Families and Disaster Behavior: 
A Reassessment of Family Preparedness

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Disaster researchers have consistently emphasized that the family is a principal conduit for disaster behaviors and critical for its individual members’ survival. Evidence for this claim, however, is problematic as it is based primarily on anecdotal and ethnographic evidence restricted to ongoing or post-disaster coping behaviors. Such evidence should focus on the preparedness stage where family disaster behavior is critical for subsequent chances of survival. Reassessing the primacy of the family-disaster link at the preparedness stage was accomplished by analyzing a representative Israeli sample (n=814) of family household units. Focusing on the household unit provided access to its members, internal familial social processes and household pre-disaster preparedness levels. The households were divided into traditional, cohabiting and single family structures. The initial analysis showed that variations in household structure had inconsistent and in some cases no impact on core disaster preparedness behaviors. Testing a series of alternative explanations related to internal familial social processes found that the extent and intensity of family social networks and gender of the household head did predict differences in preparedness levels. Apparently, the impact of families on preparedness—a vital factor in subsequent disaster behaviors—does not appear to be the result of its structure but the social processes inherent within the household. Being a family in its many diverse forms but lacking these essential familial ingredients is no guarantee of being prepared for disasters.

Introduction

The family has long been considered a fundamental unit in the study of disaster behavior (Drabek, 1986; Trost & Hultaker, 1983). Supporting this belief is the historic continuity of institutionally embedded family disaster behaviors that have evolved and adapted
themselves to both natural and human-made environmental changes. Families have proved themselves to be not only essential reproductive units but also core social units enhancing its members’ survival (Clason, 1983). It is for this reason that researchers have long recognized that the family unit, based on the interaction of household, gender and kinship networks, is a critical linchpin for understanding and predicting disaster behavior (Kirschenbaum, 2003a; Wiest, 1998). Recognizing that the family represents a ‘domestic social structure’ implies that within its normative framework, family units are able to generate behavioral cues to prompt actions, some of which have become clearly associated with disasters. Such a perspective incorporates two major theoretical frameworks. The first is the gendered division of household labor (Kroska, 2004) where a family’s link to disasters would depend on household related gender roles. The second is the family stress model (Murry et al, 2001), where disaster behavior depends upon family network relationships. Singly or together, these theoretical frameworks help in understanding family disaster behavior.

Whatever the source, such family related disaster behaviors are particularly critical before an actual disaster as they represent actions stemming from accumulated historical survival knowledge. They are, in addition, indigenous to family social processes. Intuitively, the family as a social mechanism promotes resilience and increases the capacity for survival (Patterson, 2002), initially from actions taken during disasters, afterward as a post-disaster resource to buffer the traumatic consequences of death and injury (Gerrity & Steinglass, 2003; Miller, 2003; Coffman, 1996; Alway et al, 1998) and in the longer term as a means of maintaining the structural integrity of the family (Cohan & Cole, 2002). Such processes are primarily formed before actual disasters. In short, the family appears to be a viable part of our survival repertoire primarily as an effective conduit for transmitting and reinforcing disaster behaviors. Yet, despite what seems to be a general consensus of the family’s significance in determining disaster behaviors, systematic and empirically derived evidence supporting this belief appears to be lacking. For this reason I will reevaluate the impact of the family, as a structural unit and as a social process, on critical pre-disaster behaviors.
If we look closely at the literature, the impact of families on disaster behaviors has, for the most part, been based on evidence gained through ethnographic, anecdotal and/or indirect observations mainly involving case study reports. These approaches have provided a wealth of descriptive information stressing the involvement of families, primarily through household gender roles, in encouraging family unit survival (Enarson & Scanlon, 1999). Being based on specific case studies however, most lack the generalizability of larger representative national or cross-cultural samples. In addition, such sources of information that have accumulated have been restricted primarily to describing family behaviors during actual or post-disaster events, thereby overlooking the critical preparedness stage. To a great extent what happens during and after a disaster is dependent on pre-disaster preparedness behaviors (Kirschenbaum, 2002). If so, extrapolating from ‘during’ and ‘post-disaster’ behaviors about the role of family may be misplaced. In addition, the emphasis on the traditional family has also tended to ignore disaster behaviors of non-attached family members, be they cohabiting consenting partners or single headed households with or without children, raising the possibility that variations in family structures may lead to variations in disaster behaviors. Given the cultural and geographic diversity of family types, generalizations concerning the family-disaster behavior link may be misleading.

The occasional empirical disaster studies that do focus on the ‘family’ may also be problematic as individual disaster behaviors tend to be interpreted as family unit disaster behaviors. For example, the majority of post-disaster psychological oriented research concentrates on trauma or copings of individuals after disasters but tends to be interpreted as family related phenomena (Norris et al, 2002; Lystad, 1984; Kaniasty & Norris, 2001). More recently there have been studies of gendered disaster behavior that emphasize the role of women, again mainly after disasters, in the context of the family but these tend to minimize the significance of husbands and fathers as family members in these actions (Enarson & Morrow, 1998). In some cases, particularly during evacuations, emphasis has been put on the family household but again with studies based on the empirical analysis of individuals and not the household (Sorensen, 1999; Bateman & Edwards, 2002).
On the one hand, these sets of research can be problematic due to methodological inadequacies. On the other, the information garnered from them can be extremely useful, especially in developing potential theoretical hypotheses. In either case, what still remains is to refocus on family household units as the core building block for an analysis and the social processes which identify them as family units.

