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To Pay or Not to Pay:
Purchasing of Prescribed Government
Pharmaceuticals in Rural Mali

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TO PAY OR NOT TO PAY: PURCHASING OF PRESCRIBED GOVERNMENT PHARMACEUTICALS IN RURAL MALI

By

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ABSTRACT

TO PAY OR NOT TO PAY:
PURCHASING OF PRESCRIBED GOVERNMENT
PHARMACEUTICALS IN RURAL MALI

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Nearly 40 percent of the 370 patients surveyed at a government dispensary and a maternity ward in a rural town in Mali did not purchase the medications prescribed by government health workers. Using a social psychological model, this study addresses the question of what factors influence the purchasing behavior of people seeking treatment at the government facilities.

Using data disaggregated by gender, the study examines factors such as need (measured by the respondent's perceived severity and anxiety), perceived efficacy of the prescribed medication, financial means, perceived nature of an illness, the respondent's occupation, education, marital status, and the patient's age.

The analysis demonstrates five significant characteristics of females who did purchase the prescribed medication and six for males. Furthermore, the significant characteristics for females differ from those for males.

By understanding purchasing behavior, policy makers can incorporate the needs of particular groups to provide appropriate, accessible, and effective health care.

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INTRODUCTION

In Mali, as in many African nations, people use health care resources, including Islamic, traditional, and government,[1] simultaneously and sequentially for the same illness [1-3]. Traditional and Islamic medical systems often incorporate cash, barter, and in-kind payment schemes [4]. In Mali, government medicine is the only system under which people must use cash for purchasing medications. This thesis investigates under what circumstances people are willing[2] to purchase these pharmaceuticals. Using a social psychological framework, I examine individual purchasing behavior in rural Mali.

There is a dearth of literature on purchasing behavior in Africa. One focus of this extant research is on how indigenous beliefs about illness and medicine influence the usage of pharmaceuticals [1, 5]. Other literature focuses

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1. The term "government medicine" refers here to what is more commonly known as "Western" or "modern" medicine. I use the descriptive term here as this is the kind of medical treatment available through government programs.

2. There is an argument that it is not a question of a person being "willing" to pay for medications, but rather of a person being "able" to pay for medications [23]. This study uses the term "willing," although I recognize the possibility that it might be interchangeable with "able."

on pharmacy-based surveys and examines social psychological factors that influence pharmacy use [6, 7]. While this literature provides an understanding of purchasing behavior, it is does not examine additional important issues.

Pharmacy-based surveys cannot explain why nearly 40 percent of medications prescribed in a town in rural Mali were not purchased. In no study to my knowledge do researchers determine what percentage of medications prescribed by health workers are actually purchased. In Mali, as in many African settings, a patient must purchase the prescribed medications from privately owned and operated pharmacies located away from the health facility. Western researchers assume that once an individual reaches a government health facility, s/he has completed her/his task in health seeking. Without the necessary medications, however, a visit to the physician offers little promise for recovery. The question must be asked, therefore, under what conditions will a person seeking government treatment actually purchase that treatment? This research addresses that critical question.

Past research addressing both purchasing and health seeking behavior in Southern and Northern countries indicates that a combination of predisposing factors (personal or cultural characteristics or beliefs), enabling factors (accessibility and financial means), and need (perceived severity of illness) help determine a person's

use of health services. Based on this theoretical framework, I have devised a model of purchasing behavior of government pharmaceuticals in Mali. This model is explained and tested in the following sections.

THE RESEARCH SITE

Mali is a land-locked nation in the Sahel region of West Africa. It is situated between Mauritania, Algeria, Niger, Burkina Faso, the Ivory Coast, Guinea, and Senegal. The country is largely populated by the Mande (Bambara, Malinke, and Sarakole) people (50%). Other ethnic groups include Peul (17%), Voltaic (12%), Songhai (6%), and Tuareg and Moor (5%). The economy is largely supported by agricultural activities, which comprise 40% of the Gross Domestic Product (GDP). Agricultural products include millet, sorghum, corn, rice, livestock, sugar, cotton, peanuts, and tobacco. Industry, which comprises 19% of the GDP, includes food processing, textiles, cigarettes, fish processing, metalworking, light manufacturing, plastics, and beverage bottling. "Mali's per capita GDP of $300 places it among the world's 10 poorest nations" [8].

I conducted this research during the rainy season in the small urban center of Sansanding,[3] a district (*arrondisement*) capital in the Segou region of Mali. The town of Sansanding has a population of 10,094. Sansanding

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3. Sansanding is the French name. Those who live in the area refer to the town as *Sinzani*, meaning "little fence" in Bambara.

District, which covers 30 villages (including Sansanding), has a population of 29,842 and covers approximately 600 km^2. While some of the villages have retained their traditional religion, most villagers are Muslim. This is evidenced by the eight elaborate mosques in Sansanding proper.

Sansanding is comprised of several ethnic groups, including Bambara, Bozo, Fulani, Maraka, and Mossi. Bambara is the predominant language and is the language in which the interview team conducted interviews. The Bambara and Maraka people are traditionally farmers. The Fulani are herders, although they have begun to farm in Sansanding area. The Bozo are fishers and, with a few exceptions, do not farm. The Mossi live in one neighborhood (*quartier*) in Sansanding. Many of the Mossi men are marabouts.[4] They run a Koranic school and are very successful gardeners and farmers.

Bambara women participate in farming activities, unless there are enough workers to cultivate the fields without them. Women are responsible for many of the domestic chores required within their husbands' family compounds. Malian women often participate in market activities. Many are avid small-scale businesswomen.

Women are expected to bear many children. Men often view a woman's value as synonymous with her ability to produce children, particularly male children. A woman who

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4. Marabouts are Islamic healers who practice both divination and herbal treatment.

is unable to have a child often finds herself with a younger, more promising co-wife. Thus, Malian women take seriously their responsibility to produce children [1]. Women are the primary caretakers of their children and the adults in their immediate families. The responsibility for an ill child most often rests with the woman, although men may share in this responsibility.

Both women and men access health care in Sansanding. There are three main types of health care sought by villagers: government, traditional, and Islamic.

Government Facilities

There is one dispensary and one maternity ward in the town. While both serve the entire district, there is a second dispensary 16 kilometers away. I included only facilities based in Sansanding proper in the study. The dispensary is overseen by a head nurse (*Infirmière d'Etat*), who received three years of medical training upon completing the ninth grade. Also staffing the dispensary is a certified nurse (*Infirmière Certifié*) with a similar education and a nurse's aide (*Aide Soignant*), who completed a sixth grade education. These three health workers have similar responsibilities, which cover a wide range of health problems except those requiring surgery. Only the head and certified nurses are authorized to write prescriptions. All three nurses are male.

The maternity ward operates under the supervision of the head nurse at the dispensary. The head midwife (*Matrône*) finished fifth grade and has been working at the maternity ward since 1974. She is aided by a nurse/midwife (*Sage Femme*) whose education is similar to that of the head nurse at the dispensary. At the time of this research, there was a third health worker who had finished the ninth grade and then trained with the Red Cross for six months. She has since relocated. Finally, there is a traditional midwife who is unsalaried, has over 15 years of midwife experience, and has had no formal education. She is the only health worker at the maternity ward who does not write prescriptions.

The ratio of government health workers to villagers is approximately 1:4,000. This is high in comparison to the national average of 1:1,350 nurses to villagers [9].

While consultations with a health worker at a government health facility in Mali are free, patients pay for the prescribed medications in cash at one of the three local pharmacies. Pharmacies in Mali were previously operated by the government; however, the Malian pharmaceutical system was privatized in 1991. Two of the pharmacies are owned and staffed by the same villager and his family. The third is owned by a male villager who has hired a worker to staff the facility. The owners set the prices of the pharmaceuticals. These prices are based on

the price of pharmaceuticals in the capital city of Bamako. The cost of round-trip travel and the pharmacists' profits are added to the original cost.

Traditional Healers

There are at least 12 traditional healers in Sansanding proper and 34 in the surrounding villages. This offers a ratio of about 1:650 healers to villagers. Most healers have a specialty, including pediatrics, pulmonary, gastrointestinal, and orthopedic focuses. The three healers whom I interviewed as expert informants stated that it is common for people to pay what they are able; the healers never fix a price. Payment often comes in the form of cola nuts or small change (between 50-300 FCFA).[5] Many healers are farmers or fishers by trade and have learned their healing professions from family and village elders.

Islamic Healers

There are at least 29 marabouts in Sansanding proper and 13 in the remaining villages. This provides about a 1:715 ratio of marabouts to villagers. Marabouts heal many illnesses, both medical and psychological. People also visit marabouts to resolve problems related to marriage, finances, employment, and travel. Twenty-four of the 29

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5. One U.S. dollar equals approximately 250 to 300 francs CFA (FCFA).

marabouts in Sansanding treat medical illnesses. Marabouts study for many years to learn their trade. Clients pay for treatment through bartering and in-kind methods, along with paying cash. Most marabouts are expensive, often requiring the client to supply sheep, chickens, cloth, and other costly items to complete the difficult task of resolving a problem.

