American Council on Adoptable Children, 2005; Scourfield, 2006). There must be known harms or risks of harm to a child for child protection services to be involved, and these conditions are often associated with various sorts of family conflict, including tensions between the maternal and paternal families (Ahrons, 2007). Moreover, the children in care often come from homes in which fathers are absent, or are unwilling or unable to be involved due to marital conflict, addiction, mental health problems, incarceration or probation restrictions, and so forth (Scourfield, 2006), all of which reinforce the tendency for the father’s family to be less well known to or engaged with the child protective system than the mother’s family.
These considerations preclude interpretation of the numbers of kin caregivers as a direct reflection of differential willingness. However, the patterning of maternal versus paternal kin involvement is more difficult to explain away. Maternal grandparents only slightly outnumbered their paternal counterparts among intact caregiving grandparental couples, but the maternal side substantially outnumbered the paternal side among grandparent-plus-step grandparent couples, and the difference was very large among single grandparents, who presumably have the least social support. An obvious interpretation is that as providing care becomes more onerous, the willingness of paternal kin to do so falls away more steeply than the willingness of maternal kin (Gaulin et al., 1997). Moreover, the shorter duration of placements with paternal kin, and their higher frequency of breakdown prior to positive resolution of the child's long term placement needs, also speak to the relative durability of maternal kin commitment in the face of costs (as addressed in the multivariate analyses controlling for likely confounds). The child protection data thus seem to support patterns of alloparental caregiving that one might expect on the basis of evolutionary theories of Hamiltonian nepotism (kin selection), paternity (un)certainty, and the special status of grandmothers as alloparents.

CHAPTER 3: ALLOPARENTAL CARE AND ASSISTANCE IN A NORMATIVELY PATRILOCAL SOCIETY

The patterns that I reported in Chapter 2 are in accord with other studies suggesting a matrilateral bias in children's contacts in developed, predominantly neolocal, societies. But what effect might patrilocal culture have on alloparental caregiving? This question motivated the research reported in Chapters 3 through 5, based on fieldwork in
rural Bangladesh in which I interviewed various samples of the primary caregivers of children under 13 years of age.

Chapter 3 focuses on intact marriages, the normative family configuration, in which I found that despite patrilocal norms, scarcely more than half the families actually resided patrilocally, many dwelt neolocally, and if the father was an absent migrant laborer, 22% dwelt matrilocally. Although the identity of a child's secondary caregiver (primary provider of direct alloparental care) was largely determined by residential proximity, matrilateral relatives outnumbered their patrilateral counterparts as primary resource providers by 58 to 10 and maternal uncles outnumbered paternal uncles by 28 to 9. Patrilocality was associated with the children having shorter stature and being more underweight than those living matrilocally or neolocally. Living matrilocally and/or having a maternal grandmother as the secondary caregiver was associated with significantly higher educational attainment. In sum, matrilateral kin were more involved in helping intact families than many ethnographic reports seemed to imply, and I found some evidence that their involvement may be associated with better outcomes for children.

My results could reflect recent changes in social practices. Over the past 40 to 60 years, rural Bangladesh has experienced a dramatic demographic transition and a move from agriculture-based subsistence to wage and migrant labor (icddr,b, 2015; Rahman, 2010; Shenk et al., 2013). These changes have affected family structure, reducing the importance of joint families as economic units and altering the practice of *purdah* (Feldman & McCarthy, 1983; Rao, 2012). It is likely that these social changes have affected family structure, the role of women, and patterns of family support, including
increased demands on girls and women to be more involved in supporting their natal families (Fraser Schoen, 2014; Rao, 2012). Nevertheless, the involvement of matrilateral family apparently has a long history, as indicated, for example, by women’s return to their natal homes to give birth. Some disparity between ideology and behavior may be due to the recency of change, but it may also be indicative of an idealized patrilineal and patrilocal ideology that never fully matched social practice, as women remained connected to their natal families and received important support from them. As with the results of Chapter 2, the reports from the respondents in this research are again consistent with patterns that might be expected on the basis of theories of kin selection, paternity uncertainty, and grandmotherhood.