Overall, there appears to be a genuine concern and understanding for the place of the ‘family’ in disaster studies (Hultaker, 1985) but this concern has rarely been translated into examining disaster behavior in the context of the family as a single social unit. This has meant that most of what is implied about the impact of families on disaster behaviors is mainly extrapolated from the behavior of individual family members and not families as cogent social units. Nor, has there been a systematic examination of pre-disaster behaviors related to preparedness that are crucial for consequent behavior during and after disasters. This point is important as family actions during and immediately after disasters are likely to have been determined by the contingencies of the moment and the desire to survive while preparedness behaviors would more likely reflect inherent social and normative disaster behaviors transmitted through the family institution. Despite these potential shortcomings, taking what we know as confirmation of the potential significance of ‘family’ behavior in disasters, it is surprising that the relationship has not been examined in greater detail, particularly comparing family household disaster behaviors with those not in traditional family units.

The objective in this paper therefore is to reexamine the robustness of the family household in predicting disaster preparedness behaviors by approaching this issue from two interdependent tracks: by stressing the division of household gender roles through the proxy of family structure types and by looking at familial social processes generated in family networks. In order to do so, it was first necessary to conceptually distinguish various forms of family units.

**Household and Structure**

The common understanding that behavioral outcomes, including disaster behavior, have their basis within the family is not new.
The emphasis on the ‘family social unit’ has been a hallmark of family researchers over the past century (Hareven, 1991). Various definitions have evolved as to the composition of family units, primarily based on the family as a social construction (Bourdieu, 1996) but realized as a gender based nuclear and extended family structure (Canetto, 1996). In general, families progress through various family life cycle stages including various forms of marriage, procreation and dissolution (Kapinus & Johnson, 2003). Each stage reflects a distinct structure that moves the original partners toward parenthood and grandparenthood and children toward new family formation. The relationships that the individual members of a family develop with one another eventually coalesce to become what can best be described as a family kinship network (Kim, 2002). The format of these internal family relationships is influenced by the cultural and religious context within which the family functions (Arroba, 1996). If disaster behaviors are to be explained within the context of the family, it makes a great deal of sense to look at the behavior of the family as a whole and the cultural context within which it appears. Anecdotal evidence collected from a diverse set of case studies of disasters supports the general notion that individual family members will attempt to act in unison with other family members and go to extraordinary lengths to maintain themselves as family units (Perry, 1994). Thus, if disaster researchers argue that the family is a fundamental element in explaining disaster behaviors, a minimum requirement would be to focus on family household units as defined by their normative social bonds within a recognized social structure.

**Family Roles**

The gendered household role model argues that membership in a family household unit is reflected by the family roles played by its members. These roles are influenced by the cultural context within which they take place, subtly determining what and how we act in the face of disasters. For the most part, family roles associated with disasters have led women and men to act out their traditional family gender related roles based primarily on an accepted sex division of
labor (Drabek & Key, 1984; Neal & Phillips, 1990; Goltz et al, 1992; Wenger & James, 1994). In this framework, women are responsible for childcare, and other types of kinship supportive tasks. Male gender roles, on the other hand, are characteristic of leadership, especially as it demands physical strength. Many of the case studies have found variations in these roles but emphasize that women focus much of their energy on their family’s well being (Wenger & James, 1994; Millican, 1993; Dann & Wilson, 1993; Morrow & Enarson, 1996). There are, of course, extreme cultural imperatives that have evolved over time in response to a particular religious cultural environment. The stories of fathers saving a son’s life at the expense of his daughter’s, of mothers dying in their attempts to save their children or property, of wives organizing help and care for the sick and injured and of husbands leaving their families to join disaster search and rescue units, demonstrate variations in family gender roles in cases of disaster. In addition, there is the critical role played by the primary family gatekeeper in preparing for disasters, the “mother hen” or mothers with children in their care (Kirschenbaum, 2003a). For the most part disaster gender roles are the foundation of mutual help among family members (Morrow, 1997; Bolin, 1994). These types of mutual help, based on the interdependent gender roles of family members, are aimed at preserving the integrity of the family unit.

**Gender Bias**

Under the assumption that family household integrity should involve all family members, we should expect research to reflect this diversity. Yet, most studies accentuate the female role in facilitating family survival during and after disasters (Abel & Nelson, 1990; Reskin & Padavic, 1994). A number of studies have shown that women take the threats of a disaster much more seriously than men (Davidson & Freudenburg, 1996; Palm, 1995). They also rely more often on social networks than official sources for their information about disasters (Drabek, 1969). Arguments are also made that these basic female family gender roles have been shifted into community or voluntary organizations when a disaster appears
(Akhter, 1992; Eade & Williams, 1995; Faupel & Styles, 1993). Their absence from formal disaster management organizations may likewise be due to either gender based self-segregation or gender discrimination (Noel, 1990; Phillips, 1990; Fordham & Ketteridge, 1998) but this gender-biased pattern appears to be shifting in public sector disaster agencies.

