

Wutich, Amber. (2009). Intrahousehold disparities in women and men's experiences of water insecurity and emotional distress in urban Bolivia. *Medical Anthropology Quarterly* 23(4): 436-454.

This is the authors' post-print. Please cite the final version of the article, available at <http://dx.doi.org/10.1111/j.1548-1387.2009.01072.x>

Abstract

This study is one of the first to examine the links connecting water insecurity, gender, and emotional distress. The article presents quantitative and qualitative analyses of interview data collected from randomly selected pairs of male and female household heads (n =48) living under the same household-level conditions of water insecurity. The results provide partial confirmation of past findings that women are more likely than men to be burdened with everyday water responsibilities. However, there were no significant differences between men's and women's experiences in household water emergencies (i.e., water shortages and last-ditch attempts to buy water) and reports on some measures of emotional distress (i.e., worry, annoyance, and anger with family members). The results suggest that intrahousehold gender disparities may be mitigated in times of severe water scarcity. The discussion raises questions about the comparability of men's and women's expressions of emotional distress.

Keywords: [Gender; water scarcity; social suffering; Cochabamba; urban poverty]

Experiences of social inequity and injustice undermine mental wellbeing in a variety of ways (Kleinman et al. 1997). For instance, recent research reveals that poverty and food insecurity are associated with emotional distress, anxiety, and depression (Patel and Kleinman 2003, Coates et al. 2006, Hadley and Patil 2006). In comparison, very little research has examined the effects of water insecurity on mental wellbeing. While the biophysical impacts of water insecurity—which include at least 2 million deaths and 4 billion cases of diarrhea annually (Gleick 2004)—are well understood, we know less about the impacts of water insecurity on mental health. If water insecurity is linked to negative mental health outcomes, as findings now suggest (e.g., Ennis-McMillan 2006, 2001), the health-related costs of water insecurity could be even higher than previously anticipated. Because gender is widely recognized to play an important role in shaping water access and use (Wallace and Coles 2005), women and men may experience water-related stressors in very different ways. This paper examines intrahousehold variation in gendered experiences of water insecurity and emotional distress among the urban poor in Cochabamba, Bolivia, a city famous for a revolt over inequities in the water sector in 2000 (Assies 2003). This study answers a call for more research examining the differential impacts of water issues on women and men (Ray 2007), and fills a gap in the broader literature on poverty, mental health, and gender.

Background

Anthropologists have employed a number of concepts to investigate how social factors shape mental health. Within the tradition of critical medical anthropology, scholars use the “social suffering” concept to examine how bodily distress is rooted in social and structural violence (Kleinman et al. 1997). Within the psychological tradition, researchers screen respondents for the presence of “common mental disorders” (e.g., Patel and Kleinman 2003), or those defined by the ICD-10 as mood or affective disorders such as depression (F30-F39) and neurotic, stress-related, or somatoform disorders such as anxiety (F40-F49), using standardized questionnaire instruments (WHO 1992). Within the biocultural tradition, anthropologists bridge the political economic approach of the critical tradition with the diagnostic approach of the psychological tradition. Drawing on concepts such as “psychosocial distress”, biocultural anthropologists examine mental health outcomes using biomarkers, standardized psychological questionnaires, and idioms of distress (e.g., Pike and Williams 2006). In the critical, psychological, and biocultural traditions, “emotional distress”—defined as the presence of negative affective responses or states—is a key concept used to explore and identify how social factors affect mental health. In this paper, I focus on emotional distress because of its broad relevance to anthropological research on mental health.

To understand how inequity and insecurity are linked to mental wellbeing, a brief review of the literature is necessary. Recent research in anthropology and allied fields has contributed significantly to our understanding of the effects of inequity and insecurity on mental health. Studies conducted in a variety of cultural contexts have shown that poverty is one of the social factors most associated with common mental disorders, such as anxiety and depression, in low- and middle-income countries (Patel 2007). People who have lower socio-economic status, less income, lower education levels, lack basic necessities, or face economic crises are more likely to suffer mental disorders (Patel and Kleinman 2003, Ortiz-Hernández et al. 2007, Gorn et al. 2005). In general, women are at higher risk for anxiety and depression than men; furthermore,

the link between socio-economic status and mental disorders is stronger for women than for men (Poblete et al. 2008, Ortiz-Hernández et al. 2007, Patel and Kleinman 2003). One reason for this may be that women's restricted access to resources, income, and health care puts them at higher risk for the mental disorders associated with poverty (Patel 2007, Rios et al. 2003).

Research focused on the poverty of specific resources has also been successful in explaining the incidence of mental disorders. For instance, food insecurity has been linked to emotional distress, anxiety, and depression across cultures (Coates et al. 2006, Hadley and Patil 2006), with significant gender effects (Hadley et al. 2008, Pike 2004). Compared with food insecurity, there are only a few studies, all conducted in developing countries, that examine the links between water insecurity, mental health, and gender. Ennis-McMillan's (2006, 2001) critical interpretive study of "suffering from water" in a Mexican town was the first to establish the relationship between emotional distress and insufficient water for drinking, bathing, and other domestic uses. While both men and women experienced fear, worry, anger, and other negative emotions over water scarcity, women appeared to be more vocal about these issues. Research in urban Bolivia found that heads of female-led households experienced significantly more emotional distress over water insecurity than heads of male-led households (Author and Ragsdale 2008). A comparison of men and women's responses to drought in Brazilian cities found, first, that women generally suffered from more anxiety and emotional distress than men and, second, that exposure to drought conditions increased anxiety in women and emotional distress in men (Coelho et al. 2004). Moving beyond water scarcity, research on slum dwellers in India found that women experienced more distress over water pollution than men (Siddiqui and Pandey 2003).

The few studies that have explicitly examined the links between water, mental health, and gender suggest that women's confinement to the home and obligation to complete household tasks may cause them to experience more water-related emotional distress than men. However, none of these studies conducted systematic comparisons of women and men's division of labor or economic responsibilities in water-insecure households. As Zamani et al. (2006) argued, more research is needed at the intrahousehold level to disentangle the relationship between water scarcity and mental health. A closer look at the literature on water and gender shows why more in-depth, systematic study—particularly at the intrahousehold level—of men and women is needed.