CHAPTER 4: GOING HOME: HOW MOTHERS MAINTAIN NATAL FAMILY TIES IN A PATRILOCAL SOCIETY

Visiting is sometimes interpreted as a reflection of efforts to maintain supportive relationships (Essock-Vitale & McGuire, 1985; Lawton et al., 1994; Pollet et al., 2008; Tanskanen & Danielsbacka, 2012). Prior research (typically in the modern West) has often found that families visit with matrilateral relatives more frequently than with patrilateral relatives, despite greater travel distance (Smith, 1988; Uhlenberg & Hammill, 1998; Pollet et al., 2006, 2013; Euler & Michalski, 2008). Would the constraints of patrilocality and purdah result in a different pattern in Bangladesh, or would the predominance of visiting matrilateral relatives prevail here too? According to this Chapter’s analyses of mothers’ reports of their visiting behavior outside the residential bari, the answer is that a matrilateral bias still prevails. A preference for visiting the children’s matrilateral relatives was found in analyses controlling for proximity, fathers’
and uncles’ migrant labor status, and the respondent’s age, post-marital residence, family income, and marital status. This emphasis on visiting matrilateral relatives is in keeping with the high incidence of matrilateral alloparental assistance reported in Chapter 3.

To what extent the visiting patterns reported here reflect something novel is again unknown. Social change in Bangladesh, due to the demographic transition and the increasing importance of the market economy and wage labor, may be creating situations in which women are increasingly required to provide support to both their affinal and their natal families (Fraser Schoen, 2014; Rao, 2012). The reported visiting patterns could be an indication that women are striving to maintain contact with family that will help them, and that their natal families also want to maintain contact for reciprocal support over the long-term. Elder care and financial support for landless or otherwise poor families may be better provided by a daughter who has married up than by a poor, absent, or (given the current low birth rate) non-existent son (Fraser Schoen, 2014; Rao, 2012).

Like the findings of Chapters 2 and 3, the current finding that mothers visit their natal families more than they visit the corresponding in-laws, even when the former live farther away, is in keeping with expectations based on the evolutionary theories noted above, but can hardly be considered strong evidence of the relevance of those theories for explaining women’s preferences and actions.
CHAPTER 5: WHO INVESTS IN CHILDREN IN NON-INTACT FAMILIES IN RURAL BANGLADESH?

The fourth and final empirical chapter focused on alloparental caregiving in non-intact families in rural Bangladesh after parental death or divorce, comparing the findings to those from intact families in which the father was present or was absent as a migrant laborer. Family types differed with respect to where children resided, who served as their primary and secondary caregivers, and who provided material support, but the mother’s kin played a major role in all family types, especially as material resource providers.

Household income was a consistent predictor of child height and weight, which were not demonstrably associated with family type when income was controlled. The surviving children of deceased mothers moved between successive caregivers especially frequently, and were uniquely likely to have no schooling. In intact marriages and mother-deceased families, paternal relatives were the most frequent secondary caregivers, whereas for children of divorce, maternal relatives were the most common secondary caregivers, and widows’ children were cared for most frequently by nuclear family (their older siblings or older brothers’ wives) even though they resided almost exclusively in the late father’s family’s bari). Maternal relatives were most often named as the primary material resource providers in all five family types. Children with deceased mothers were significantly more likely to have no schooling than the other family types; they were also the group that was most underweight and short (compared to WHO reference standards), but high variability precluded statistical significance. They were also the children who were most likely to have lost contact with one or both sides of the natal family.
The primary importance of mothers in children’s welfare has been well documented outside of Bangladesh and within it (Roy et al., 2000; Hrdy, 2009; Konner, 2010; Ronsman et al., 2010; Mwangome et al., 2012; icddr,b, 2015). This may be one reason that children with deceased mothers do poorly, compared to other family types. These children were often cared for by stepmothers who may discriminate against them (Daly & Wilson, 1998a), which is something that my respondents considered typical and expectable. Moreover, the multiple changes in primary caregivers of children whose mothers have died may have negative impacts similar to those associated with multiple placement changes in child protection settings in the West (Chamberlain et al., 2006; Jones Harden, 2004; Jonson-Reid & Barth, 2000).