In the case of men (e.g., husband, father), the literature is more elusive than women about their gendered disaster roles. What is available can be gleaned primarily from arguments and case studies of women’s role in disasters that contrasts them to men. While some evidence is available which specifically matches men and women’s disaster preparedness behaviors (Kirschenbaum 2002), there is an underlying assumption that male dominance in family life is reflected in various aspects of their disaster behavior. This ranges from control in formal organizations to protective behaviors (Noel, 1990; Phillips, 1990). Men are depicted in control of the distribution of supplies and resources, with the care support system allocated to women (Able & Nelson, 1990). The development of informal networks that provide succor and companionship for women, however, are lacking for men and when present tend to disrupt men’s family roles in disasters (Fordham & Ketteridge, 1998). Some evidence has even shown that this lack of social networking may be one of the reasons for family violence after disasters (Wilson, Phillips & Neal, 1998). Other case studies have found that men seem to take the threats of a disaster more lightly than women with men more concerned with the technical or protective aspects of the upcoming disaster (Szalay et al, 1986; Leik et al, 1982, Palm, 1995). The same applies for responding to disaster warnings. Men tend not to hear the warnings and if they do, especially from their wives, to minimize them (Turner et al, 1981; de Man & Simpson-Housley, 1987). Overall, the image these studies provide is that men are the defenders and decision makers of the family and the women are the caregivers (Scanlon, 1998). Unfortunately what evidence is available on family gender roles in disasters is mainly descriptive or anecdotal (Enarson & Morrow, 1998) and in the few cases of empirical evidence, focuses primarily on an individual’s marital status or sex category rather than family membership or social kinship network bonds.
Family Unit Behavior

A review of the literature in which the family is depicted as the unit of analysis in disaster related research appears infrequently and in many cases indirectly. For the most part, the family is viewed through one of its members, be it the mother, father or children. For example, studies have focused on how parental conflict affected children’s stress after a hurricane (Wasserstein & LaGreca, 1998) or how a disaster-related death or injury of a family member had a consequent impact on stress disorders among individuals in that family (Goenjain et al, 1994). However some case studies have also focused on family unit disaster behaviors by describing family disruption after a (Argentinean) flood (Dunal et al, 1985), the remarriage of widows after a devastating earthquake (China) (Chen at al, 1992), family unit evacuations (Hultaker, 1985; Perry, 1994), proposed family tracing programs (Bonnerjea 1994), family unity versus emergency role conflict (Rogers, 1986) and accounting for special needs households (Metz, 2002). Numerous other case studies of natural and technological disasters such as flooding and hurricanes, volcanoes and toxic spills have all described either directly or indirectly the involvement of families engaged in various disaster behaviors. The most relevant of these studies, which directly implicate the family as a unit in disaster behaviors is that families tend not to evacuate until all its members are present, with the decision to relocate done within the context of the family household unit.

Except for evacuation, researchers continue to allude to the family household units’ disaster behavior through its individual member’s behavior. If it is done under the assumption that a single-family member’s action reflects the outcomes of the intricate relationships within the family itself, then it may be possible to speak of a concerted family unit pattern of disaster behavior. But, if this is not the case, then such an implication may be misplaced. This dilemma can be argued both ways, confidently only if we assume the homogeneity of behaviors in all types of family structures. As this is probably not the case, with wide diversity in structure, role obligations, decision mechanisms and power relationships, extrapolating from, for example, what the husband does in an American small nuclear
family, may not apply to a husbands actions in a clan based extended agricultural based family unit in India.

**Potential Family Impact**

Even a cursory view of the ‘family’ literature in disaster behavior points toward a distinct bias in favor of the traditional family household unit. By broadening the concept of family to include non-traditional households, such as cohabiting partners and single headed households, a potentially more complex picture of the family’s impact on disaster behavior may emerge. Again, from very limited evidence based primarily on the link between marital status and disaster behavior, assuming that non-married persons constitute a household, it appears that being single or married has little significant impact on the choice of, for example, official or traditional information sources sought to be prepared for a disaster nor on how risks are perceived (Kirschenbaum, 2003b). One unusual case study that contrasted single-married households (Japanese relocatees) even suggested that living in a household was not as important in coping with residential dislocation than the ability to initiate a caring relationship with others (Clason, 1983). Extrapolating these limited results based on marital status of family household members and disaster behavior provides some indication that perhaps the concept of family disaster behavior should encompass, along with traditional family units, other types of non-married family household structures and more varied membership.

**Complementary Structures**

Taking this perspective allows me to conceptually distinguish the family into three distinct household structures: traditional, cohabiting and single. The underlying assumption is that the intensity of familial social life, in terms of the normative household obligations to other family members and partners, as well as children if present, will have a direct impact on how family units act both in preparing for disasters and in times of crisis. This perspective puts an emphasis on the family stress model where family social networks outweigh
household gender role divisions. In this framework, each family type, by reason of its structural framework, will delineate the extent and intensity of its networks. Of course, such bonds built upon family social networks may extend beyond the nuclear family structure and incorporate relationships with other extended family members (Kirschenbaum, 2004). Thus, newly married couples, for example, usually extend their family networks by incorporating both in-laws into their social web. Cohabiting partners may be less successful at entering into existing family networks but single headed household members are least likely except through their family of procreation or when siblings get married. In the case of extended family units, such networks may encompass grandparents, relatives and cousins. The extent of these ties has been assumed to be beneficial in dealing with disasters but recent evidence seems to question this in the area of preparedness (Kirschenbaum, 2002). Thus, it can be hypothesized (H1) that the extent of the social networks generated by the family household structure will have an impact on the degree to which the family is prepared for a disaster.

In addition, a second possibility is based on the assumption that gender roles of the family members, as partners and/or parents also influences disaster behaviors. The basis for these assumptions is that within the framework of each societal culture the ‘traditional’ family unit is based on accepted formal and culturally binding marriage arrangements that influence gender related marriage obligations. Cohabitating partners who live together in the same household with the absence of a legal contractual relationship would likely have less binding formal criteria affecting their familial and gender roles. These family obligations and gendered marriage roles would be even more difficult to pinpoint in the single individual household due to the absence of a partner with whom a familial relationship could be formed. We could therefore speculate that (H2) disaster behaviors will vary by the type of family structure as it reflects the strength of the normative gendered marriage obligations of its members.