Water Insecurity and Gender Disparities

Gender is widely understood to affect how people acquire, use, and protect water resources (Wallace and Coles 2005). In the Dublin Statement on Water and Sustainable Development (WMO 1992), the international community recognized the central role that women play in water issues. Later international agreements, such as Agenda 21 of the Rio Declaration on Environment and Development (UNCED 1992) and the International Covenant on Economic, Social and Cultural Rights General Comment on the Right to Water (United Nations 2002), affirmed the importance of gender in water acquisition and provision. Yet these agreements, and the studies they inspired, have tended to conflate gender with a focus on women (Wallace and Coles 2005). Yet these agreements, and the studies they inspired, have tended to focus primarily

on women's role in water acquisition and to neglect broader questions regarding the gendered construction of water insecurity (Wallace and Coles 2005).

To date, most research has focused on establishing that water-related burdens fall disproportionately on women and girls. For instance, women tend to be responsible for managing the entire family's water use (UNDP 2006, Ray 2007). As in food-insecure households, women may prioritize the needs of other household members above their own, putting themselves at risk for dehydration and water-related illnesses. Inadequate water for sanitation purposes may also be a source of distress or shame (UNDP 2006), particularly for women and girls who may feel more pressure to conform to hygiene and beauty norms than men and boys. Beyond the stresses associated with water use, the physical work involved in water acquisition can have a negative impact on women. Chores such as walking to water sources, waiting in line, and carrying water may take up to four hours a day and are undertaken primarily by women and girls (UNDP 2006). These tasks have been found to consume as much as 30 percent of women and girls' daily energy and result in physical injuries to spines, necks, backs, and knees (Page 1996, Ray 2007). The time that women spend engaged in avoidable water-related work is a major source of time poverty and income loss (UNDP 2006). Recent trends such as the privatization and monetization of water entitlements appears to have made water acquisition increasingly difficult for low-income women (Wallace and Coles 2005). Even in households with sufficient income to buy water, women's inability to control the household budget may put them at greater risk for experiencing water insecurity (Ray 2007). Thus, the impacts of water insecurity on women's health, wellbeing, and daily lives are harmful and pervasive.

While we know a great deal about women's water-related tribulations, we know much less about men's experiences. As Wallace and Coles (2005) noted in their review of the literature on water and gender, few studies delve into the gendered nature of social roles, responsibilities, and stressors. As a result, there is a great need for gender disaggregated data to answer questions about how water provision and insecurity impact men and women differentially (Ray 2007: 440-441). The goal of this study is to examine how gendered work, responsibilities, and concerns differentially shape how women and men experience water-related emotional distress. The analysis employs a multi-method approach, including qualitative and quantitative analyses. An important contribution of this study is that it uses randomly-selected pairs of male and female household heads to examine intrahousehold disparities in experiences of water insecurity and emotional distress.

Field Site

I conducted the field research in Cochabamba, Bolivia, a semi-arid city nestled in the eastern slopes of the Andes. As a major market center, the city is economically active and attracts migrants from across the country. Residents of the city are of Quechua (49 percent), Mestizo (40 percent), and Aymara (10 percent) descent (CEDIB 2007a). Outside of Bolivia, Cochabamba is widely known as the site of the "Water War of 2000", a three-month period of unrest that erupted over the privatization of the municipal water system and the imposition of an unfair pricing structure on the municipality's poorest residents (Assies 2003). Although control of water resources has since returned to municipal authority, inequities in water distribution persist. Approximately 30 percent of the population, mainly impoverished residents of Districts

7, 8, 9, and 14 on Cochabamba's south side, does not have access to municipal water systems (CEDIB 2007a). Because there are few viable alternative sources of water in this region, water insecurity is one of the most common problems that south side residents face (Antequera Durán 2007).

District 9 (population 46,268), the site of this study, contains predominately indigenous Quechua residents, many of whom have recently migrated to the city. Most residents work in low income economic sectors; women tend to work in the service sector (37 percent) while men work principally (30 percent) in industry (CEDIB 2007b). Although the majority of District 9 residents (73 percent) are homeowners, many of the homes (67 percent) are in poor condition (CEDIB 2007b). Water insecurity is a particularly challenging problem for residents of District 9, as 49 percent of households lack adequate water access and 81 percent lack adequate sanitation (CEDIB 2007b). As a result, residents report a high incidence of water-related problems such as difficulty acquiring water, water-related illnesses, and environmental pollution (Ledo García 2005).

This study examines experiences of water insecurity and emotional distress in Villa Israel, a neighborhood located at the far southern end of Cochabamba's District 9. Villa Israel was founded approximately 20 years ago, mainly by Quechua miners displaced by the collapse of the Bolivian mining industry in the 1980s. Established as a squatter settlement, the community has obtained electric and telephone service, bus and taxi-trufi service, two schools, and a health clinic. Despite these advances, Villa Israel has no access to the municipal water system. As a result, Villa Israel residents must gather water from multiple sources.

Annually, 100 percent of households purchase water from vending trucks for 4 bolivianos (\$0.50) per 200 liters. These trucks, which are operated by unionized vendors who obtain water far outside the community, circulate irregularly and carry only 10,000 liters of water—an insufficient quantity to satisfy community demand on any given day. The community owns and operates a tapstand system (see Author 2009a for a detailed analysis); water service is available to households that contain a qualified community resident. Each tapstand is opened just once a day and yields a maximum of 40 liters of water per household, enough to meet drinking and cooking requirements. Since beneficiaries must pay a monthly fee and wait long hours to acquire water, fewer than 40 percent of households regularly use the tapstand system. People also use supplemental water sources such as reciprocal water exchanges (37 percent of households), rainwater (69 percent of households), and a seasonal creek (11 percent of households). When rain and creek water are available during the wet season, people continue to use the other water sources but tend to obtain smaller proportions of their household water supply from them. Year-round, nearly 75 percent of households are unable to obtain 50 liters of water per person per day (Author 2006), the minimum international water provision standard (Gleick 2004). As a result, water acquisition and scarcity are major household stressors in Villa Israel.