Shame may also play a role in the resources available to families. Widows report experiencing social isolation, and resort to nuclear family for care because patrilateral family are less likely to provide support than when their husbands were alive. Indeed, many divorced women reported that patrilateral family revoked all support, and they returned to their natal families with their children if they could. Women often leave their children of divorce with their own mothers and remarry, perhaps escaping the twin stigma of being unmarried and divorced. The importance of shame and its effects on who provides alloparental care can be interpreted in terms of immediate cultural expectations, but also as a consequence of the potentially underlying psychological mechanisms derived from kin selection, paternity uncertainty, and the importance of grandmothers.
INTERPRETATION AND IMPLICATIONS

The consistency of support for the importance of close relatedness, familial laterality, and grandmothers across my results in two distinctly different cultural environments (neolocal modern Canada and patrilocal developing Bangladesh) gives credence to the importance of these factors in alloparental caregiving and resource provisioning more generally. This is in keeping with a growing literature demonstrating similar patterns cross-culturally (Borgerhoff Mulder, 2007; Sear & Mace, 2008; Scelza & Bliege Bird, 2008; Scelza, 2011; Hawkes & Coxworth, 2013). As more anthropologists test the importance of relatedness, familial laterality and grandmother support in developing nations across different family structures, it will become possible to assess to what extent these patterns may be "human universals".

What are the implications for families who are not able to meet the needs of their children on their own? Based on what has been presented here, (1) families may need direction in how to negotiate obtaining support from the closest relatives available, particularly maternal grandmothers. Those mothers who have poor relationships with their natal families may need help in working through these issues to promote the best support for their children. (2) If this maternal family support is not an option, efforts to connect with family who do not have significant competing demands for their limited resources where all caregivers are committed to the child are needed. There is a caution: although this seems to be in keeping with “Family Finding” programs (North American Council on Adoptable Children, 2005; Campbell, 2016), what is suggested here is more specific. Whereas Family Finding often takes a broad view of “kin” that goes beyond any genealogical or affinal relationship to include people who have a cultural connection
to a child’s parents, and fails to distinguish among prospective alloparental supports based on degree of relatedness, familial laterality and whether they are a grandparent, I see these as important areas to explore in the assessment process. (3) Determining the competing demands on prospective caregiver, especially those made by more closely related dependent people, is also essential. Adopting these three principles could reduce disruption in the lives of the focal child and potential alloparental caregivers, and reduce the costs incurred in locating and recruiting caregivers. Taking into consideration evidence garnered from research with evolution-minded theoretical bases is relevant in applied settings.

In Bangladesh, I found that close kin and matrilateral kin provide more material support to children than do patrilateral relatives, and given differential accessibility, they are apparently more willing providers of direct alloparental care as well. This predominant role of the child’s maternal relatives is especially evident in the difficult circumstances of non-normative family types. Some simple recommendations for consideration in policy development in Bangladesh follow:

(1) Directing support to children of the poorest families, with deceased mothers, and those with absent, impoverished, or uncommitted extended family will likely target the most vulnerable children.

(2) Determining what extended family supports are being provided is essential for targeting the neediest children, because, as this study shows, close proximity to relatives does not necessarily mean that they are actually providing help, and stated norms concerning obligations to provide help do not ensure actual help or clearly predict who will and will not be recipients.
(3) Safe and non-discriminatory opportunities for mothers to engage in paid labor should be supported, especially when extended family are able to provide child care but not material support.

(4) Understanding the importance of inheritance for widows in their decision making about residence location is essential. Widows seem to be trading off living in less supportive (and sometimes hostile) environments against the maintenance of their children’s inheritance and long-term housing. Because there seems to be a risk of greater discrimination against widows and their children in patrilocal *baris*, children of widows are at risk of being exposed to greater ongoing conflict. This is worrisome because family conflict has been associated with negative outcomes for children in the West. One way to avoid this could be to provide better maintenance of the widow’s and her children’s inheritance rights so that they aren’t as beholden to residing with the patrilateral family. This could enable widows to have more flexible living arrangements and gain access to matrilateral family, who generally seem to be more willing to support them if they have sufficient resources.