A third set of family processes likely to affect disaster preparedness is associated with being a mother or father rather than just a partner or single person. Here, the underlying assumption is that parenthood is more likely to invoke intense family role obligations
and responsibilities than with persons who are not parents. The key deciding factor depends on households having or not having children present in them. Here, it seems reasonable to argue that as a considerable proportion of family gendered role obligations relate to children, families with children present would invoke greater levels of preparedness than families without children. If so, it would be possible to hypothesize that (H3) the family household unit does have an impact on disaster behavior but is conditional on both the type of family structure and the presence of children.

In addition, it may be possible that part of the family’s influence on disaster behaviors may be due to the strength of the social bonds that are generated within the family members’ network. This argument assumes that the key to consensual family disaster behaviors emerges from intra-family network communications based on the transfer of disaster role model knowledge between its members. If familial networks are operative, allowing the opportunity to pass along disaster related role behaviors with which to socialize (or in the short term persuade) its members, it is possible that single headed households, as part of these networks, and recipients of the same knowledge, are equally influenced along with other family members. A recent study of the impact of kinship ties on preparedness, which included immediate and close relatives as part of the networks, substantiated this possibility (Kirschenbaum, 2004). In this case, it can be hypothesized that (H4) the intensity (and not just existence) of family social networks is the key to being prepared for a disaster.

Methodology

Research Strategy

To actually test the alternative competing hypothesis explaining family disaster preparedness behavior as a result of the family household structure, the extent of familial social networks, marriage related gender roles, the presence of children and the existence of social networks outside the family, it was necessary to have a data set that was composed of family households. Interviewing the adult members of household units and incorporating all other family
members into the interview schedule accomplished this objective. The resulting sample separated family units by their primary family structure (e.g., being married, cohabiting or single household heads), if children were present in the household and the extent and intensity of family related social networks. To assess how these family characteristics affected family disaster behavior, “preparedness” was chosen as it is a core disaster concept that represents actual behavior of potential disaster victims and can be measured by objective criteria. It is also a behavior that is independent of the presence of an ongoing disaster and represents outcomes based on normative behaviors learned and transmitted from past experiences.

**Figure 1: Theoretical Model of the Impact of Family on Preparedness Disaster Behavior**

The theoretical working model (See Figure 1) and its potential derivative propositions lays out alternative paths that hypothesize how different family units could potentially affect preparedness behaviors. The model is based on the assumption that different family forms (i.e., traditional, cohabiting, individual) could by themselves have an impact on preparedness levels. Similarly, it raises the possibility that the socially derived content of such family forms, primarily the intensity of kinship bonds, distinct gender roles and the presence or absence of children, may also be involved in determining levels of preparedness. In addition, the model suggests that family preparedness should be viewed in terms of four separate preparedness components.
entertaining the notion that the emphasis on preparedness may be affected by family form as well as its social contents. From these underlying notions, a series of hypotheses are derived.

The general model hypothesis is that (H1) family units based on traditional cohabiting structures have a greater impact on disaster preparedness than non-traditional family unit structures. (H2) that socially robust family units based on extensive and intensive familial social networks or (H3) those having children present in them have a greater impact on preparedness than families with weaker social bonds and no children. Moreover, (H4) the structure of family units can be employed to predict the level of preparedness among its members. The confirmation or rejection of these hypotheses should provide a compelling empirical basis for determining if, as disaster researchers suggest, the family can be of utility in determining disaster preparedness behaviors.

**Data Source**

The data on the impact of families on preparedness was derived from a larger study on preparedness for conventional and non-conventional disasters conducted in Israel (Israel Government, 2001). It was based on a national representative household survey of the Israeli adult urban population 18 years or older residing in areas of 10,000+ persons. A total of 814 adult household member interviews in 150 urban areas were conducted over a two-week period with sample size based on each urban areas proportional population size as recorded in the 1999 Israel Census. The survey employed a random-digital-dial, computer-assisted telephone survey of each household respondent based on interviews that lasted about 20-25 minutes. Only residential household units were included in the population from which the sample was drawn. As the questionnaire schedule also inquired about all the members of the household, information about spouses, partners, children, relatives and all others resident in the household were available. The only constraint imposed on the sampling design was that the gender of the adult household respondent be equally distributed (rotated) regardless of marital status. The actual telephone interview relied on
a closed-ended structured questionnaire that included, among other questions, those related to social networks and preparedness. Given the subject matter and sponsor (Israel Defense Force Home Front Command), refusals were extremely rare due to the explicit trust and high regard held for this institution. Only 11 households refused to be interviewed with alternatives randomly selected. Included in this survey were questions covering a broad range of areas and background variables theoretically linked to social networks and preparedness. It should be noted that nearly all the respondents had experienced, been involved in or familiar with a variety of other types of disasters such as natural (earthquakes), industrial (toxic or chemical spills) or technical disasters (power outages, Bug 2000), accidents (road, work) and terror attacks as well as gone through the 1991 Gulf War missile attack.