Water governance in Villa Israel has traditionally been controlled by men, although women did hold a minority of community council seats during the period this fieldwork was conducted. Community labor projects—in which wells, waterways, or tapstands were built and maintained—were executed jointly by men and women. Additionally, women employed by Bolivia's PLANE (National Plan for Emergency Employment) program oversaw and executed

some water projects, such as the construction of a series of canals designed to channel storm water safely through the community. Similarly, although a male elder always held the position of official community tapstand monitor, women informally monitored water distribution and rule enforcement at each of the community's tapstands. In a variety of realms, women's expertise in water issues was recognized and played a vital role in community water governance. Even so, men clearly had more power and responsibility for water decision-making. The analysis I undertake here will explore the extent to which similar disparities in water acquisition and management exist at the intrahousehold level and what effects they have, if any, on women and men's experiences of water insecurity and emotional distress.

Field Methods

During the initial phases of the fieldwork, I presented the research design to Villa Israel residents at several community meetings. I obtained approval from the Villa Israel *Junta Vecinal* (Neighborhood Council) after household representatives voted to participate in the study. As a precondition for their participation, the community requested that I use their real name—Villa Israel—in publications resulting from the study. Villa Israel residents wanted to ensure that readers would learn of their struggles to obtain safe and secure access to water.

The fieldwork began with five months of participant-observation conducted in Villa Israel during the dry season of 2003 and the wet season of 2004. As a participant-observer, I occupied a gender position that was not clearly aligned with women or men. As an unmarried childless woman, I had few of the skills, accomplishments, or experiences that were common among Villa Israel women. As a college-educated foreign professional, Villa Israel men invited me to participate more actively in governance and water management activities than other women. My access to and rapport with both genders, while imperfect, was more equitable than it might have been if I fit local gender roles more comfortably. In participant-observation with men and women, I documented people's difficulties obtaining safe and adequate drinking water. I developed a series of questions about experiences of water insecurity and emotional distress that reflected native constructs (Author 2006: 134-135). Along with four Bolivian colleagues, I translated, pre-tested, and revised the protocol in Spanish and Quechua. We also used cognitive interviewing techniques to pretest the protocol with key informants.

Using a map of 425 residences as a sampling frame, I drew a simple random sample of 96 households. After we completed the informed consent procedures (approved by the Institutional Review Board of the University of Florida), 73 households (76 percent) agreed to participate in the study. Of the households we contacted, 73 (76 percent) participated in the study. For this analysis, I focus only on the subset of 24 households that contained a female and male "household head", defined as a person responsible for the acquisition and distribution of household goods. In total, 48 household heads participated in the interviews analyzed here. The purpose of focusing on matched pairs of household heads is to compare women and men who are exposed to the same household-level conditions of water insecurity. Table 1 contains the characteristics of the complete random sample and the matched pairs subsample. The subsample is similar to the complete sample on nearly all socio-economic indicators; the only major difference is in household structure (e.g., the proportion of single parents or income-earners), as would be expected based on the selection criterion for the matched pairs subsample.

We conducted four ethnographic interviews with each respondent at two-month intervals between June 2004 and January 2005. We asked respondents closed-ended questions about their experiences of water insecurity and emotional distress during the last week (e.g., “In the last week, did you get angry about water scarcity?”). As a follow-up, we asked respondents a series of open-ended questions (e.g., “Tell me more about what happened when you got angry about water scarcity last week.”) that yielded narrative data. Men and women were interviewed separately at their home or workplace. We conducted interviews in the language requested by the respondent, Spanish (94%) or Quechua (6%). To ensure that respondents felt comfortable, we assigned interviewers by gender unless respondents had a preference for a specific interviewer. In each interview, a secondary researcher recorded the narratives. Interviews took an average of 65 minutes to complete.

Data Analysis

The data analysis included quantitative and qualitative components. Quantitative methods enable me to provide an estimate of the prevalence of water insecurity and emotional distress in the study population. Qualitative methods allow me to explore the meaning, context, and variation in people’s experiences. Using mixed methods, I am able to present an analysis that offers some of the strengths of both approaches.

For the quantitative analysis, I examined participants’ responses to binary (yes/no) survey questions about water insecurity and emotional distress. For each question, I calculated the number of times that each respondent answered ‘yes’ on average over the four survey periods. This approach has the advantage of representing women and men’s experiences over the wet-to-dry season cycle, rather than providing a seasonal snapshot of experience. A potential drawback is that it may obscure seasonal variations. Cronbach’s alpha scores indicate that there was little seasonal variation in worry ($\alpha=.73$) and fear ($\alpha=.71$), but there may be more seasonal variation in annoyance ($\alpha=.52$) and anger ($\alpha=.37$). To verify that water insecurity and emotional distress are interrelated, I performed a Spearman correlation between a water insecurity scale (Hadley and Author 2009) and a scale of water-related emotional distress (Author and Ragsdale 2008). The correlation was $r=.67$ ($p<.0005$), indicating a large and highly significant relationship. In the analyses presented here, I used the Wilcoxon Signed Rank test, a non-parametric test of the difference between two matched groups, to compare scores across survey questions for women and men living in the same household.

For the qualitative analysis, I examined field notes and interview narratives. I used field notes to provide context for the analysis of intrahousehold gender relations. I used the interview narratives to examine variation in gendered experiences of water insecurity and emotional distress. Using the constant comparative method (Boeije 2002), I made systematic comparisons between (1) female and male respondents’ narratives *within* households and (2) paired female-male narratives *across* households. The analysis focused on the effects of gender roles on experiences of water insecurity and emotional distress. I present the results in summaries of findings and verbatim quotes from female-male pairs. Discussion of the narratives is interwoven with presentation of survey results below.