Are relatedness, laterality, and the exceptional role of grandmothers all there is to alloparental care? Of course not. Issues of mating effort (Pashos et al., 2016), cooperation dynamics (Kasper & Borgerhoff Mulder, 2015), and subsistence (King & Elder, 1995) are relevant and need to be taken into consideration. These factors are not alternatives to the relevance of relatedness, laterality, and grandmotherhood, but additional factors that require consideration. As Bangladesh moves further toward a market and wage-based economy and the population engaged in subsistence agriculture
further declines, cultural patterns of patrilocality, patrilineal inheritance and the restrictive nature of *purdah* may give way to a greater incorporation of women into the full range of economic roles, and bilateral family engagement may be more widely recognized as normal and normative, opening the door to improved availability of alloparental care of children. Policies that support such trends might improve the situation for families at a faster rate than the current situation.
REFERENCES


the investment of aunts and uncles: a consequence and measure of paternity uncertainty. *Human Nature*, 8, 139-151.


Pollet, T. V., Roberts, S. G. B., & Dunbar, R. I. M. (2013). Going that extra mile: individuals travel further to maintain face-to-face contact with highly related kin than with less related kin. *PLOSone, 8*, e53929.


VITA

Gretchen Perry was born in Masterton, New Zealand and moved to Southern Ontario, Canada, in 1972 where she spent the majority of her childhood with short residences in Bay Vert, Newfoundland, Canada, and Devonport, New Zealand. After completing high school in Dundas, Ontario, she attended the University of Guelph where she completed an Honours B.A. in Psychology, with a minor in Child and Family Studies, and graduated on the Dean’s List for academic achievement in 1992.

Gretchen began her 23 year career in social services while completing her B.A., and worked in services for the developmentally disabled, for children with severe physical disabilities, and for persons with serious mental health issues, as well as in child protection services. Gretchen was engaged in teaching as an aspect of all of her positions in social services, and worked as frontline staff providing direct service to families and participants, as well as supervisory positions in developmental services and child protection. The primary aspects of her work involved providing supports to vulnerable children, adults and families to enable them to manage the challenges that they faced with greater independence, safety and well-being. This meant developing skills working with people with developmental disabilities, addictions, mental health challenges, issues of conflict in their lives, and involvement with the justice system. Developing skills in direct clinical work (particularly family assessments), as well as the effects of policy and community development, were always central to her work.

In 2010, Gretchen graduated with her Masters of Social Work from Flinders University, Australia. Her primary thesis was based on her work with families in child
protection and determining factors that would promote better outcomes for children in care, particularly those placed with extended family. She began her Ph.D. in anthropology at the University of Missouri in 2012, with support from a G.E. Huggins Fellowship. Her doctoral dissertation has involved two field sites, the first being the child protection setting of Waterloo Region, Canada, where she developed a database of all out of home placements in a three year period and analyzed the relationship of the focal child to the caregiving family and placement stability. The second field site, visited in 2014, was Matlab, Bangladesh. There she completed open-ended and structured survey interviews with respondents to determine who provided direct alloparental care and material support to children and the related outcomes, across five family configurations. The primary questions addressed in both projects concerned the relatedness and family laterality of alloparents and the involvement of grandmothers in the care of children, as well as child outcomes. Ultimately, Gretchen was investigating child development and well-being, family structure and alloparental caregiving patterns in divergent cultural environments and within the context of high family needs and a developing nation. The research in Waterloo Region was supported by funding from the Ontario Ministry of Child and Youth Services, and the research in Matlab was supported by a Research Experience for Graduate Students award from the National Science Foundation, U.S.A.

Gretchen has presented her research at the Human Behavior and Evolution Society (HBES) annual conference on three occasions, as well as the American Anthropological Association, the inaugural Brazilian HBES conference, the Darwin Day Conference in Canada, the Conflict and Cooperation in the Family Conference in
Australia, and at a Kin Caregiver Conference for child protection workers in Ontario, Canada. She has also given talks and training sessions at Family and Children’s Services of Waterloo Region, and has taught General Anthropology at the undergraduate level.

Gretchen currently resides in Dundas, Ontario, with her husband, Martin Daly, where she is developing further research projects, proposals and a Webinar presentation for Practice and Research Together.