METHODOLOGY

The research methodology included conducting interviews at the dispensary and maternity ward over a five-week period. This facility-based approach is limited in that it excludes people who seek help exclusively at traditional or Islamic healers or who do not seek any medical treatment. Additional facility-based and household surveys are needed to target these populations.

A team of five interviewers conducted a pre-test of the survey instrument over two days. The instrument was tested for clarity and appropriateness of language. Upon completion of the pre-test, the five interviewers surveyed all patients seeking medical treatment at either the dispensary or maternity ward during the five weeks. The interviewers questioned the patients prior to, and upon completion of, the patient-health worker consultation. The health worker filled out a pre-numbered prescription form for each respondent who required pharmaceuticals. Using carbon copies, the prescription forms were written in triplicate. The health worker retained one copy which I later collected. The remaining two copies were given to the patient; one for their records and one to be given to the

pharmacist. The interviewers recorded the prescription number on the interview sheet. When a patient went to fill a prescription at one of the pharmacies, the pharmacist collected the form and recorded the date of purchase, the medication purchased, and the total price paid. I then collected the prescription form. Using the number written on both the prescription and interview form, I was able to track whether or not the respondent had purchased the medications and how much they had paid. A sample size of 469 individuals was obtained. Only 370 of those cases received prescriptions. The additional 99 respondents were therefore excluded from the final analysis.

The pre-consultation survey instrument was an interview schedule that identified respondents' demographic characteristics, reasons for seeking medical treatment, anxiety about and perceived level of the severity of the illness, previous treatment sought to cure the illness, the costs of that treatment, and how they accessed money to pay for that treatment. The post-consultation survey instrument determined whether the patient had been given a prescription. It also assessed the respondent's satisfaction with the visit, whether the health worker explained the nature and severity of the diagnosed illness, and whether the respondent had a new level of anxiety and perceived severity of the illness based on the health worker's information.

In addition to conducting these surveys, I consulted with expert informants in the area. These included traditional, Islamic, and government health care professionals and government health officials. These consultations provide insight into the scope and natures of the different medical systems.

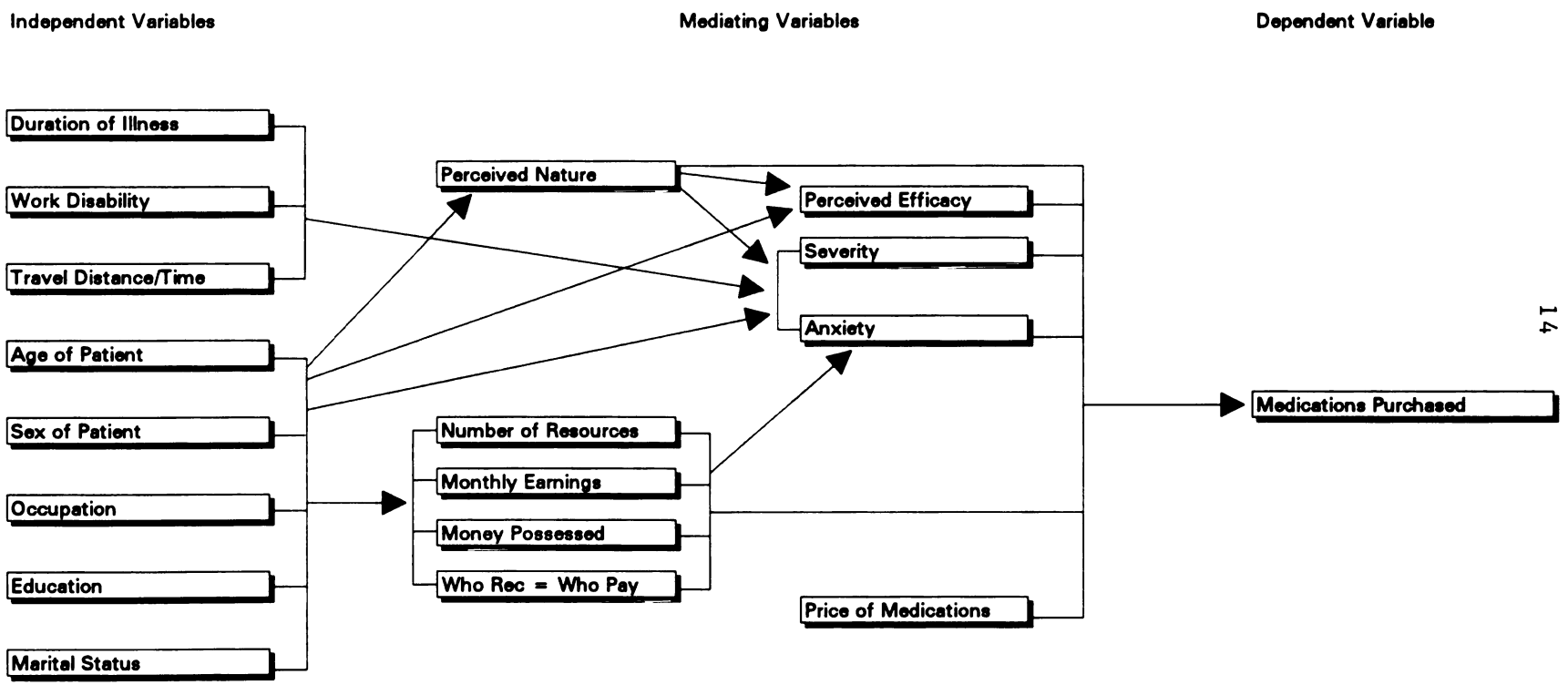
DESCRIPTION OF THE MODEL

The analysis of whether people are willing to pay for government medicine is based on the theoretical model illustrated in Figure 1. The model is based on previous models of health seeking and purchasing behavior used both in the North and South [7, 10-11]. Past research on the use and purchasing of medications in Africa focuses on socioeconomic factors, accessibility to facilities, and indigenous belief systems [1, 3, 7]. Researchers in the North have focused on factors such as the health seeker's perceived severity level of the illness [11-14].

The model incorporates many of the variables that affect purchasing behavior. For lack of space, I have excluded many variables, such as previous treatment sought during the same illness episode and how the network of polygamous family structures affect purchasing behavior. I recognize, however, that these variables are valuable in fully understanding this behavior. For this analysis, I chose variables that research from the South and North finds to be most salient.

The dependent variable, *medications purchased*, measures purchasing behavior of the health seeker. It demonstrates

Figure 1. Model of Purchasing Behavior of Presecribed Government Pharmaceuticals



whether the health seeker purchased the medications prescribed to her/him. Variables that directly influence this dependent variable are mediating variables. The independent variables directly affect the mediating variables, which, in turn, affect the dependent variable.

Mediating Variables[6]

The first mediating variable is the respondent's *perceived efficacy* of government medicine. Studies examining patients' compliance with drug treatment have shown that the patient's perception of how efficacious a medication is influences her/his decision to participate in that therapy [13, 15]. The same is true for purchasing behavior. If a person does not believe the medication will cure her/his illness, then s/he will be less inclined to purchase that medication. Adekunle [16] found this in her research on child immunization in Nigeria. Mothers are more likely to immunize their children if they believe that the vaccine will protect them.

The second variable is the respondent's *perceived level of severity* of her/his illness or of the illness of the child patient. If a person perceives her/his illness as life threatening or debilitating, s/he will do whatever possible to be cured, even if it requires borrowing money or

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6. These variables are not discussed in order of saliency. I have not ranked the variables because I do not have a hypothesis of one being more salient than another.

going into debt. Conversely, if a person does not perceive an illness to be very serious, s/he will not vigorously pursue its treatment. The *anxiety level* of a patient also affects purchasing behavior. An individual develops a certain level of stress or anxiety level around their particular illness.

I am not implying here that villagers in Sansanding chose government medical treatment over traditional or Islamic because that is where they chose to go for more serious illnesses. Rather, for those who do access government medical treatment, respondents with higher levels of anxiety and perceived severity will be more likely to purchase the medications. Healers are not arranged on some linear continuum from non-serious to serious conditions. Many Africans believe certain illnesses to be the within the domains of particular healers. Illnesses with supernatural causes, for example, are best treated by a traditional or religious healer [1, 2, 17-18].

A third mediating variable is the individual's *perceived nature* of the illness. How a person conceptualizes and defines the illness or symptoms will influence the decision to purchase the prescribed medications. As stated previously, when presented with multiple medical systems, many Africans choose health care based on their beliefs of the etiology of that illness (e.g., natural or supernatural) [1, 2, 17-18]. The

perceived nature of the illness in this model examines whether there are particular illnesses for which villagers are more or less likely to purchase pharmaceuticals.