Results

Women and Men's Experiences of Water Insecurity

Water insecurity is a major stressor for people in Villa Israel and affects their lives in a number of ways. In participant-observation and early unstructured interviews, I identified fourteen experiences that Villa Israel residents commonly mentioned as indicators of water insecurity. I classify these in five broad categories: wasting time, last-ditch attempts to buy water, losing income, cutting back on water use, and running out of water. Results of comparisons between men and women's experiences of water insecurity are displayed in Table 2.

As the survey results in Table 2 show, women were significantly more likely than men to report that they wasted time because of water scarcity and the water vendor. Water scarcity caused people to spend extra time on water-related tasks, such as waiting in line to get water at the tapstand each morning, walking long distances to wash in the creek each week, or searching for a water vendor when their water provisions run low. In some ethnographic contexts, spending large amounts of time acquiring water might be considered normal or merely bothersome. In Villa Israel, however, people generally work up to 14 hours a day as they struggle to survive in unpredictable low-income informal sector employment. Given the time crunch that is a regular part of daily life, time lost to water insecurity can mean that someone misses work, skips a meal, is unable to tend to children, or loses sleep. In a typical narrative, one woman said that acquiring water was "exhausting because I have to get up at 4 am" to wait for the local tapstand to be opened. Although her husband observed that acquiring water "is always annoying because you have to be on the look-out constantly" for the vendor and tapstand monitor, he did not report that this affected his daily schedule. While both men and women recognized that water supplies are inadequate and difficult to access, the burdens of acquiring water had a greater impact on women's daily schedules.

In the survey results, there was no significant difference in men and women's last-ditch attempts to acquire water. The most common of these was making a last-ditch attempt to buy water from a water vendor. Water vendors in Villa Israel preferred to sell their loads to large-scale buyers who bought once a month (e.g., 2,000-10,000 liters) and avoided making sales to people who only had enough money or storage capacity to buy small quantities of water (e.g., 200-400 liters) a few times a week. In order to buy water, members of these households had to physically run down the street after evasive vendors and beg them to sell water to their families. Multiple household members often ran in opposite directions in an attempt to entrap a water vendor. As one woman explained, "the vendor does not listen when we call him and just drives away"; her husband added that it is necessary to chase and "search for the vendor, because if we do not, he will not come." In narratives, women and men both mentioned that chasing and begging water vendors were stressful and degrading experiences.

People that were unable to acquire water sometimes lost income because they lacked water to cook, mix cement, or engage in other productive activities. As the survey results show, women reported that they lost income significantly more frequently than men due to water scarcity and time wasted. A laundress explained that she lost income because "I did not have

enough water to wash laundry” for a regular client. Because women tended to work in jobs where they could set their own schedules, such as market vending or taking in laundry, they often arrived late to work, or not at all, because of time wasted waiting for a water vendor. As a market woman said, “The water vender never showed up—there was no water. I wanted to go to [work at] the downtown market” but could not because she had to secure water for her family. In contrast, it was unusual for men to report that they lost income due to water issues because they generally worked in jobs with fixed schedules, such as construction or the taxi driver’s union, and could not arrive late. For instance, the husband of the market woman observed that, “the water vendor never comes quickly and there’s never time to go and pick up water from the tapstand,” but said that time spent seeking water did not affect his ability to earn income as a taxi driver.

Due to the ever-present threats associated with water insecurity, all but a handful of households in Villa Israel regularly cut back on water use to avoid running out of water. In the survey results, women were significantly more likely than men to report economizing water for bathing, cleaning house, washing clothes, and cooking. For instance, people normally used 9 liters of water for hygienic tasks, 7 liters for food preparation, and 26 liters for household chores each day (Author 2009b). To economize, people might reduce their daily water use to 3 liters for hygienic tasks or 5 liters for household chores. In narratives, women discussed water economization in more detail than men. For instance, one woman said “it’s dreadful how I have to cut back on water use” and explained how she had to economize water for cooking because she only had a 40-liter daily water allotment from the tapstand. Her husband spoke more generally, stating that economizing water is “something I always remind my children; it’s basically just a habit for us”. In their narratives about water use tasks, men seemed more aware of activities that impacted their personal hygiene or the cleanliness of their surroundings, such as bathing or house cleaning. In contrast, they were less aware of water economization for tasks such as laundry or cooking.

As water began to run out, households systematically cut water use tasks in order of their importance for survival (e.g., bathing was cut first, while cooking was cut last) (Hadley and Author 2009). Notably, in the survey results, there were no significant differences in women and men’s perceptions of their inability to bathe, wash clothes, or clean house. However, there were often incongruities in the details provided by men and women. For instance, one man explained that “for three days the water vendor did not come, and we only had the 40-liter tapstand allotment” to survive on; his wife’s perspective on the same incident was that “one day the water ran out and I could not cook” for the family. In the survey results, the only statistically significant difference was that women reported running out of water for cooking more frequently than men. In a number of households, women were responsible for preparing the family’s midday meal, while men ate their midday meal in the workplace. Women’s food provision responsibilities made them more knowledgeable about how water insecurity impacted family meals, while men’s food acquisition strategies appeared to buffer them from this knowledge.

Women and Men’s Experiences of Water-related Emotional Distress

Given the range of water-related stressors that people regularly experienced, expressions of emotional distress over water insecurity were very common in Villa Israel. This was apparent

from the earliest days of my fieldwork; when I told people I wanted to study water issues in the community, they often replied that water situation was *grave* (grievous). I began to record the various ways in which people talked about water-related emotional distress (see Table 3 for examples). The most common of these native categories were *preocupación* (worry), *miedo* (fear), *molestia* (bother or annoyance), *renegado* (angry), and *enojado con un familiar* (angry with a family member) (cf. Tapias 2006 for further discussion *renegar* and Ennis-McMillan 2006 for further discussion *molestia*). Indeed, these expressions were so common that all male and female respondents—with the exception of one water-secure couple—reported experiencing at least one negative emotion during the study. The native categories of emotional distress were then used as the basis for the survey comparisons presented in Table 4 and narrative analyses presented below.