**Background**

The final sample matched census data on the basic characteristics of the Israeli household population living in urban areas. Most of the household sample were married (80%), had 2–3 children (52%), highly educated with a college or more education (44%), lived in dual earning households (60%), in good health (72%), between 40-60 years of age (47%), native born (51%), in the labor force (54%), Jews (87%) and evenly distributed for above/below average income. Family structures ranged from traditional married couples (79.7%), non-married consenting cohabiting partners (2.3%) to single headed households (18.0%). Cohabiting partners were on the average much younger than either single or married couples (39.1 years vs. 46.8 and 46.5). Educational attainment among the three family groups, however, was similar, averaging 13-14 years of schooling whereas income levels differed with married couples having higher average incomes than both single and cohabiting partners. Close to half of both the partner-couples in traditional family units (47.1%) and slightly less among cohabiting partners (42.1%) contributed to their overall family income. The occupational distribution among the family types only varied slightly with most classified as professional (31.6%) or working in salaried jobs (36.6%).
Variables

Preparedness, the dependent variable, is measured on the basis of Kirschenbaum’s (2002) Preparedness Component Scale. ‘Preparedness’ definitions in this scale were generated from a factor analysis of the 31 consensual definitions acquired from alternative sources such as disaster experts, disaster management organizations, the research literature and a national representative sample. This led to creating four broad preparedness components, namely (1) levels of provisions or supplies available in the home, (2) knowledge of and ability to utilize survival and first aid skills, (3) having evacuation and family plans at the ready, and (4) protective physical shelters or sealed room. These components were methodologically corroborated by a series of regression models that confirmed the independent nature of each in terms of independent explanatory variables. As each of the preparedness components are measured by their factor loadings, they were divided into four levels ranging from very positive to very negative according to each factor’s specific loading range, from being very prepared to being completely unprepared. The preparedness components measured actual preparedness actions on the part of the household respondent.

Family unit structure, a prime independent variable, is based on three structural family types: traditional, cohabitation and single. To differentiate between family unit structures, each household adult interviewed was also asked a series of questions about the household including the marital status of all its members. Traditional units were defined as households having at least one married couple, cohabiting partner family units were composed of adults living in the household who declared they were living together as a ‘couple’ but not formally married, and single-family units contained non-married or non-coupled individuals (e.g., single resident, divorced, widowed or simply having roommates). Table 1 provides the alternative distributions of traditional and cohabiting family structures. Various combinations of these three structural forms were examined by both correlation and non-parametric tests to discern if any significant differences existed between them. The results indicated a strong overlap between the married-cohabiting family units ($r=0.97$, and a non-significant
association to several key demographic characteristics) suggesting their collinearity. The conclusion was that a simple dichotomous categorization based on ‘couples’, combining traditional married couples and cohabiting partners as one category, and single non-married, divorced or widowed headed households as a separate second ‘single household was representative of the basic family structure types. This distinction between ‘couples’ and ‘single’ households could be interpreted in terms of the social contract among couples, be they formally married or not to each other and the independent character of households inhabited by single individuals.

Table 1: Percentage Distribution of Family Unit Structures by Gender of Household Head

<table>
<thead>
<tr>
<th>Gender</th>
<th>Traditional Family Structure</th>
<th>Cohabiting Structure</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Married</td>
<td>Single</td>
</tr>
<tr>
<td>Male</td>
<td>85.2%</td>
<td>14.8%</td>
</tr>
<tr>
<td>Female</td>
<td>73.9%</td>
<td>26.1%</td>
</tr>
</tbody>
</table>

Children Present was measured if the household head (either the man or women) had children presently living in their household. This distinguished between employing the purely demographic measure of ‘ever borne children’ who, due to their age, may have left the household to form an independent residence in contrast to those children still present in the household. Having children present has been a key factor in the developmental stages of family life and gender roles and could thus make an important contribution to how their parents prepare for a disaster. Under these terms, having young or older children should not make a significant difference in the family unit behavior. Support for this assertion was obtained in a preliminary analysis matching the number and ages of children present in the household against the four preparedness components, resulting in non-significant Pearson Chi Square coefficients (supply: p=0.49, skill: p=0.21, planning: p=0.18 and protection: p=0.07). This was interpreted to mean that the age and number of children in the household made little difference on the parents’ preparedness
behaviors. On this basis, those households with resident children were categorized as “parent oriented families” and those with none present as “non-parent families”. This measurement of parenthood (beyond just being a father or mother) reflected the importance of children in the development of gender role disaster behaviors on the part of parents. It also provided an opportunity to judge the degree to which children in families—be they traditional, cohabiting or single—have an impact on their parents’ disaster preparedness.

Family social networks were measured by a series of questions seeking the social intensity of family networks for each household head. Here, it was assumed that the level (density) of the social relationships fostered by networking within the broader family context would initiate and sustain family social links that would affect preparedness behaviors. Recent evidence has suggested that such networks did impact on disaster behaviors (Kirschenbaum, 2004). These social bonds, based on the density of family social networks, were measured with five Likert type scale questions (categorized from 1-4), asking the respondents to measure various aspects of their family relationships as a proxy for the intensity of their family social networks. They included measuring (1) the respondents’ personal relationship with his/her family, ranging from very good to not good at all, (2) if they lived in very close/very far physical proximity to other immediate family members, (3) the frequency of visits to family (everyday to rarely), (4) level of communicating through telephone conversations and (5) a measure asking if the household head discussed everyday matters with other family members. Each separately and/or in combination reflected key aspects of family networking and the intensity of the ties.