How a person defines their illness will also influence their anxiety level around that illness and their perceived severity level of that illness. For example, if a mother diagnoses her child with malaria, she may do so with the perception that malaria is a very serious illness. In that instance, she would not only be more likely to seek treatment, but she would also be more likely to buy the prescribed medications that resulted from her health seeking actions.

There are four mediating variables that comprise the means by which respondents pay for the prescribed medications. The first of these variables is the *number of resources* a person may access to pay for the pharmaceuticals. There is network of family and friends by which villagers in Sansanding accesses funds to help pay for medical (and other social) needs. By using this network, people are able to access funds. The greater number of resources available to a respondent, the higher the likelihood s/he will purchase the medications.

The second variable in this group is the respondent's *monthly earnings*. With a greater monthly income, individuals or family units have more cash available to them. Monthly earnings positively influences purchasing

behavior of pharmaceuticals.

The amount of money a person possesses (*money possessed*) at the time of the interview is also an important contributor to purchasing behavior. A person who possesses the necessary funds with which to purchase the prescribed medications is more likely to make that purchase. A person with enough cash at her/his disposal does not need to look for additional means of financing the medications.

"*Whorec=whopay*" is an abbreviation for whether or not the person who recommended the respondent to the facility is also the person who is going to purchase the medications. For example, if a man recommends his wife to take their sick child to the dispensary and he says he will pay for the medications, then she is more likely to purchase those medications. If a woman takes her sick child to the dispensary without her husband's knowledge and assumes that he will pay, there is no guarantee that he will give her money to purchase the medications.

The final mediating variable is the actual *price of the medications*. The higher the price of medications, the lower

the chances of purchasing the medications.[7]

A lack of resources raises the respondent's anxiety level. A respondent who knows s/he cannot afford the prescribed medications, will have an increased level of anxiety. However, when money is not an issue, means does not influence the respondent's anxiety level.

Independent Variables

The *duration of the illness*, the number of days during a week that a patient cannot work due to the illness (*work inability*), and the *distance/time one has travelled* to seek help all have a positive relationship with perceived severity and anxiety. As the duration of the illness or the amount of work inability increases, so will the respondent's level of anxiety and perceived severity. Moreover, a person takes time to travel a longer distance or over a poorly paved road because they have higher levels of both anxiety and perceived severity.

The *age*, *gender*, *occupation*, and *education* level of the

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7. The pharmacists were asked to record the respondent number of anyone who asked the price of medications prior to purchasing them. Thus, if a person did not purchase the medications, the fact that they inquired could be factored into the analysis of purchasing behavior. Unfortunately, this information was not recorded uniformly. Often a pharmacist had a family member or employee staffing the pharmacy. This resulted in missing information. Moreover, determining the price of medications was difficult. Some medications were not available and pharmacists did not know their prices. There was also a wide range of prices for the same medication. Thus, the reliability of this variable may be in question.

respondent influence all of the mediating variables except for the price of the medication. *Age* has a negative relationship with perceived severity and anxiety. The younger the patient is, the greater the respondent's perceived severity and anxiety are expected to be. Moreover, age influences the perceived nature of an illness if that illness is associated with certain age groups, such as is chicken pox or measles. Age also influences the perceived efficacy of the medicine. Older, more traditional respondents may perceive traditional medicine to be more efficacious than government medicine. Finally, the age of the patient influences the means of payment for the medications. Older patients are predicted to have a larger social network and more access to finances. Therefore, they have a greater number of means.

Gender also influences the mediating variables. Past literature suggests that in cultures that place a higher value on male than female children, illnesses that affect boys create higher levels of perceived severity and anxiety [19-22]. Thus, perceived severity and anxiety levels will be higher for male than for female patients.

Gender influences the perceived nature of the illness and perceived efficacy of the medication. Fosu [17] found that women tend to perceive their illnesses as having more natural causes. Therefore, they use government medicine more frequently than men. Women perceive government

medicine to be more efficacious for their illnesses. They are, therefore, more likely than men to purchase the prescribed medications.

The *occupation*[8] of a respondent influences her/his perceived severity and anxiety levels when the illness is associated with a particular occupation. For example, many farmers work barefoot or wear footwear that does not protect their feet. Due to the nature of their work, many suffer open wounds from their various tools (e.g., hoes, plows, and livestock such as bulls). Farmers work in fields covered with manure. Thus, they may be more prone to open wound infections. A farmer who cuts a foot while working in the fields may be more worried, or perceive an open sore to be more severe, than would a person who works in a more protected environment, such as in a shop or office.

Occupation also influences the respondent's perceived nature of an illness. A modern professional, for example, may define her/his symptoms quite differently from someone in a traditional or agricultural occupation. In addition, someone who travels for business may acquire different beliefs about the etiology and nature of different maladies. This may not be true for a person who works at home.

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8. Occupation is divided into four categories: *No work* includes those who do not work; *domestic work* includes those who work in their compounds doing such tasks as cooking, cleaning, spinning, and odd jobs; *agricultural/traditional work* includes farmers, herders, and fishers; *modern work* includes such people as traders, drivers, civil servants, marabouts, pharmacists, teachers, and students.

Occupation also influences the way a respondent perceives the efficacy of medicines. A modern professional will perceive government medicine as more efficacious than will someone in a more traditional occupation. Moreover, occupation affects the means available to a respondent. Domestic workers, who do not formally work in the economic market, will have lower monthly earnings and less cash available than someone who works in the economic market. However, domestic workers will have the same amount of resources available within their network of family and friends.

Education[9] level and type (government, Islamic, or Koranic) affect the levels of perceived severity and anxiety of the respondent. A person has concern about an illness based on her/his knowledge of that illness. People's knowledge is gained from both cultural belief systems and formal education. Many education systems teach about the etiology and nature of disease. Thus, the perception a Koranic student may be different from that of a Madressa or government school student. Those who attend government schools have higher levels of perceived efficacy of

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9. Education includes three separate variables: the *government* system, based on the French system introduced during the colonial period and using French as the language of instruction; the *Madressa* system, which teaches similar subjects but in Arabic rather than French; and, *Koranic* education, which teaches students the Arabic prayers needed to be practicing Muslims. Frequently, students combine these systems, most often getting some Koranic education while also attending government or Madressa schools.

government medicine because they are exposed to the allopathic medical model on which government medicine is based.

Finally, the higher one's education, the more likely they will be to have a higher paying job. Such is the case with school teachers, traders, and civil servants.

Similarly, a respondent's *marital status* positively influences the number of resources available to that respondent. Being married increases the network from which an individual can draw funds. However, in a large family with many children, resources are diminished because many household expenditures compete for those resources. Marital status also affects monthly earnings, especially for women. Unmarried women often work in order to buy goods they will use after they marry. Once married, women are restricted by increased household responsibilities and children. Husbands also set rules about the work in which their wives may participate. These factors affect a woman's monthly earnings.

DESCRIPTION OF THE POPULATION

Table 1 gives statistics about the population who used the maternity ward and dispensary in Sansanding during the period studied. All respondents visiting the maternity ward were women. Of those visiting the dispensary, 179 were females and 122 were males. The average age of women visiting the maternity ward was 26 years. This is slightly younger than both females and males at the dispensary (30.5 and 35.3 years, respectively).

The patient population at the maternity ward was comprised of 52.5% females and 45.8% males. While 40% of the respondents were in childbearing years (16 to 30), all women who sought help for reproductive problems went to the dispensary. This is particularly interesting because the head nurse at the dispensary had specifically forbidden the maternity ward staff to treat patients with illnesses unrelated to reproductive issues. Despite this, nearly half of the illnesses seen at the maternity ward were malaria (42.4%). It is possible that the women who sought help at the maternity were pregnant at the time of their illness episode. Thus, they would be likely to visit the maternity ward.