Preocupación (worry) describes a persistent low-level manifestation of emotional distress. In the survey results, there was no significant difference in male and female household heads' reports of *preocupación* over water. Voicing a common viewpoint in Villa Israel, a young woman told me that, "Women worry more because we need water to wash [everything]; men don't worry because they hardly do anything at all—they just need water to bathe themselves." However, the interview narratives from pairs of female and male household heads indicated that gendered experiences of *preocupación* over water were more complex than this perspective suggests. It was common for women and men to voice similar *preocupaciones*, as exemplified by one couple's comments at the height of the dry season. The husband said, "I am worried about the wells" being exhausted, while his wife reiterated that she worried because "the water is about to run out."

Despite the prevalence of male-female pairs that expressed similar *preocupaciones* over water insecurity, there were some cases that highlighted differences between women and men. For instance, a mother who had recently moved to Villa Israel said, "Every day I worry about water and hope it does not run out" because "it's terrible to fill the water tank. Shouting for the water vendor and pleading with him [to sell water] is difficult." In comparison, her husband reported during the same time period that he did not feel worried because "we have not been buying water". When women expressed more *preocupación* over water than men, it was generally because they had more intimate or thorough knowledge about household water needs, acquisition, and use. Yet when men had direct knowledge of the household's water situation, they appeared to experience just as much *preocupación* over water as women—even if they were not primarily responsible for completing water use tasks.

Miedo (fear) is a more intense emotional response than *preocupación* and was often linked to an imminent water-related threat. The survey results indicate that women reported experiencing *miedo* significantly more often than men. This finding was supported by the narratives, in which women discussed feeling *miedo* more readily than men. For instance, an elderly shopkeeper told us that "the rainy season is over, that's why I am afraid about the water" situation. During the same interview cycle, her husband reported that he did not feel *miedo* because "we do not have any water-related problems whatsoever." While the family was not experiencing any water-related problems at the time, the female shopkeeper's response revealed sensitivity to anticipated water problems that her husband did not feel. The contrast between women and men's reports of water-related fears was not always so stark. In some cases, women

and men recognized similar water-related problems but expressed their feelings about those problems in distinct ways. In a typical example, one woman reported that she felt *miedo* because “I scrimped and saved on water use. But the water vendor never arrived, and I felt afraid” that the water would run out. Her husband explained that, while he did not feel *miedo*, “sometimes when there’s no work, you have to cut back on everything, including water.” In this case, the survey results clearly demonstrated that men were less likely to say they experienced *miedo* than women, but the narratives indicate that male and female household heads’ discussions of *miedo* delved into different aspects of fear, risk, and responsibility.

Molestia (bother or annoyance) refers to emotional distress over an unjust or objectionable aspect of water distribution or acquisition. In the survey results, there was no significant difference in male and female household heads’ tendency to report *molestia* over water issues. It was common for both male and female household heads to express *molestia* over the water vendor’s behavior, as in the case of a husband who said “I was annoyed because I had to search for the water vendor”, while his wife stated that “the water vendor said he would come ‘in a minute, just a minute’ and then disregarded me.” Beyond this, the narratives provided evidence that there was a qualitative difference in the emotional responses of male and female household heads. Male household heads’ discussions of *molestia* were focused on the water truck, although some men also made comments about injustices at the tapstand. In contrast, female household heads’ discussions of *molestia* focused on a range of interactions including conflicts at tapstand, borrowing water from neighbors, and washing at the creek (see Author and Ragsdale 2008 for examples). This is illustrated by the narratives of a retired pastor and his teenaged daughter, who helped him run the house while his wife worked long hours in the market. The pastor reported feeling *molestia* because “I had to wait for the water vendor and he didn’t come all day, not until the following day.” His daughter reported that she acquired water from additional sources, including the community tapstand and water loans from neighbors. Over three interviews, she repeatedly expressed *molestia* over her experiences: “I don’t like to go to the tapstand... it’s difficult to carry the water...my neighbor accused me of taking three buckets [more than a fair share]...I have other things to do in the morning; it’s a waste of time.” There was no significant difference in the prevalence of *molestia* in the survey results, but there was a tendency in the narratives for women to report *molestia* over a wider variety of water acquisition problems than men.

While people tended to feel *molestia* over structural inequities that cause water insecurity, they generally reported feeling *renegado* (angry) over a specific situation when it caused them to experience water scarcity. The survey results indicate that women reported feeling *renegada* significantly more often than men. Women reported that they felt *renegada* over incidents such as having to purchase water, waiting at the tapstand, and running out of water. Given that men reported feeling *renegado* only about half of the time that women did, men expressed their anger more vocally in the narrative responses than might be expected. Men regularly said they felt *renegado* over the poor service provided by the water vendor or because they ran out of water. As one man explained, “I get angry because the water vendors never show up anymore; I don’t know what their problem is.” Another trend in the narrative responses is illustrated by the comments of a couple who experienced different kinds of emotional distress when facing the same situation. The husband stated that “I was angry because we had no water” while his wife that “I was worried because the water was running out.” In response to the same

stressor, the man reported feeling *renegado* while the woman expressed *preocupación*. Men's relative willingness to talk about feeling *renegado* suggests that there were gendered norms influencing respondents' expression of emotional distress. If so, the narrative data do not clearly indicate whether this effect is related to men's comfort talking about feeling *renegado* or women's discomfort talking about feeling *renegada*.