Gender, another potential independent explanatory variable was measured on the basis of the dichotomous categorization based on male and female sex. As the sample of households was selected by rotating the sex of the household head, it was possible to separate the family unit and focus only on the household head. Other male or female members could be distinguished by their family status as children, relatives, or roommates. The sex of the household head is admittedly a poor proxy for understanding the broader social meaning of gender and gender roles but it nevertheless does provide an indicator of what significance gender roles may have on family preparedness.
Results

Family Preparedness

The argument that the family is a key social structure enhancing disaster survival can now be examined by comparing the degree that couples and single-family units prepare for disasters. The data in Table 2 refines this argument by looking separately at the basic preparedness components for couples and single unit households. For the ‘family’ argument to be salient, the data should show that (traditional and cohabiting) couples would be more prepared than single households at every level of preparedness. Thus, we should find family units composed of couples with higher preparedness levels than single-family households independent of the four basic preparedness components. What the data reveal, however, is a mixed pattern seemingly contradicting the assumed family advantage over non-family preparedness behaviors. For example, being “very well prepared” was more typical of single headed family units and less so for family units composed of couples, when measured by having supplies (+7.2%), upgraded skills (+1.5%) and protection (+0.1%). Only in the planning category are couples more prepared than single headed households (+4%). At the other extreme of being ‘least’ prepared, where we would expect to see single household families dominate, a mixed pattern again appears. Households made of traditional or cohabiting couples are more prepared than single households in the skills and planning components but less so in being supplied for emergencies. In the area of protection they are equivalent. A similar varied pattern appears for the middle level preparedness levels, namely “not so much” and “reasonably” prepared. This overall tendency towards an inconsistent pattern, where coupled family households are more prepared than single households for certain types of preparedness and not in others, raises the possibility that the generalization supporting the family as a key survival mechanism in disasters may be more complicated than originally thought. To further explore this possibility, and avoid the pitfalls of simple proportional analysis, the data were subjected to non-parametric Chi Square analysis based on the Pearson coefficient contrasting couples and single households by their levels of preparedness.
Table 2: Couples and Single Household Units by Level of Preparedness

<table>
<thead>
<tr>
<th>Family Type</th>
<th>Component</th>
<th>Level of Preparedness</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Supplies*</td>
<td>Least</td>
<td>Not Much</td>
</tr>
<tr>
<td>Couples</td>
<td>20.0%</td>
<td>33.1%</td>
<td>35.6%</td>
</tr>
<tr>
<td>Single</td>
<td>23.7%</td>
<td>32.2%</td>
<td>30.5%</td>
</tr>
<tr>
<td>Skills</td>
<td>21.7%</td>
<td>28.4%</td>
<td>48.9%</td>
</tr>
<tr>
<td>Planning</td>
<td>18.6%</td>
<td>32.2%</td>
<td>46.6%</td>
</tr>
<tr>
<td>Protection</td>
<td>6.8%</td>
<td>9.2%</td>
<td>30.6%</td>
</tr>
<tr>
<td>Single</td>
<td>10.6%</td>
<td>9.7%</td>
<td>30.1%</td>
</tr>
</tbody>
</table>

*Pearson Correlation $\chi^2 = 0.05$ for 2 tailed test

The results of the analysis reveal that the only type of preparedness behavior where there is a significant difference between couples and single households involve having emergency supplies at hand. In all other cases involving actual preparedness behaviors, be they upgrading emergency skills, coordinating emergency family plans or investing in physical protective equipment, there appears to be no significant difference between being a traditional/cohabiting family or a single-family household. Simply put, except for being prepared by purchasing and stocking supplies, the type of family structure makes little difference in being prepared. Being a member of a traditional or cohabiting family does not give its members an advantage over single headed families in the level of preparedness of three of the four preparedness components.

Alternative Explanations

If traditional/cohabiting family structure has such a marginal impact on being prepared (except for stocking supplies), additional confounding family related variables are available that may affect preparedness behaviors. This approach assumes that families are
dynamic social institutions that display a variety of interconnected social behaviors. One such phenomenon that may affect preparedness behavior relate to family social relationships generated by social networks. To explore this possibility, a series of questions measuring the density of family social networks was obtained from the household respondents. Such networks reflect the links that family members have not only with their own immediate family but also with other close relatives. This measure therefore encompasses not only traditional families but also single headed families who maintain social links with other family members. This distinction allows for a comparison of the two basic types of family structures, couples and single households on the basis of the intensity of their familial relationships.

Table 3: Significant Differences For Couples and Single Household Families by Measures of the Intensity of Family Networks

<table>
<thead>
<tr>
<th>Intensity of Kinship Networks</th>
<th>$\chi^2$ Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>How would you characterize your relationship with your close family relatives?</td>
<td>17.129**</td>
</tr>
<tr>
<td>How close do you live to your close relatives?</td>
<td>3.437</td>
</tr>
<tr>
<td>How often do you visit your family relatives?</td>
<td>12.423**</td>
</tr>
<tr>
<td>How Often do you phone close family relatives?</td>
<td>16.566**</td>
</tr>
<tr>
<td>Do you usually ask advise about daily problems from close family relatives?</td>
<td>19.025**</td>
</tr>
</tbody>
</table>

**$p>0.00$

The data in Table 3 reveal that couples and single headed families significantly differ in the intensity of their family social networks. The direction of these relationships suggests them to be substantially more intense in traditional/cohabiting families than single headed households. These measures of networking include both formal and informal interactions based on face-to-face visits or indirect communications via telephone contact. As network density affects preparedness (Kirschenbaum, 2002), there is a good chance that family structure acts as a framework and a catalyst enhancing familial
social networks and through this to attention paid to preparedness by its network members.

Another set of possible confounding variables inherent in family interactions that may impact on preparedness levels is the number of the family members resident in the household. Under the assumption that as the number of interactions increases with increased family size, so does interdependent familial role obligations. This in turn might lead families to be more sensitive about being prepared for a disaster. Given the fact that single headed households also may contain more than one member (e.g., divorced or widow with children), it is possible that size alone confounds the link between family structure and preparedness. There is, in addition, the possibility that preparedness may be indirectly related to family size through the presence or absence of children. The respondents in the sample seem to give weight to this possibility as even though couples are strikingly and significantly different from single head households in terms of family size ($\chi^2 = 0.000$), close to half (48%) of the single, mainly female (68%) headed households, have children residing within them. This opens up the possibility that the presence or absence of children may make a difference in being prepared. In a sense, what we may be looking at is the “mother hen effect” with the composition of the family and the sex of the head of household of greater relevance than size.