Table 1. Description of User Population of Government Health Care in Sansanding*

	Female Respondents		Male Respondents	Total Population
	Maternity Ward (n = 59)	Dispensary (n = 179)	Dispensary (n = 122)	Maternity & Dispensary (n=370)
Respondent's Age (mean)	26 years	30.5 years	35.3 years	31.5 years
Patient's Age				
mean	19 years	18.8 years	15.9 years	17.9 years
newborn to 4 year old	22% (13)	34.6% (62)	36.1% (44)	32.4 (120)
5 to 15 year old	18.6% (11)	15.6% (28)	13.9% (17)	15.4 (57)
16 to 30 year old	39% (23)	30.7% (55)	27% (33)	30.8% (114)
31 years & older	18.6 (11)	15.6% (28)	18.9% (23)	17.6 (65)
missing	1.7% (1)	3.4% (6)	4.1% (5)	3.8% (14)
Gender of Patient				
Female	52.5% (31)	55.9% (100)	52.5% (64)	54.1% (200)
Male	45.8% (27)	38% (68)	43.4% (53)	41.1% (152)
missing	1.7% (1)	6.1% (11)	4.1% (5)	4.9% (18)
Respondent's Marital Status				
Married	71.2% (42)	82.7% (1148)	84.4% (103)	81.6% (302)
Not Married	28.8% (17)	16.8% (30)	15.6% (19)	18.1% (67)
Respondent's Average Level of Education				
Government	1 year	1.5 years	1.12 years	1.3 years
Madressa	1.5 years	.97 year	3.5 years	1.2 years
Koranic	3.7 years	3.7 years	1.4 years	3.6 years

Table 1. (continued)

	Female Respondents		Male Respondents	Total Population
	Maternity Ward	Dispensary	Dispensary	Maternity & Dispensary
Respondent's Occupation				
No Work	3.4% (2)	4.5% (8)	3.3% (4)	3.8% (14)
Domestic Work	37.3% (22)	56% (100)	45.9% (56)	49.5% (183)
Ag/Traditional Work	44.1% (26)	27% (49)	33.6% (41)	32.4% (120)
Modern Work	15.3% (9)	11.2% (20)	16.4% (20)	13.5% (50)
missing	0% (0)	1.1% (2)	0.8% (1)	.8% (3)
Respondents' Average Monthly Earnings	10,031 FCFA	8,613 FCFA	7,906 FCFA	8,536 FCFA
Respondent's Perceived Nature of the Illness				
Malaria	42.4% (25)	44.1% (79)	38.5% (47)	41.4% (153)
Digestive	8.5% (5)	12.8% (23)	12.3% (15)	11.9% (44)
Musculoskeletal	18.6% (11)	10.6% (19)	9.8% (12)	11.4% (42)
Skin Related	15.3% (9)	15.1% (27)	18.9% (23)	16.8% (62)
Female Reproduction	0% (0)	2.8% (5)	4. 9% (6)	3% (11)
Respiratory	6.8% (4)	5.6% (10)	4.9% (6)	5.4% (20)
Eyes and Ears	3.4% (2)	2.2% (4)	2.5% (3)	3% (11)
Other	1.7% (1)	5% (9)	5.7% (7)	4.9% (18)
missing	3.4% (2)	1.7% (3)	2.5% (3)	2.4% (9)
Respondent's Amount of Money Possessed (mean)	939 FCFA	1,165.5 FCFA	1,072.5 FCFA	1,081 FCFA
Respondent's Number of Resources (mean)	1	0.883	1	0.962
Average Price of Medications	1,794 FCFA	1,776 FCFA	1,744 FCFA	1,771 FCFA
Medications Purchased				
None	44.1% (26)	38% (68)	31.1% (38)	36.8% (136)
Some	20.3% (12)	24% (43)	23.8% (29)	23.2% (86)
All	32.2% (19)	30.2% (54)	36.9% (45)	33% (122)
missing	3.4% (2)	7.8% (14)	8.2% (10)	7% (26)

*There were 9 housecalls and 1 case missing that have not been included in these descriptive statistics.

At the dispensary, 55.9% of the patients visiting with female respondents were female; 38% were male. Similarly, 52.5% of the patients visiting with male respondents were female and 43.4% were male. Patients newborn to four years old was the largest age group represented for both female and male patients.

Seventy one percent of the female respondents at the maternity were married and over 80% of both female and male respondents at the dispensary were married. Years of government education were similar for both women and men. The average number of years in education system ranged from one to one and a half years. Male respondents had approximately two more years of Madressa education than female respondents, while female respondents had two more years of Koranic schooling on the average, than male respondents.

Female respondents at the maternity ward were mostly domestic or agricultural/traditional workers (37.3% and 44.1%, respectively). Over half the women and nearly half the men who visited the dispensary were domestic workers (56% and 45.8%, respectively).

Women who visited these facilities report larger monthly earnings, on the average, than men. This is not necessarily representative of the whole town of Sansanding. Because government medicine can only be purchased with cash, people with lower earnings may never reach these facilities.

It is still interesting, however, that women reported having higher monthly earnings.

Both female and male patients most commonly visit both facilities with a perceived diagnosis of malaria (around 43% for female patients and 38.5% for male patients). I conducted this research during the rainy season which is when malaria is most prevalent.

Respondents came to the facilities with an average of 1,771 FCFA available for purchasing the prescribed medications. This varied slightly from facility and by gender. The average price of medications was similar at each facility and by both genders (slightly higher than 1,700 FCFA). Respondents reported having an average of only one resource available from which they are able to access funds for purchasing the prescribed medications.

A slightly greater number of female respondents (44.1%) at the maternity ward did not purchase the prescribed medications than either female (38%) or male (31.1%) respondents at the dispensary. However, an equal portion of female and male respondents in both facilities purchased at least some or all of the medications.

FINDINGS

I analyze this data by gender of the patient.[10] My reasoning for disaggregating the sample is to explore differences in purchasing behavior between females and males. Each category includes patients of ranging from newborns to those over 65 years of age. I recognize that there may also be differences in purchasing behavior by different age groups. However, for this initial investigation, I have chosen to focus on gender.

Using both the significant betas and correlations, I have respecified the model of purchasing behavior for female and male patients. The betas show a causal relationship between the variables. I theorize the causality of the correlations.

Female Patients

The mediating variables in the model (Figure 1)

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10. While conducting interviews, we made the distinction between respondents and patients. However, to simplify the language of this discussion, I assume the respondents and patients to be one unit and refer to them as the "patient." My rationale for this assumption is that it is not the child patient who determines if the prescribed medications will be purchased. Rather, it is the combination of social psychological conditions of both the adult respondent the child patient that determine purchasing behavior.

explained a low 12.6% of the variance of purchasing behavior of government pharmaceuticals for female patients. By adding the independent variables to the equation, the variance explained nearly doubles (24%) (Table 2). The inability to work due to the illness (*Work Inability*) is the only significant predictor of purchasing behavior (beta = .236, $P < .05$). However, Table 3 illustrates that additional variables significantly correlate with purchasing behavior. There is a high degree of colinearity between some of these variables (*anxiety* and *work inability*, *anxiety* and *malaria*, and *money possessed* and *malaria*). This colinearity may prevent these variables from appearing as significant predictors of purchasing behavior.

The variance explained by the independent variables (Table 2) signifies that these variables have a direct influence on purchasing behavior. This is particularly evident because *work inability* (the inability of a patient to work during the illness episode) is the only significant indicator of purchasing behavior. In the original model, I hypothesized that work inability is a predictor of anxiety and perceived severity of an illness, which in turn predicts purchasing behavior. For female patients, however, while perceived severity and anxiety are significantly correlated with the inability to work due to an illness, the latter variable directly influences purchasing behavior. This indicates a problem of using a variable that is culturally

Table 2. Effects of Mediating and Independent Variables on Purchasing Behavior for Female Patients (regression of dependent variable on predictor variables)

	Mediating (n=200)	Independent (n=200)	Mediating & Independent (n=200)
Perceived Efficacy	o	x	o
Perceived Severity	o	x	o
Anxiety	o	x	o
Perceived Nature:			
malaria	o	x	o
digestive	o	x	o
eyes & ears	o	x	o
musculoskeletal	o	x	o
respiratory	o	x	o
skin	o	x	o
fem reproduction	x	x	o
Number of Resources	o	x	o
Monthly Earnings	o	x	o
Money Possessed	o	x	o
Whorec = Whopay	o	x	o
Price of Medications	o	x	o
Work Inability	x	*.236	o
Duration of Illness	x	o	o
Travel Time/Distance	x	o	o
Patient Age	x	o	o
Patient Gender	x	o	o
Marital Status	x	o	o
Occupation:			
no work	x	o	o
ag/traditional work	x	o	o
housework	x	o	o
modern work	x	o	o
Education:			
Government	x	o	o
Madressa	x	o	o
Koranic	x	o	o
R-Square	.126	0.112	0.24

o = in regression equation but insignificant

x = not in regresion equation

*sig. level .10 **sig, level .05 *** sig. level .005

Table 3. Effects of Mediating and Independent Variables on Purchasing Behavior for Female Patients (zero order correlations)

	Medications Purchased (n=200)	Perceived Severity (n=200)	Anxiety (n=200)	Malaria' (n=200)	Digestive' (n=200)
Perceived Efficacy		*-.105	*.101		
Perceived Severity			***.748		**.157
Anxiety	*.103	***.748		*-.094	
Perceived Nature:					
digestive		**.157		***-.381	
eyes & ears	*-.113			**-.153	
female reproduction		***.192	**.158	***-.211	*-.108
malaria	***.241		*-.094		***-.381
musculoskeletal		*-.106	**-.152	***-.275	**-.141
respiratory				***-.220	*-.114
skin	***-.202	**-.123		***.330	**-.170
Number of Resources			**.149	*-.094	
Monthly Earnings		*-.142	**-.161		
Money Possessed	*.102			***.234	**-.141
Whorec=Whopay					
Price of Medications					***-.230
Work Inability	**.221	***.403	***.403		
Duration of Illness		***.190	***.216		
Travel Time/Distance	***.208	**.163			
Patient Age		***.278	**.160	**-.155	**.135
Patient Gender					
Marital Status					
Occupation:					
no work		**.133			
ag/traditional work		**.133		*-.110	
domestic					
modern work		-0.137	**-.162		
Education:					
Government	**-.130	***-.207	*-.106		
Koranic					
Madressa				**.148	