Like *renegado*, *enojado* refers to anger, but the term was generally used in the context of being *enojado* with someone. Although I observed Villa Israel residents getting with angry with a range of people in the community, respondents were rarely willing (3 percent, on average) to report that they were angry with a non-family member. As a result, I focus on reports of feeling *enojado con un familiar* (angry with a family member) in this analysis. As the survey results show, there was no significant difference in women and men's reports of anger with family members over water. The behavior of young children was a common trigger for respondents' anger with family members. One father with young children said, "I am always angry because my kids waste water." The mother concurred, and gave an example: "I got angry because my son tipped over and spilled the boiled water—on purpose." While women were predominately responsible for child care and supervision, many men were actively involved in childrearing. Once children are toilet-trained (and make less dirty laundry), the water-related pressures they generate decrease dramatically. Older girls, in particular, often helped with household chores, lessening the burden on their parents. Until that time, household water tasks and children's misbehavior could provoke the anger of men and women. Spousal conflicts over water responsibilities were another common reason for feeling *enojado con un familiar*. Tensions often emerged when women and men blamed each other for running out of water. One couple, who both worked on the local taxi line, explained one such incident. The wife said she felt *enrojada* "with my husband because he didn't buy water and he didn't go out to look for the water vendor." He countered that "My wife didn't buy water and we argued because, as a result, I wasn't able to bathe. I got angry for this same reason." The bidirectional nature of spousal anger, along with men's moderate involvement in childrearing, explains why men and women had similar reports of feeling *enojado con un familiar*.

Discussion and Conclusions

The results of this study confirm past findings regarding gendered disparities in workloads generated by water insecurity. In Villa Israel, female household heads reported wasting time and losing income significantly more often than male household heads. Both of these outcomes support previous findings that water insecurity creates time poverty and economic hardship for women (UNDP 2006). Female household heads also reported cutting back on water use for cleaning, washing, cooking, and bathing more often than male household heads. The literature has long established that women have disproportionate responsibility for water-related housework (Ray 2007, Wallace and Cole 2005), and this was also clearly the case in Villa Israel. As a result, female household heads were much more knowledgeable about water budgeting and economization than male household heads.

This study's results also provide partial confirmation of past findings on gender disparities in water-related emotional distress. Female household heads in Villa Israel experienced significantly more water-related emotional distress than male household heads, particularly for more acute emotions like *miedo* (fear) and *renegado* (angry). As suggested by

previous research (Author and Ragsdale 2008, Ennis-McMillan 2006, 2001, Coêlho et al. 2004, Siddiqui and Pandey 2003), female household heads felt more emotional distress than male household heads because they had to work more to acquire water, had more responsibility for water use tasks and child supervision, and had more knowledge of water inadequacies than men. One noteworthy trend in the narrative responses was that male household heads tapped into different aspects of experience than female household heads when they discussed feeling *miedo* and *renegado*. With regard to feeling *miedo*, men were more likely than women to express fears about their ability to provide for their families. With regard to feeling *renegado*, men were more vocal in their expressions of anger than women. Men also were more likely to express anger in response to incidents that caused women to report feeling worry or fear. These findings raise questions regarding the comparability of men and women's expression of emotional distress. As Ortiz-Hernández et al. (2007) recently suggested, women and men may express feelings of emotional distress over poverty in distinct ways. If so, future research could examine gendered idioms and expressions of emotional distress. Such research might yield very different findings from studies that use a standardized approach to compare men and women's responses to water insecurity.

Beyond its confirmation of past research, these findings contribute new insights into the role gender plays in shaping experiences of water insecurity. The most striking finding was the absence of significant differences in male and female household heads' experiences in emergency water situations, such as running out of water and making last-ditch attempts to buy water. Although male household heads were less aware of everyday measures taken to conserve water, they were as likely as female household heads to recognize when the household ran out of water. When they urgently needed water, male household heads also participated alongside female household heads in chasing water vendors and begging them to sell water. Begging is a common negotiation strategy in Cochabamba (Author 2006), and my observations in non-water contexts indicated that women were more likely than men to negotiate by begging. In the water context, however, male household heads were as likely as female household heads to beg water vendors to sell them water. This seems to suggest that, under conditions of severe resource pressure, gendered realms of knowledge and divisions of labor may become more fluid as household heads struggle to ensure that their dependents survive. This finding is somewhat unexpected, as several scholars have noted in the food insecurity literature that women are more likely than men to eat socially unacceptable foods or engage in stigmatized food acquisition strategies (cf. Coates et al. 2006). Future research should examine how different levels of water insecurity shape gendered norms—and how this varies across socio-cultural contexts. The relatively equitable gender relations in Cochabamba, when compared with other water-scarce contexts, may explain why gender norms became more flexible during water emergencies in Villa Israel.

These results also contribute new insights regarding the role gender plays in shaping water-related emotional distress. This study's findings indicate that household resource insecurity does have a considerable emotional impact on men. Male household heads in Villa Israel were as likely as female household heads to report feeling *preocupación* (worry), *molestia* (bother or annoyance), and *enojado con un familiar* (angry with a family member). This result may reflect the reality that male household heads in Villa Israel did have substantial responsibilities for household water acquisition and childcare. In contrast to other field settings, in which fetching water from wells and tapstands is considered "women's work" (Ray 2007),

men in Villa Israel regularly worked to ensure that their families had enough water to survive. Additionally, men's awareness of household water shortages likely contributed to their feelings of emotional distress. One unexplored area of the literature on gender, resource insecurity, and emotional distress is how men's roles as breadwinners and community leaders affect their feelings of guilt and anguish over their family's suffering. While responsibilities for income provision were not systematically explored in this study, some of the men's narratives indicated that income provision might play an important role in their feelings of emotional distress. It is also noteworthy that the only acute emotion for which male household heads expressed distress on par with female household heads was anger with a family member. Men's anger at family members often focused on their perceptions that their wives and children did not behave responsibly in using and conserving water. Another interesting area for future work might be to examine how feelings of guilt and blame play out in male and female household heads' responses to resource insecurity. As with this study's results regarding fear and anger, these findings raise new questions about differences in how men and women differentially experience emotional distress over water insecurity.