**Competing Explanations**

With the marginal advantage of traditional/cohabiting families over single headed families to be prepared in three of four basic preparedness components, the above alternative family connected explanations for being prepared gains credence. Is family preparedness due to family social networks, gender of the household head or having/not having children resident in the family. To fathom which can shed light on preparedness behaviors, either singly or in combination, a set of regression models were generated for each preparedness component. The results in Table 4 reveal that the best predictors were found to lie in the social networking and gender variables. This pattern, however, was not consistent. Networking
variables dominate the predictors for ‘supplies’ and ‘planning’ preparedness components while both gender and networking variables impact upon the ‘skills’ and ‘protection’ components. It is important to recognize that no significant coefficients appeared by family type (couple/single) or by the presence/absence of children in the household.

Table 4: Summary Results of Regression Coefficients for the Impact of Family Household Units, Strength of Family Bonds, Gender and Children on Components of Preparedness

<table>
<thead>
<tr>
<th>Variables</th>
<th>Supplies</th>
<th>Preparedness Components</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Skills</td>
</tr>
<tr>
<td>Couple/Single Households</td>
<td>0.052</td>
<td>0.038</td>
</tr>
<tr>
<td>Family Networks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequency of Visits</td>
<td>0.122*</td>
<td>0.116*</td>
</tr>
<tr>
<td>Telephone Family &amp; Relatives</td>
<td>0.005</td>
<td>0.038</td>
</tr>
<tr>
<td>Seek Family Advise</td>
<td>0.051</td>
<td>-0.049</td>
</tr>
<tr>
<td>Proximity to Relatives</td>
<td>0.115**</td>
<td>0.015</td>
</tr>
<tr>
<td>State of Family Relations</td>
<td>-0.034</td>
<td>-0.064</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male/Female Household Heads</td>
<td>-0.009</td>
<td>0.235**</td>
</tr>
<tr>
<td>Children</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Have/Not in Household</td>
<td>-0.031</td>
<td>0.000</td>
</tr>
<tr>
<td>Model Significance</td>
<td>0.001</td>
<td>0.000</td>
</tr>
<tr>
<td>R Square</td>
<td>0.051</td>
<td>0.83</td>
</tr>
</tbody>
</table>

1 Standardized Beta Coefficients

*p > .05  ** p > .01

A closer examination of the significant coefficients suggests that there is no single or consistent set of family related social network predictors across the four preparedness components. Each component is affected by a unique set of circumstances that emerge from specific
family social network behaviors. Closer proximity to relatives and more frequent visits apparently are key processes to induce families to being stocked with supplies, regardless of being a couple or single headed household. Similarly, greater frequency of such family visits also prompts upgrading of survival and emergency skills. This positive relationship between network ties and preparedness does not hold in all instances. In the case of being prepared by planning ahead and investing in protective equipment, it is the weaker network ties that promulgate greater levels of preparedness. Thus, planning is more likely when there are difficult family relationships among its members and relatives while protective actions come about when the family group members are more physically dispersed.

Gender also plays an important role in affecting preparedness behaviors but is restricted to the case of “skills” and “protection”. The data suggest that there is a distinct positive bias toward female household heads in stimulating the upgrading of emergency skills and investing in protective measures in case of a disaster. This does not appear to be the case for ‘supplies’ and ‘planning’ where the non-significant signs of the coefficients suggest that these preparedness areas tend to be more the province of men.

**Summary**

The fundamental position of the family as a social mechanism to enhance survival during and after disasters is rarely questioned among disaster researchers. The numerous anecdotal and ethnographic evidence of how families behave and overcome diverse types of disaster fill the literature and attest to the capacity of families to survive, cope and recover from disasters. Yet, a careful reading of the evidence shows many problematic areas, both methodological and substantial in coming to this conclusion.

The initial analysis comparing traditional/cohabiting family household with single headed households by the four core preparedness components showed that couples do not have any great advantage over single headed households in being prepared. Except for stocking supplies, this finding appeared to raise some disturbing questions about the utility of the traditional family structure in predicting disaster
behavior. Another reasonable alternative explanation led to testing substantive internal social processes associated with family life. In short, it was an attempt to look at the content of family life rather than its form. As an approximation of some of these processes, the analysis included the intensity of family social life reflected through its social network patterns, the normative parent-child obligations related to having children present in the home and finally an indication of the impact of sex-gender roles estimated by the household heads’ gender.

The results of the regression analysis showed that preparedness for disasters involves one or more elements that are inherent in family processes and has little to do with the actual structural features of the family household. When these competing factors are placed side by side, it becomes clear that specific types and intensity of family based social networks and the gender of the household head best explained varying levels of core preparedness components. Even here, not all social network measures affected preparedness components equally with the results showing each core preparedness component to be associated with specific types of network characteristics. When competing against other possible explanations, it was not surprising that the preparedness levels of couple (traditional and cohabiting) or single-family household structures were not significantly different. This meant that many of the characteristics we identify with being a family and that should affect disaster preparedness are not exclusive to any particular family social structure. What did seem unusual was that the presence or lack of children in the household did not significantly effect being prepared.