'perceived illness

*sig. level .10 **sig. level .05 ***sig. level .005

Table 3. (continued)

	Musculoskeletal' (n=200)	Skin-Related' (n=200)	Female Reproduction' (n=200)	Respiratory' (n=200)	Eyes & Ears' (n=200)
Perceived Efficacy					
Perceived Severity	*.118	**.128	***-.212		
Anxiety	*-.106	**-.123	***.192		
	**-.152		**.158		
Perceived Nature:					
digestive					
eyes & ears	**-.141	**-.170	*-.108		
female reproduction					
malaria		*.192			
musculoskeletal	***-.275	***-.330	***-.211	***-.220	**-.153
respiratory		**-.122			
skin		*-.098			
	**-.122		*-.094	*-.098	
Number of Resources					
Monthly Earnings					*.109
Money Possessed					
Whorec=Whopay			**-.158		
Price of Medications					
					*.112
Work Inability					
Duration of Illness					
Travel Time/Distance			**.163		
			**.140		
Patient Age					
Patient Gender		**-.126	**-.145		
Marital Status					
	**-.118				
Occupation:					
no work					
ag/traditional work					
domestic	**.142				
modern work		*-.109			
	*-.093				
Education:					
Government					
Koranic					
Madressa		*.100			

'perceived illness

*sig. level .10 **sig. level .05 ***sig. level .005

Table 3. (continued)

	Number of Resources (n=200)	Monthly Earnings (n=200)	Money Possessed (n=200)	Whorec = Whopay (n=200)	Perceived Efficacy of Medications (n=200)
Perceived Efficacy					
Perceived Severity	***.223				***.223
Anxiety		*-.142			*-.105
	**.149	**-.161			*.101
Perceived Nature:					
digestive					
eyes & ears			**-.141		
female reproduction	*.109				
malaria			**-.158		***-.212
musculoskeletal	*-.094		***.234		
respiratory					
skin					
					**.128
Number of Resources					
Monthly Earnings			***-.249	**-.135	
Money Possessed			***.302		
Whorec=Whopay	***-.250	***.302			
Price of Medications	**-.135				
Work Inability					
Duration of Illness		**-.213			**.211
Travel Time/Distance	*.098		**-151		**-.159
Patient Age					
Patient Gender					***-.270
Marital Status					
	*-.091		**-.147		
Occupation:					
no work					
ag/traditional work					
domestic	**.153	*.129			
modern work	**-.117	*-.119	**-.138		
Education:					
Government					
Koranic		**.179	***.228		**.145
Madressa		**.162			
					*-.107

'perceived illness

*sig. level .10 **sig. level .05 ***sig. level .005

specific to Western population. Malians are not accustomed to placing their degree of perceived severity and anxiety on a scale from one to 10, as they were asked to do in the interviews. Moreover, Malians may define severity of an illness more in terms of how much it detracts from their work and less by how it makes them feel. It is important, therefore, to ask questions and define answers within appropriate cultural parameters. In the original model, the *distance/time a respondent travels* to reach the government health facility predicts anxiety and perceived severity. However, the findings indicate that it is directly correlated with purchasing behavior, as well as with higher levels of perceived severity. That a person travels a further distance/time to seek health care suggests that s/he perceive the illness to be severe enough to warrant the trip seek treatment. Because the measurement of perceived severity may not be accurate for this environment, it is travel distance/time that emerges as a stronger predictor of purchasing behavior.

Malaria (perceived nature of the illness) is also correlated with purchasing behavior (Table 3). Female patients who perceive themselves to have malaria are likely to purchase the prescribed medications. What is striking about this finding is that malaria is not correlated with higher levels of severity or anxiety, as the model predicts.

Malaria is actually associated with lower levels of

anxiety (Table 3). Malaria is common in Sansanding and there is effective treatment available. While people understand that malaria needs to be treated, they do not become anxious or perceive it to be serious because it is easily cured.

Female patients who perceive themselves to have malaria report having fewer resources available to them. However, they possess larger sums of money with which to purchase the medications. If a person has money, s/he does not need to search for additional means of payment. The money itself is sufficient. Thus, her/his number of resources remains at one. It is interesting that respondents seeking malaria treatment generally have cash. As mentioned earlier, malaria is a serious but common illness. Most Malians understand the importance of seeking treatment. They also know what that treatment entails: a series of three intramuscular injections of quinine. Many respondents have presumably purchased this medication previously. Because people they know malaria must be treated and its allopathic treatment is effective, they are financially prepared upon seeking government medical help.

Older patients (*age*) are significant indicators of perceiving the illness as malaria (beta = .094, $P < .05$) (Table 4). This is confusing. Half the female patients seeking health care for malaria are younger than 15 years of age and half are older. There does not appear to be a bias

Table 4. Effects of Mediating and Independent Variables on Purchasing Behavior for Female Patients (regression of mediating variables on predictor variables)

	Perceived Severity (n=200)	Anxiety' (n=200)	Malaria' (n=200)	Digestive' (n=200)	Musculoskeletal' (n=200)
Perceived Nature:					
malaria	o	o	x	x	x
digestive	o	o	x	x	x
eyes & ears	o	o	x	x	x
musculoskeletal	o	o	x	x	x
respiratory	o	o	x	x	x
skin	o	o	x	x	x
fem reproduction	o	o	x	x	x
Number of Resources	x	o	x	x	x
Monthly Earnings	x	o	x	x	x
Money Possessed	x	o	x	x	x
Whorec = Whopay	x	o	x	x	x
Price of Medications	x	o	x	x	x
Work Inability	***.516	***.520	x	x	x
Duration of Illness	o	o	x	x	x
Travel Time/Distance	o	o	x	x	x
Patient Age	**.261	o	**.094	*.131	o
Patient Gender	o	o	o	o	o
Marital Status	o	o	o	o	o
Occupation:					
no work	*-.197	o	o	o	**-.156
ag/traditional work	o	o	o	o	o
domestic	o	o	o	o	o
modern work	o	o	o	o	*-.152
Education:					
Government	**-.209	o	o	o	o
Madressa	o	o	**.155	o	o
Koranic	o	o	o	o	o
R-Square	.403	.360	.062	.038	.058

o = in regression equation but insignificant x = not in regression equation

'perceived illness

*sig. level .10 **sig, level .05 *** sig. level .005

Table 4. (continued)

	Skin-Related' (n=200)	Female Reproduction' (n=200)	Respiratory' (n=200)	Eyes/Ears' (n=200)	Perceived Efficacy of Medications (n=200)
Perceived Nature:					
malaria	x	x	x	x	o
digestive	x	x	x	x	o
eyes & ears	x	x	x	x	o
musculoskeletal	x	x	x	x	*.138
respiratory	x	x	x	x	o
skin	x	x	x	x	o
fem reproduction	x	x	x	x	**-.154
Number of Resources	x	x	x	x	x
Monthly Earnings	x	x	x	x	x
Money Possessed	x	x	x	x	x
Whorec = Whopay	x	x	x	x	x
Price of Medications	x	x	x	x	x
Work Inability	x	x	x	x	x
Duration of Illness	x	x	x	x	x
Travel Time/Distance	x	x	x	x	x
Patient Age	**-.171	**.164	o	o	o
Patient Gender	o	o	o	o	o
Marital Status	o	o	o	o	***-242
Occupation:					
no work	o	o	o	o	o
ag/traditional work	o	o	o	o	o
domestic	o	o	o	o	o
modern work	o	o	o	o	o
Education:					
Government	o	o	o	o	o
Madressa	o	o	o	o	o
Koranic	o	o	o	o	o
R-Square	.056	.040	.024	.017	.167

o = in regression equation but insignificant x = not in regression equation

'perceived illness

*sig. level .10 **sig, level .05 *** sig. level .005

Table 4. (continued)

	Number of Resources (n=200)	Monthly Earnings (n=200)	Money Possessed (n=200)	Whorec = Whopay (n=200)
Perceived Nature:				
malaria	x	x	x	x
digestive	x	x	x	x
eyes & ears	x	x	x	x
musculoskeletal	x	x	x	x
respiratory	x	x	x	x
skin	x	x	x	x
fem reproduction	x	x	x	x
Number of Resources	x	x	x	x
Monthly Earnings	x	x	x	x
Money Possessed	x	x	x	x
Whorec = Whopay	x	x	x	x
Price of Medications	x	x	x	x
Work Inability	x	x	x	x
Duration of Illness	x	x	x	x
Travel Time/Distance	x	x	x	x
Patient Age	o	o	o	o
Patient Gender	o	o	o	o
Marital Status	o	o	o	o
Occupation:				
no work	o	o	o	o
ag/traditional work	*.141	*.156	o	o
domestic	*-.162	o	o	o
modern work	o	o	o	o
Education:				
Government	o	*.173	**.198	o
Madressa	o	o	o	o
Koranic	o	**.215	o	o
R-Square	.041	.107	.083	.020

o = in regression equation but insignificant x = not in regression equation

'perceived illness

*sig. level .10 **sig, level .05 *** sig. level .005

toward older patients. This finding requires further investigation.