Several limitations should be considered when interpreting this study's findings. First, men may be more likely than women to underreport symptoms of psychosocial distress due to gender role socialization (Sigmon et al. 2005). While male participants in this study reported a higher degree of emotional distress than expected, it is also possible that the results underestimate the respondents' true experiences of emotional distress. Second, the relatively small sample size ($n=48$) increases the likelihood of a Type II error—that is, not detecting a real difference due to the low power of the test. Indeed, the relatively large but statistically insignificant differences between women and men on some measures suggest that a larger sample may have yielded more significant differences. Even so, the qualitative analyses provided a convincing cross-check on the quantitative findings. Third, this paper follows Pike and Williams (2006), Tapias (2006), Ennis-McMillan (2001), and other anthropologists by using native constructs and terminology to explore emotional distress. The drawback of this approach is that it does not provide results that are directly comparable across cultures. However, this approach has the advantage of systematically exploring respondents' perspectives using their own constructs and language. Finally, this analysis has the limitation of dealing with a sample comprising male and female household heads only; single household heads and other household members were excluded. While the study captures the experiences of those most responsible for household survival, the results cannot be generalized to other household members.

Despite these limitations, this research makes an important contribution to the growing literature on resource insecurity, mental health, and gender. Past research indicates that women are more at risk for suffering water-related emotional distress, anxiety, and depression than men. This study contributes to this literature by making systematic comparisons of men and women's experiences of water insecurity and emotional distress in a water-scarce Bolivian squatter settlement. In doing so, it goes beyond the conventional emphasis on the suffering of women and girls, and provides more nuanced information about the experiences of men in water-poor environments. The results indicate that, while women were more burdened with everyday water responsibilities, men and women were equally involved in and aware of emergency water situations. This finding suggests that gender norms may become more flexible in times of severe resource scarcity. Further, the results indicate that, although women were more likely to report

feeling fear and anger, men and women were equally likely to report feeling worry, annoyance, and anger at a family member as a result of water insecurity. These results suggest that men do experience considerable emotional distress related to water insecurity, but also raise questions about the comparability of men and women's expressions of emotional distress. Future studies should explore gendered idioms and experiences of emotional distress over water insecurity, enriching our understanding of the link between resource insecurity, mental wellbeing, and gender.

Notes

Acknowledgements

This research was supported by the National Science Foundation (Award BCS-0314395), Fulbright-IIE, the Tinker Foundation, and Paul and Polly Doughty. I am grateful to my colleagues Kathleen Ragsdale, Wilda Valencia, Richard Aguilar, Wilfredo Valencia, and Dominga Choque for their insights on this project.

Works Cited

Antequera Durán, Nelson

2007 Territorios Urbanos: Diversidad cultural, dinámica socio económica y procesos de crecimiento urbano en la zona sur de Cochabamba. Cochabamba: CEDIB/Plural.

Assies, Willem

2003 David versus Goliath in Cochabamba: Water Rights, Neoliberalism, and the Revival of Social Protest in Bolivia. *Latin American Perspectives*. 130(30):14-36.

Boeije, Hennie

2002 A Purposeful Approach to the Constant Comparative Method in the Analysis of Qualitative Interviews. *Quality & Quantity* 36:391-409.

Centro de Documentación e Información Bolivia (CEDIB)

2007a Datos de la Zona Sur, Cochabamba. Cochabamba: CEDIB.

2007b Datos del Distrito 9, Cochabamba. Cochabamba: CEDIB.

Coates, Jennifer, Edward Frongillo, Beatrice Rogers, Patrick Webb, Parke Wilde, and Robert Houser

2006 Commonalities in the experience of household food insecurity across cultures: what are measures missing? *Journal of Nutrition* 136(5):1438S-1448S.

Coêlho, Angela, John Adair, and Jane Mocellin

2004 Psychological Responses to Drought in Northeastern Brazil. *Revista Interamericana de Psicología* 38(1):95-103.

Ennis-McMillan, Michael

2001 Suffering from Water: Social origins of body distress in a Mexican community. *Medical Anthropology Quarterly* 15(3):368-390.

2006 *A Precious Liquid: Drinking Water and Culture in the Valley of Mexico*. Belmont: Thomson Wadsworth.

Gleick, Peter

2004 *The World's Water 2004-2005*. Washington, D.C.: Island Press.

Gorn, Shoshana, Marcela Sainz, and Elena Icaza

2005 Variables demográficas asociadas con la depresión: diferencias entre hombres y mujeres que habitan en zonas urbanas de bajos ingresos. *Salud Mental* 28(6):33-40.

Hadley, Craig, David Lindstrom, Fasil Tessema, and Tefara Belachew

2008 Gender bias in the food insecurity experience of Ethiopian adolescents. *Social Science & Medicine* 66:427-438.

Hadley, Craig and Crystal Patil

2006 Food insecurity in rural Tanzania is associated with maternal anxiety and depression. *American Journal of Human Biology* 18(3):359-68.

Hadley, Craig and Author

2009 Experience-based measures of food and water security: Biocultural approaches to grounded measures of insecurity. *Human Organization* 68(3): in press.

Kleinman, Arthur, Veena Das, and Margaret Lock, eds.

1997 *Social Suffering*. Berkeley: University of California Press.

Ledo García, Carmen

2005 Agua potable a nivel de hogares con una dimensión de género: derecho de las mujeres al agua en las ciudades de El Alto, La Paz, y Cochabamba. Cochabamba: CEPLAG.