Taking these results together, it is now possible to reflect on the basic set of hypotheses that were originally put forward. For one, the findings do not support the first hypothesis that (H1) family household units based on traditional cohabiting structures have a greater impact on disaster preparedness than single household family structures. What is supported by the data is that (H2) socially robust family units characterized by extensive familial social networks to a large extent predict levels of disaster preparedness. This predictive ability does not however, depend on (H3) households having or not having children present in them. Moreover, the overall conclusion is that (H4) the structure of family household by itself cannot be employed
to predict the level of preparedness among its members. What appears more likely is that family disaster preparedness is affected by internal familial social processes such as the complex set of social networks that evolve in family relationships and the gender obligations of the household head as expressed by the mother-hen effect.

**Conclusions**

The utilization by disaster researchers of ‘the family’ as a panacea to explain disaster behaviors rests on a belief that the ‘family’ is a key player in determining disaster behaviors. Yet, from the present analysis this belief does not entirely hold up under empirical scrutiny. This gap may be explained by a combination of factors. Primarily, there has been the lack of a clear definition of ‘family’, allowing the use of individual behavior to reflect on and in some cases represent that of their family members. Another possible explanation has been the restricted focus on family post-disaster behaviors as well as the extrapolation from selective case studies. More vague but nevertheless relevant has been a positive ideological bias toward the traditional family as the bedrock of society (as opposed to other structural forms) and certainly toward its own survival.

For the family-disaster behavior link to hold up under examination, however, it would be expected that researchers would contrast disaster behaviors of families against non-families and examine in more detail pre-disaster preparedness and not only post-disaster behaviors. If ‘families’ were indeed crucial to understanding disaster behaviors, such a comparison would substantiate their significance. In actually doing these comparisons, I saw that the impact of family on preparedness varied little by family household structures, leading to the conclusion that diverse forms of family household structures, and not only traditional married couples, have an impact on disaster preparedness behaviors. If such disaster behavior cut across family types, perhaps it was generated by a common set of more deeply rooted social processes that are characteristically found in most families. And, indeed, this is what emerged in the analysis.

Of particular significance in explaining core preparedness components (supplies, skills, planning and protection), was the
appearance of family social network variables. Such network variables reflect both the internal and external links that family household members have with other family members. The generation of such networks is very complex as they primarily reinforce normative familial obligations by establishing social bonds, status and power relationships while also simultaneously creating channels for transferring or communicating disaster information. The exact mechanism for how networks induce disaster behaviors such as preparedness has still to be examined in detail but it appears that it is complicated by gatekeeper effects and risk perceptions made by key opinion node members (Kirschenbaum, 2003).

A second family process variable is reflected in the gender of the head of the household. Given its direct link to family households, gender becomes more than a demographic measure of the household head’s biological sex and can be interpreted as likely related to the normative family obligations attached to it. The analysis demonstrated that when in competition, gender statistically overwhelms having children present in predicting levels of preparedness. Yet, there still remains the possibility that such normative family role obligations are related to the mother-hen effect which joins mothers to children as a potent combination in generating disaster preparedness (Kirschenbaum, 2003a). As close to half of single headed households do have children present with the majority of them headed by women and nearly three-quarters of coupled households have children present, it may very well be that in female headed households, the presence of children heighten the normative protective gender role generally played by women, leading them to be better prepared for disasters. What is clear from the results is that female household heads are an important integral part of the decision process to be prepared.

**Implications**

When researchers look at the family as a primary resource to understand how disaster behaviors are generated, it is important to recognize that families come in different sizes and shapes and that disaster behaviors range from being prepared to long-term post-disaster survival. What was discovered here strongly suggests
that the form of the family household structure is far less important than the on-going internal social processes found in them. What is today nominally called family disaster behavior is simply too broad, and perhaps an inappropriate use of the concept. The traditional ideal type nuclear family that has served disaster managers in their planning may be a convenient but potentially dangerous myth. What seems much more appropriate is to include diverse family households in the disaster management process and pay more attention to their particular internal family related social processes. These processes, primarily based on family social networks and gender role obligations, form a cogent set of building blocks from which to trace how families as social units make decisions about their own survival in case of a disaster.

Acknowledgement

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Notes

1. These positive attributes of the family as a social unit enhancing survival do not deny internal family gender conflict including violence and divorce that sometimes arises as a consequence of disasters.

2. This bias reflects an undercurrent of accepting the ‘ideal’ household structure generated among western researchers that excludes grandparents, nesting returning couples, older children, etc.

3. Various definitions of ‘traditional family’ have been suggested. In general they tend to stress characteristics related to gender roles (patriarchal) and family networks (extended). Here, traditional family structures are defined in terms of being a married different sex couple residing together with/without children or relatives.

4. It should be noted that the four basic generic preparedness components are also relevant to various disaster situations and disaster
types. Bomb shelters, tornado cellars, hurricane or flood resistant homes are, for example, various types of protective physical shelters.

5. It may be possible to speculate that disaster researchers may have also been influenced by post WW II efforts to encourage women to return to their traditional family roles both as a means to move them out of the labor force to accommodate returning decommissioned soldiers and back into their roles as nurturers by idealizing middle class family values and role expectations.

6. The majority of empirical studies which employ gender (sex) as an independent variable to explain disaster behaviors usually do so outside the context of the family household making it extremely difficult to distinguish if the household head is a women. For example, female family members can include a variety of categories such as mother, wife, daughter, nieces, etc., all of who have different gender role within the context of the family. By looking directly at the gender of the head of household, more certainty is gained in interpreting the type of gender/family role that is likely to be played.

References