In addition to age, people with more years of Madressa schooling tend to perceive themselves as having malaria (beta = .155, $P < .05$). This suggests that students of the Madressa system learn about malaria and readily ascribe their symptoms to this illness. Another explanation is that those who have studied or are studying in this education system are in occupations or live lifestyles which expose them to malaria-infected mosquitoes. Moreover, female patients who have higher levels of government or Koranic educations have greater monthly incomes. It is feasible that these patients are able to afford mosquito netting which offers them some protection from this disease. Females with Madressa educations may not be able to afford this luxury. The question of how these education systems affect health and socioeconomic status in rural Mali requires further investigation.

Women with *female reproductive* illnesses carry less cash, travel further distances to reach the health facilities, and have higher levels of anxiety due to their illness. Despite this, they are less likely to purchase the medications. These women have very little confidence in government medicine for these illnesses. Malians often view reproductive problems as having supernatural causes [1]. Visiting a government health facility may be the last resort

for many of these women. Moreover, the average female patient with reproductive illnesses arrives at the government health facility with 900 FCFA (around $3.00 to $4.00 U.S.). The average price of medicine for these illnesses is more than double what these women possess (1,834 FCFA). This combination of lack of funds and low levels of confidence in the medications prevent women from purchasing government medicine for reproductive illnesses.

Higher levels of *anxiety* are also associated with purchasing the prescribed medications (Table 3). As predicted by the original model, illnesses of longer duration are significantly correlated with higher levels of anxiety. In this population, older patients are also associated with higher levels of anxiety. While I predicted the opposite to be true, this may be based on a Western bias. In the United States, young children are revered, while the elderly population is often forgotten. Decisions at both local political and household levels are rarely made without first consulting and receiving the approval of the elders in the town or family unit. Elderly women are powerful actors in Malian society. Younger members of the community and family unit know the wisdom these women possess. Moreover, women beyond menopause are from social and physical pressures and constraints with which they were faced during their child-bearing years. When an older member of the community or family is ill, the illness is

associated with greater anxiety.

Female patients with higher levels of government educations have lower levels of anxiety. That they also perceive government medications to be efficacious helps explain this phenomenon. Those who attend government schools have greater confidence in government medicine because they are exposed to the allopathic medical model on which government medicine is based. Thus, they are less anxious about their illness because they are confident that they can be cured at a government health facility. Female patients who have greater *monthly earnings* are also less anxious than those with smaller earnings. If a female earns enough money to purchase the prescribed medications, then she is less anxious about paying for those medications.

What is surprising is that patients who reported having multiple resources (*number of resources*) with which to pay for the prescribed medications have greater levels of anxiety. I expected these patients to be more confident in their ability to pay. However, a respondent who must rely on someone else to provide funds is more anxious than someone who can pay for the medicine themselves. This suggests that the network of family and friends on which people depend are not always dependable. It is also surprising that there is no correlation between the "*whorec=whopay*" variable and purchasing behavior or anxiety level. This variable, like number of resources, measures

the social and financial network which influences purchasing behavior. That this was not a significant factor indicates that there is either a error in the measurement, there is no social network, or that people seeking government health care in Sansanding do not, or cannot, rely on such a network. This question requires further investigation.

The *amount of money a respondent possessed* to pay for the prescribed medications has a positive correlation with purchasing behavior (Table 3). The more money a person possesses, the greater the likelihood that they will purchase the medications. Government education was the single significant predictor of money possessed (beta = .198, $P < .05$). As the model predicted, respondents with higher levels of government education have higher monthly earnings and greater amounts of cash. Civil servants have all attended government schools and earn monthly salaries. This gives them increased access to cash.

Patients in *domestic* and *agricultural/traditional occupations* had less cash at the time of the interview. This implies that these workers earn less money or have greater monthly expenditures, such feeding a large family, which depletes their income.

Patients with more chronic, long-term illnesses (*duration of illness*) also have less cash available with which to purchase the prescribed medications. It is possible that these patients have depleted much of their

resources on traditional or Islamic treatment prior to seeking government health care. The interviewers asked respondents if they had visited other healers prior to visiting the government health facilities. I hoped to assess what other sources people access and how much they spend on such treatment. However, respondents underreported these activities and I was unable to use that information in this analysis.

Female patients with greater monthly earnings have more cash available for purchasing medications. Those who reported several resources as means for paying for the medications have less cash available. This suggests that if a person has money, they do not need to search for additional means of payment. The cash itself is sufficient. However, if they do not have cash available, they must look for other means. If a patient is not sure about the means of payment she will report several possibilities. This does not guarantee that she will purchase the medications, however.

Finally, married women are less likely than unmarried women to have cash available. Married women have greater household responsibilities, such as caring for children and other family members in the compound. These women have greater expenditures but less time to make money. Thus, they have smaller amounts of cash to spend on medications.

Male Patients

The mediating and independent variables explain less variance of purchasing behavior for male than female patients. The mediating variables only explain 7% of the variance. The combined mediating and independent variables explain 20.1% of the variance (Table 5). This indicates two points. The first is that the independent variables have a direct impact on purchasing behavior. They are not filtered through the mediating variables.

Second, the low variance explained suggests that there are additional variables which explain purchasing behavior for male patients that are not in the model. For this analysis, I look at how what is in the model explains the 20% of variance of purchasing behavior.

A total of 152 male patients was included in the analysis. There is no one significant indicator of purchasing behavior for male patients (Table 5). This may be due to the colinearity between the variables *malaria* and *musculoskeletal*, *malaria* and *marital status*, and *marital status* and *musculoskeletal* (see Table 6).

As with female patients, *malaria* in the male population correlates with purchasing behavior. However, male patients with the perception of having malaria are less likely to purchase the prescribed medications. This finding is particularly surprising because the perceived nature of malaria is associated with a high level of confidence in

Table 5. Effects of Mediating and Independent Variables on Purchasing Behavior for Male Patients (regression of dependent variable on predictor variables)

	Mediating (n=152)	Independent (n=152)	Mediating & Independent (n=152)
Perceived Efficacy	o	x	o
Perceived Severity	o	x	o
Anxiety	o	x	o
Perceived Nature:			
malaria	o	x	o
digestive	o	x	o
eyes & ears	o	x	o
musculoskeletal	o	x	o
respiratory	o	x	o
skin	o	x	o
fem reproduction	x	x	o
Number of Resources	o	x	o
Monthly Earnings	o	x	o
Money Possessed	o	x	o
Whorec = Whopay	o	x	o
Price of Medications	o	x	o
Work Inability	x	o	o
Duration of Illness	x	o	o
Travel Time/Distance	x	o	o
Patient Age	x	o	o
Patient Gender	x	o	o
Marital Status	x	o	o
Occupation:			
no work	x	o	o
ag/traditional work	x	o	o
housework	x	o	o
modern work	x	o	o
Education:			
Government	x	o	o
Madressa	x	o	o
Koranic	x	o	o
R-Square	.070	0.097	0.201

o = in regression equation but insignificant

x = not in regresion equation

*sig. level .10 **sig, level .05 *** sig. level .005

Table 6. Effects of Mediating and Independent Variables on Purchasing Behavior for Male Patients (regression of mediating variables on predictor variables)

	Perceived Severity (n=152)	Anxiety (n=152)	Malaria' (n=152)	Digestive' (n=152)	Musculoskeletal' (n=152)
Perceived Nature:					
malaria	o	o	x	x	x
digestive	o	o	x	x	x
eyes & ears	o	o	x	x	x
musculoskeletal	o	o	x	x	x
respiratory	o	o	x	x	x
skin	o	o	x	x	x
fem reproduction	o	o	x	x	x
Number of Resources	x	o	x	x	x
Monthly Earnings	x	o	x	x	x
Money Possessed	x	o	x	x	x
Whorec = Whopay	x	o	x	x	x
Price of Medications					
Work Inability	***.574	**.540	x	x	x
Duration of Illness	o	o	x	x	x
Travel Time/Distance	o	o	x	x	x
Patient Age	o	o	o	o	o
Patient Gender	o	o	o	o	o
Marital Status	o	o	o	o	o
Occupation:					
no work	o	o	o	o	o
ag/traditional work	o	o	*-.211	o	o
domestic	o	o	*.190	o	o
modern work	o	o	o	o	o
Education:	o	o	o	o	o
Government	o	o	o	o	o
Madressa	o	o	o	o	o
Koranic	o	o	o	o	o
R-Square	.364	.389	.051	.032	.080

o = in regression equation but insignificant x = not in regression equation

'perceived illness

*sig. level .10 **sig, level .05 *** sig. level .005

Table 6. (continued)