Ortiz-Hernández, Luis, Sergio López-Moreno, and Guilherme Borges

2007 Desigualdad socioeconómica y salud mental: revisión de la literatura latinoamericana.

- Cadernos de Saúde Pública 23(6):1255-1272.
- Page, Ben
1996 Taking the strain—the ergonomics of water carrying. *Waterlines* 14:29–31
- Patel, Vikram
2007 Mental health in low- and middle-income countries. *British Medical Bulletin* 81/82:81–96.
- Patel, Vikram and Arthur Kleinman
2003 Poverty and common mental disorders in developing countries. *Bulletin of the World Health Organization* 81(8):609–615.
- Pike, Ivy
2004 The Biosocial Consequences of Life on the Run: A Case Study from Turkana District, Kenya. *Human Organization* 63(2):221-235.
- Pike, Ivy and Sharon Williams
2006 Incorporating psychosocial health into biocultural models: Preliminary findings from Turkana women of Kenya. *American Journal of Human Biology* 18(6):729-740.
- Poblete, Fernando, Sapag, Jaime, and Bossert, Thomas
2008 Capital social y salud mental en comunidades urbanas de nivel socioeconómico bajo, en Santiago, Chile. *Nuevas formas de entender la relación comunidad-salud. Revista médica de Chile* 136:230-239.
- Ray, Isha
2007 Women, Water, and Development. *Annual Review of Environment and Resources* 32:421-449.
- Rios, Jazmín, Fátima Palacios, Martha Gonzalez, and Maribel Sandoval
2003 Construcción de significados acerca de la salud mental en población adulta de una comunidad urbana marginal. *Salud Mental* 26(5):51-60.
- Siddiqui, Roomana and Janak Pandey
2003 Coping with environmental stressors by urban slum dwellers. *Environment and Behavior* 35(5): 589-604.
- Sigmon, Sandra, Jennifer Pells, Nina Boulard, Stacy Whitcomb-Smith, Teresa Edenfield, Barbara Hermann, Stephanie LaMattina, Janell Schartel, and Elizabeth Kubik
2005 Gender Differences in Self-Reports of Depression: The Response Bias Hypothesis Revisited. *Sex Roles* 53(5/6):401-411.
- Tapias, Maria
2006 Emotions and the Intergenerational Embodiment of Social Suffering in Rural Bolivia. *Medical Anthropology Quarterly* 20(3):399-415.
- United Nations
2002 UN Doc. E/C.12/2002/11, 20 January 2003, CESCR General Comment No. 15 on the right to water (ICESCR, Articles 11–12), paragraph 49.
- United Nations Development Program (UNDP)
2006 *Beyond scarcity: power, poverty and the global water crisis*. New York: UNDP.
- United Nations Conference on Environment and Development (UNCED)
1992 *Agenda 21 of the Rio Declaration on Environment and Development*. Rio de Janeiro: Earth Summit.
- Wallace, Tina, and Anne Coles
2005 Water, Gender, and Development: An Introduction. *In Gender, Water and Development*. A. Coles and T. Wallace, eds. Pp. 1-20. Oxford: Berg.

World Health Organization (WHO)

1992 The ICD-10 classification of mental and behavioural disorders. Geneva: WHO..

World Meteorological Organization (WMO)

1992 Dublin Statement on Water and Sustainable Development. Dublin: International Conference on Water and the Environment.

Author

2006 The Effects of Urban Water Scarcity on Reciprocity and Sociability in Cochabamba, Bolivia. Ph.D. Dissertation. Gainesville: University of Florida.

2009a Water Scarcity and the Sustainability of a Common Pool Resource Institution in the Urban Andes. *Human Ecology* 37(2):179-192.

2009b Estimating Household Water Use: A Comparison of Diary, Prompted Recall, and Free Recall Methods. *Field Methods* 21(1):49-68.

Author and Kathleen Ragsdale

2008 Water Insecurity and Emotional Distress: Coping with supply, access, and seasonal variability of water in a Bolivian squatter settlement. *Social Science & Medicine* 67:2116-2125.

Zamani, Gh., Marjan Gorgievski-Duijvesteijn, and Kiumars Zarafshani

2006 Coping with Drought: Towards a Multilevel Understanding Based on Conservation of Resources Theory. *Human Ecology* 34:677-692.

Tables

Table 1

Comparison of Household Characteristics for a Random Sample and a Matched Pairs Subsample in Villa Israel

Randomly Sampled Households (n=72)		Matched Pairs Subsample (n=24)	
Household Characteristics	Value	Household Characteristics	Value
Mean income level (four-point scale)	2.7 (SD 0.9)	Mean income level (four-point scale)	2.8 (SD 0.8)
Mean water use (liters/person/day)	32.9 (SD 18.3)	Mean water use (liters/person/day)	32.4 (SD 15.9)
Renters	20 percent	Renters	21 percent
Homeowners (self or family member)	80 percent	Homeowners (self or family member)	79 percent
Mean household size	5.1 (SD 2.0)	Mean household size	5.1 (SD 2.1)
One income-earner	55 percent	One income-earner	33 percent
Two income-earners	22 percent	Two income-earners	38 percent
Home-based industry is main income source	12 percent	Home-based industry is main income source	25 percent
Remittances are main income source	11 percent	Remittances are main income source	4 percent
Primarily Quechua speakers	9 percent	Primarily Quechua speakers	6 percent

Table 2

Percentage of women and men who reported stressful water-related experiences over four seasonal interviews

	Women	Men	Sig.
<i>Wasting time</i>			
Wasted time due to water scarcity	51	22	***
Wasted time due to the water vendor	42	19	*
<i>Last-ditch attempts to buy water</i>			
Running after a vendor to buy water	52	32	NS
Begging a vendor to sell water	49	34	NS
<i>Losing income</i>			
Lost income due to water scarcity	19	02	**
Lost income due to time wasted chasing vendor	17	04	*
<i>Cutting back on water use</i>			
Economize water to bathe	80	55	*
Economize water to clean house	74	51	*
Economize water to wash clothes	73	43	**
Economize water to cook	54	29	**
<i>Running out of water</i>			
Unable to bathe	32	27	NS
Unable to wash clothes	23	22	NS
Unable to clean house	22	16	NS
Unable to cook	16	02	*

Table 3

Common expressions of emotional distress over water scarcity in Villa Israel

Native concept (Spanish)	English translation
Preocupo cada día por falta del agua.	I worry every day about water scarcity.
Sentí miedo porque el agua iba a acabar.	I felt afraid the water was going to run out.
Me molesta conseguir el agua.	I feel annoyed about water acquisition.
Reniego por falta del agua.	I get angry about water scarcity.
Me enojé con [un familiar] por el agua.	I got angry with [a family member] about water.

Table 4

Percentage of women and men who expressed emotional distress over four seasonal interviews

	Women	Men	Sig.
Worry	65	49	NS
Fear	80	39	***
Annoyance	46	32	NS
Anger	51	25	***
Anger with family member	23	12	NS

Note to Tables 2 & 4: Significance is indicated by *** when $p \leq .001$, ** when $p \leq .01$, * when $p \leq .05$; NS indicates no significant difference.