	Skin-Related' (n=152)	Female Reproduction' (n=152)	Respiratory' (n=152)	Eyes/Ears' (n=152)	Perceived Efficacy of Medications (n=152)
Perceived Nature:					
malaria	x	x	x	x	o
digestive	x	x	x	x	o
eyes & ears	x	x	x	x	o
musculoskeletal	x	x	x	x	o
respiratory	x	x	x	x	*-.172
skin	x	x	x	x	o
fem reproduction	x	x	x	x	o
Number of Resources	x	x	x	x	x
Monthly Earnings	x	x	x	x	x
Money Possessed	x	x	x	x	x
Whorec = Whopay	x	x	x	x	x
Price of Medications					
Work Inability	x	x	x	x	x
Duration of Illness	x	x	x	x	x
Travel Time/Distance	x	x	x	x	x
Patient Age	o	o	o	o	*.191
Patient Gender	o	o	o	o	o
Marital Status	o	o	o	o	o
Occupation:					
no work	o	o	o	o	o
ag/traditional work	o	o	o	o	o
domestic	o	o	o	o	o
modern work	o	o	o	**.235	o
Education:	o	o	o	o	o
Government	o	o	o	o	o
Madressa	o	o	o	o	o
Koranic	o	o	o	o	o
R-Square	.028		.020	.078	.128

o = in regression equation but insignificant x = not in regression equation

'perceived illness

*sig. level .10 **sig, level .05 *** sig. level .005

Table 6. (continued)

	Number of Resources (n=152)	Monthly Earnings (n=152)	Money Possessed (n=152)	Whorec = Whopay (n=152)
Perceived Nature:				
malaria	x	x	x	x
digestive	x	x	x	x
eyes & ears	x	x	x	x
musculoskeletal	x	x	x	x
respiratory	x	x	x	x
skin	x	x	x	x
fem reproduction	x	x	x	x
Number of Resources	x	x	x	x
Monthly Earnings	x	x	x	x
Money Possessed	x	x	x	x
Whorec = Whopay	x	x	x	x
Price of Medications				
Work Inability	x	x	x	x
Duration of Illness	x	x	x	x
Travel Time/Distance	x	x	x	x
Patient Age	o	o	o	o
Patient Gender	o	o	o	o
Marital Status	o	o	*.168	o
Occupation:				
no work	o	o	o	o
ag/traditional work	o	*.252	o	o
domestic	o	*-.224	o	o
modern work	*-.184	o	o	o
Education:	o	o	o	o
Government	o	**.281	o	o
Madressa	o	o	o	o
Koranic	o	***.319	o	o
R-Square	.032	.280	.098	.029

o = in regression equation but insignificant x = not in regression equation

'perceived illness

*sig. level .10 **sig, level .05 *** sig. level .005

government medicine. Moreover, male patients with malaria have more chronic cases of the disease and were recommended to the facility by the person who said they would pay for the prescribed medications. These findings contradict the model which states that patients with illnesses of longer duration and who have a more guaranteed financial source will purchase the medications.

Occupation is a significant indicator of perceiving the illness as malaria (Table 7). Male patients with the perception of having malaria are less likely to be in agricultural/traditional occupations (beta = -.211, $P < .10$) and more likely to be in domestic occupations (beta = .190, $P < .10$) (Table 7). Similar to the female population, agricultural workers have greater monthly earnings than domestic workers. Domestic workers are less able to afford the necessary items which protect (e.g. mosquito nets) them from contracting malaria.

Male patients with the perception of having *musculoskeletal* illnesses are less likely to purchase the prescribed medications. This finding is as surprising as the previous finding with malaria. Patients who perceived themselves to have a musculoskeletal illness are associated with high levels of perceived severity and anxiety. Moreover, they have more chronic cases of this illness, and they are unable to work due to their illness. According to the model, these variables predict positive purchasing

Table 7. Effects of Mediating and Independent Variables on Purchasing Behavior for Male Patients (regression of mediating variables on predictor variables)

	Perceived Severity (n=152)	Anxiety (n=152)	Malaria' (n=152)	Digestive' (n=152)	Musculoskeletal' (n=152)
Perceived Nature:					
malaria	o	o	x	x	x
digestive	o	o	x	x	x
eyes & ears	o	o	x	x	x
musculoskeletal	o	o	x	x	x
respiratory	o	o	x	x	x
skin	o	o	x	x	x
fem reproduction	o	o	x	x	x
Number of Resources	x	o	x	x	x
Monthly Earnings	x	o	x	x	x
Money Possessed	x	o	x	x	x
Whorec = Whopay	x	o	x	x	x
Price of Medications					
Work Inability	***.574	**.540	x	x	x
Duration of Illness	o	o	x	x	x
Travel Time/Distance	o	o	x	x	x
Patient Age	o	o	o	o	o
Patient Gender	o	o	o	o	o
Marital Status	o	o	o	o	o
Occupation:					
no work	o	o	o	o	o
ag/traditional work	o	o	*-.211	o	o
domestic	o	o	*.190	o	o
modern work	o	o	o	o	o
Education:	o	o	o	o	o
Government	o	o	o	o	o
Madressa	o	o	o	o	o
Koranic	o	o	o	o	o
R-Square	.364	.389	.051	.032	.080

o = in regression equation but insignificant x = not in regression equation

'perceived illness

*sig. level .10 **sig, level .05 *** sig. level .005

Table 7. (continued)

	Skin-Related' (n=152)	Female Reproduction' (n=152)	Respiratory' (n=152)	Eyes/Ears' (n=152)	Perceived Efficacy of Medications (n=152)
Perceived Nature:					
malaria	x	x	x	x	o
digestive	x	x	x	x	o
eyes & ears	x	x	x	x	o
musculoskeletal	x	x	x	x	o
respiratory	x	x	x	x	*-.172
skin	x	x	x	x	o
fem reproduction	x	x	x	x	o
Number of Resources	x	x	x	x	x
Monthly Earnings	x	x	x	x	x
Money Possessed	x	x	x	x	x
Whorec = Whopay	x	x	x	x	x
Price of Medications					
Work Inability	x	x	x	x	x
Duration of Illness	x	x	x	x	x
Travel Time/Distance	x	x	x	x	x
Patient Age	o	o	o	o	*.191
Patient Gender	o	o	o	o	o
Marital Status	o	o	o	o	o
Occupation:					
no work	o	o	o	o	o
ag/traditional work	o	o	o	o	o
domestic	o	o	o	o	o
modern work	o	o	o	**.235	o
Education:	o	o	o	o	o
Government	o	o	o	o	o
Madressa	o	o	o	o	o
Koranic	o	o	o	o	o
R-Square	.028		.020	.078	.128

o = in regression equation but insignificant x = not in regression equation

'perceived illness

*sig. level .10 **sig, level .05 *** sig. level .005

Table 7. (continued)

	Number of Resources (n=152)	Monthly Earnings (n=152)	Money Possessed (n=152)	Whorec = Whopay (n=152)
Perceived Nature:				
malaria	x	x	x	x
digestive	x	x	x	x
eyes & ears	x	x	x	x
musculoskeletal	x	x	x	x
respiratory	x	x	x	x
skin	x	x	x	x
fem reproduction	x	x	x	x
Number of Resources	x	x	x	x
Monthly Earnings	x	x	x	x
Money Possessed	x	x	x	x
Whorec = Whopay	x	x	x	x
Price of Medications				
Work Inability	x	x	x	x
Duration of Illness	x	x	x	x
Travel Time/Distance	x	x	x	x
Patient Age	o	o	o	o
Patient Gender	o	o	o	o
Marital Status	o	o	*.168	o
Occupation:				
no work	o	o	o	o
ag/traditional work	o	*.252	o	o
domestic	o	*-.224	o	o
modern work	*-.184	o	o	o
Education:	o	o	o	o
Government	o	**.281	o	o
Madressa	o	o	o	o
Koranic	o	***.319	o	o
R-Square	.032	.280	.098	.029

o = in regression equation but insignificant x = not in regression equation

'perceived illness

*sig. level .10 **sig, level .05 *** sig. level .005

behavior. The findings challenge the theoretical model. However, as discussed earlier, gender influences the perceived nature of an illness. Fosu [17] found that men perceive their illnesses as having more supernatural causes. If the male patients in this study perceive the cause of their illness to be supernatural, then they would not expect government medicine to cure their maladies. Moreover, they would not purchase the prescribed medications. Their beliefs would override the strength of their anxiety and perceived severity associated with the illness. However, the case of malaria, where male patients do perceive the medications to be efficacious, remains unexplained.

As with female patients, male patients who *possessed money* when they visit government facilities have a fewer number of resources, but greater monthly earnings. Marital status is the soul significant indicator (beta = .168, $P < .10$) of having cash for purchasing medications. This suggests that married men have greater access to cash, although there is no significant correlation between marital status and monthly earnings.[11] However, married men may be

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11. The measurement of monthly earnings may be faulty. Many people are unwilling to disclose the amount of money they earn. Moreover, calculating earnings is not common in Sansanding. For many respondents, especially for women, this was a foreign concept. They would respond that it really depends on the day, week, or even the season. Women reported that some weeks they make a lot of money. Others, they make none. Men generally tried to give more decisive answers, but the precision and truth of their disclosure is questionable.

able to access cash from their wives. Moreover, patients who have cash with which to purchase the medications tend to be older (Table 6). These married and older men are more respected and trusted within their community. Friends, family members, and creditors trust that they will be repaid and are, therefore, willing to lend the patient the necessary funds.

Marital status also correlates directly with purchasing behavior. Without further investigation, however, I am uncomfortable assuming that marital status directly impacts the purchasing of prescribed medications. I posit that marital status predicts whether or not a male patient has cash to take to the pharmacy. The presence of this cash predicts if the medications will be purchased.

Occupation and *education* also influence whether or not a male patient possesses money with which to pay for pharmaceuticals. As with female patients, male patients who are domestic workers have less cash. Male patients in modern occupations have more cash. This corresponds with the model. People in modern occupations, such as civil servants, traders, and veterinarians, all make steady incomes. Therefore, they have more cash available to them.

Male patients had more years of government and Koranic schooling. The higher level of government education explains the modern occupations for male patients. Without attending government schools, Malians cannot become civil

servants. Higher levels of Koranic education is significantly correlated with higher monthly earnings. This explains why these patients have more cash available with which to purchase the prescribed medications.

An additional finding is that male patients who do not work (*no work*) are less likely to purchase the prescribed medications. There are two interrelated explanations for this. The first is that people who do not work do not have money. Without cash, it is difficult to purchase pharmaceuticals. Second, having no work was negatively correlated with "*whorec=whopay*." A patient who does not work also does not have the person who recommended him to the facility paying for his medications. The patient who does work is correlated with the person who recommended him to the facility paying for the prescribed medications. For the non-working patient, not only does the patient not earn an income, but he also does not have the guarantee that someone will cover the costs of medications. For the patient who does work, not only does he have access to cash through his work, but he also knows that the person who recommended him to come to the facility will pay for the pharmaceuticals.

The final finding is that male patients with more years of *Madressa* education are correlated with purchasing the prescribed medications. Those with more years of Madressa schooling also have a high level of confidence in government

pharmaceuticals. As with marital status, the actual causal relationship is unclear. I am not confident in reporting that Madressa education is a mediating variable that is influenced by the patient's perceived efficacy of the medications. This finding disputes my hypothesis that the opposite is true. Further investigation is needed to fully understand this relationship.

DISCUSSION

This thesis examined purchasing behavior in rural Mali. By disaggregating the data by gender, different patterns in purchasing behavior have emerged. The significant findings (> .01) show five main characteristics of female purchasing of prescribed government pharmaceuticals: 1) Females who are unable to work during their illness episode are more likely to purchase the medications. Both girls and women have many household and agricultural responsibilities. It is important that they recover quickly from an illness and in order to rejoin the work force, 2) the further distance or longer time a female patient travels to the health facility, the more likely she is to purchase the medications, 3) females with self-diagnosed malaria are more likely to purchase the prescribed medications. The lower anxiety levels of females with self-diagnosed malaria probably stems from their familiarity with the disease. This familiarity, in all likelihood, explains why they have more cash available with which to purchase the medications. Older women and women with more years of Madressa education are more likely to diagnosis themselves with malaria, 4) women with self-diagnosed reproductive illnesses are less

likely to purchase the prescribed medications. This is because they have little confidence in the efficacy of government pharmaceuticals for their illness and have less cash available with which to purchase the medications, and 5) females with more cash available are more likely to purchase the prescribed medications. Female patients with government education and greater monthly earnings have more cash available to them. Married women and female patients with longer-term illnesses and domestic or agricultural/traditional occupations have less cash available to them.

The six significant (> .01) main characteristics of male purchasing of prescribed government pharmaceuticals differ from those of females: 1) Male patients with self-diagnosed malaria are less likely to purchase the prescribed medications. This is true despite higher levels of confidence in government pharmaceuticals and a guaranteed funding source, 2) male patients with self-diagnosed musculoskeletal ailments are also less likely to purchase the prescribed medications. This is true despite higher levels of perceived severity and anxiety about their illness and an inability to work due to their illness, 3) males who have more cash available are more likely to purchase the medications. These men are generally married and work in more modern occupations, 4) married men are more likely to purchase the prescribed medications. This is because they

have more cash available to them, 5) males who do not work are less likely to purchase the prescribed medications. These patients have less guaranteed financial means, and 6) males who have more years of Madressa education are more likely to purchase the medications.

Findings such as these point to important policy implications. They make clear the need to focus on distinct populations, instead of on just the aggregate group. By understanding purchasing behavior, policy makers can incorporate the specific needs of particular age and gender groups in order to provide appropriate, accessible, and effective health care.

This research also supports the notion that women's health issues, particularly those which are reproductive in nature, cannot effectively be addressed if they are not separated from the health needs of the larger population. Malian culture emphasizes the woman's role as biological reproducer. Men often marry up to four wives in order to increase their wealth of children. A woman unable to bear children often perceives herself as inadequate to meet her societal and familial responsibilities. This leaves her depressed and often jealous of a co-wife's status as child-bearer in her husband's family. It is no wonder that a woman who believes herself to have an ailment associated with her reproductive abilities will seek medical help.

Women were found to have high levels of anxiety and

perceived severity associated with reproductive illness. However, they do not purchase the prescribed medications because they have little confidence that the medicine would help in cure their illness. It is true that women often perceive reproductive problems to be associated with supernatural causes [1]. They have most likely sought care from other sources. As researchers and development workers, we need to understand and respect the beliefs surrounding the etiology of reproductive problems in order to incorporate them into government treatment strategies. In addition, attention must also be paid to the fact that society puts such pressures on women to reproduce. This focus alone would help reduce the amount of high-risk pregnancies that initially leads a woman to a health facility.

While this study examined the data stratified by gender, it failed to examine the data by age and by age *by* gender. Future analysis needs to address these different groups. For example, I did not distinguish between newborn girls and women of childbearing years. Moreover, I did not distinguish between boys and girls within these different age groups. Based on past research [19-22] and the research presented in this study, it is more than probable that differences exist between these groups. This study failed to make this distinction for two reasons. First, there are many angles one can take to analyze this data. I chose to

give a broader overview of the population. Secondly, the data base was not large enough to conduct a statistical analysis for age by gender categories. However, I recognize the value of and need for examining the data from different perspectives.

This research contributes to the existing literature by revealing important influences on purchasing behavior of government pharmaceuticals in Mali. It uses a social-psychological model which offers a foundation from which to examine important health seeking behavior. However, the methodological and theoretical approaches used have their limitations.

The methodology used for this analysis specifically examines people who are seeking help at government health facilities. It does not examine those who have chosen to seek non-government care or no care at all. In addition, by using a purely statistical analysis, the texture and nuances of life in Sansanding has escaped this study. By neglecting to conduct qualitative field research, questions brought forth by the data remain answered. Such questions include the necessity for understanding the nature of the different education systems, health care responsibilities within the household, and the informal network of accessing resources from friends and family members.

While the social-psychological model gives insight into purchasing behavior, it does not address larger issues of

social structure and political economy. This research did not examine, for example, how government health policy affects health care delivery systems or pharmaceutical pricing. Nor has it examined the larger question of how international development organizations, such as the World Bank and UNICEF, influence national health care systems. The connection between international/national programs and policies and purchasing behavior demands investigation.

The research conducted for and results discussed in this thesis offer a strong foundation for further research in this area. The findings suggest that social psychological models partially explain purchasing behavior for different populations. While such models have their limitations, this research has shown that factors such as need (measured by the respondent's perceived severity and anxiety), perceived efficacy of the prescribed medication, means, perceived nature of an illness, accessibility, the respondent's occupation, education, and marital status, and the patient's age and gender all help to explain purchasing behavior in a West African town. It is now the task of social scientists, both African and of international origin, to uncover the variables that remain unexplored.

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